ONTARIO DEPARTMENT OF MINES
AND NORTHERN AFFAIRS

ANNUAL REPORT

OF

RESIDENT GEOLOGISTS' SECTION

GEOLOGICAL BRANCH

1970

Edited by

G.R.Guillet

MISCELLANEOUS PAPER 46

MARCH, 1971

Publications of the Ontario Department of Mines and Northern Affairs

and price list

are obtainable through the

Publications Office, Ontario Department of Mines and Northern Affairs,

Parliament Buildings, Queen's Park,

Toronto, Ontario, Canada.

Orders for publications should be accompanied by cheque, or money order, payable to Treasurer of Ontario. Stamps are not acceptable.

PREFACE

The 1970 Annual Report of the Resident Geologists' Section is primarily an account of mining and exploration activity in Ontario during 1970. Formerly published in four parts, the reports from each of the eight offices have been combined this year into a single volume.

Resident Geologists are located in eight mining centres: Kenora, Kirkland Lake, Red Lake, Sault Ste. Marie, Sudbury, Thunder Bay, Timmins, and Toronto. These locations coincide with those of the Mining Recorders, except for an additional Recording office at Sioux Lookout. The Sioux Lookout area is shared by Resident Geologists at Kenora and Red Lake. The accompanying map shows the area for which each Resident Geologist is responsible.

The Resident Geologist is primarily concerned with collecting and disseminating information on the geology and mineral resources of his district. He maintains a library of published and unpublished reports from various sources, including work reports submitted for assessment credit, company prospectuses and reports from the files of the Ontario Securities Commission, reports of property visits by government geologists, reports donated by companies and individuals, and various new items. These are available for public examination. Duplicate copies of assessment work for the whole province may also be examined in the Assessment Work Library, Room 1606 of the Whitney Block, Parliament Buildings, Toronto.

This report gives an account of the year's activities in each Resident Geologist's office, and summarizes the highlights of the mineral industry in each district.

G.R. Guillet,
Chief, Resident Geologists' Section

DISTRICT	RESIDENT GEOLOGIST	ADDRESS	TEL. NO.
RED LAKE	R. A. Riley	ONTARIO GOVT. BLDG.	819
KENORA	H. L. KING	808 ROBERTSON ST.	468 – 9085
THUNDER BAY	C. R. Kustra	179 S. ALGOMA ST.	345 – 1438
SAULT STE. MARIE	R. J. Rupert	370 LAKE ST.	254 – 1791
SUDBURY	D. G. Innes (Assistant)	1349 LA SALLE BLVD.	566 – 2580
TIMMINS	E. G. Bright	60 WILSON AVE.	264 – 4262
KIRKLAND LAKE	H. L. Lovell	4 GOVERNMENT RD. E.	567 – 5242
SOUTHERN ONTARIO	G. R. Guillet	PARLIAMENT BLDGS. TORONTO	365 – 1675

LOCATION OF RESIDENT GEOLOGISTS' DISTRICTS

GEOLOGICAL BRANCH

ONTARIO DEPARTMENT OF MINES AND NORTHERN AFFAIRS

Revised to January, 1971

ODMNA 4715

CONTENTS

KENORA DISTRICT

By

H.L. King

CONTENTS

Kenora District

Tables

Figures

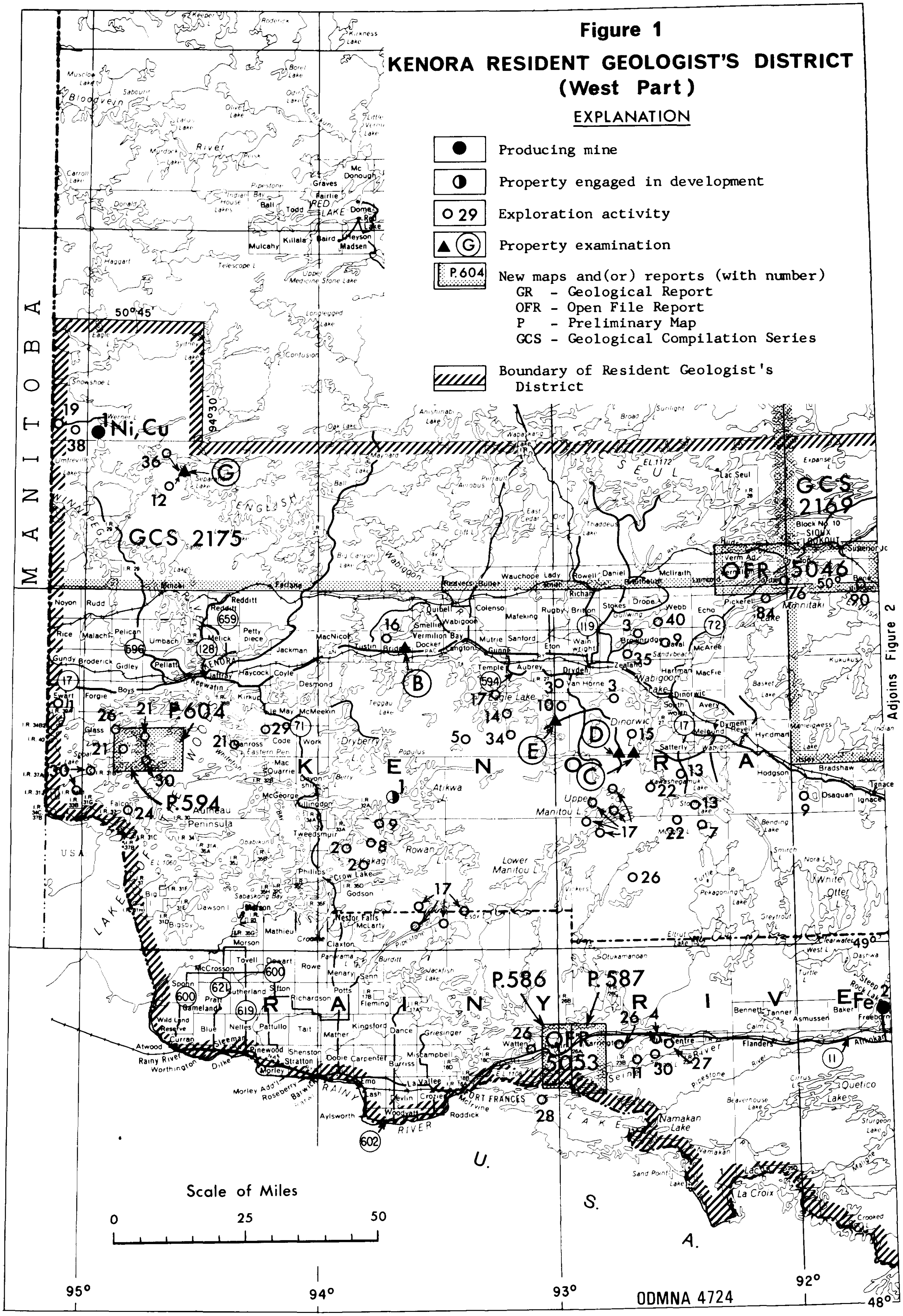
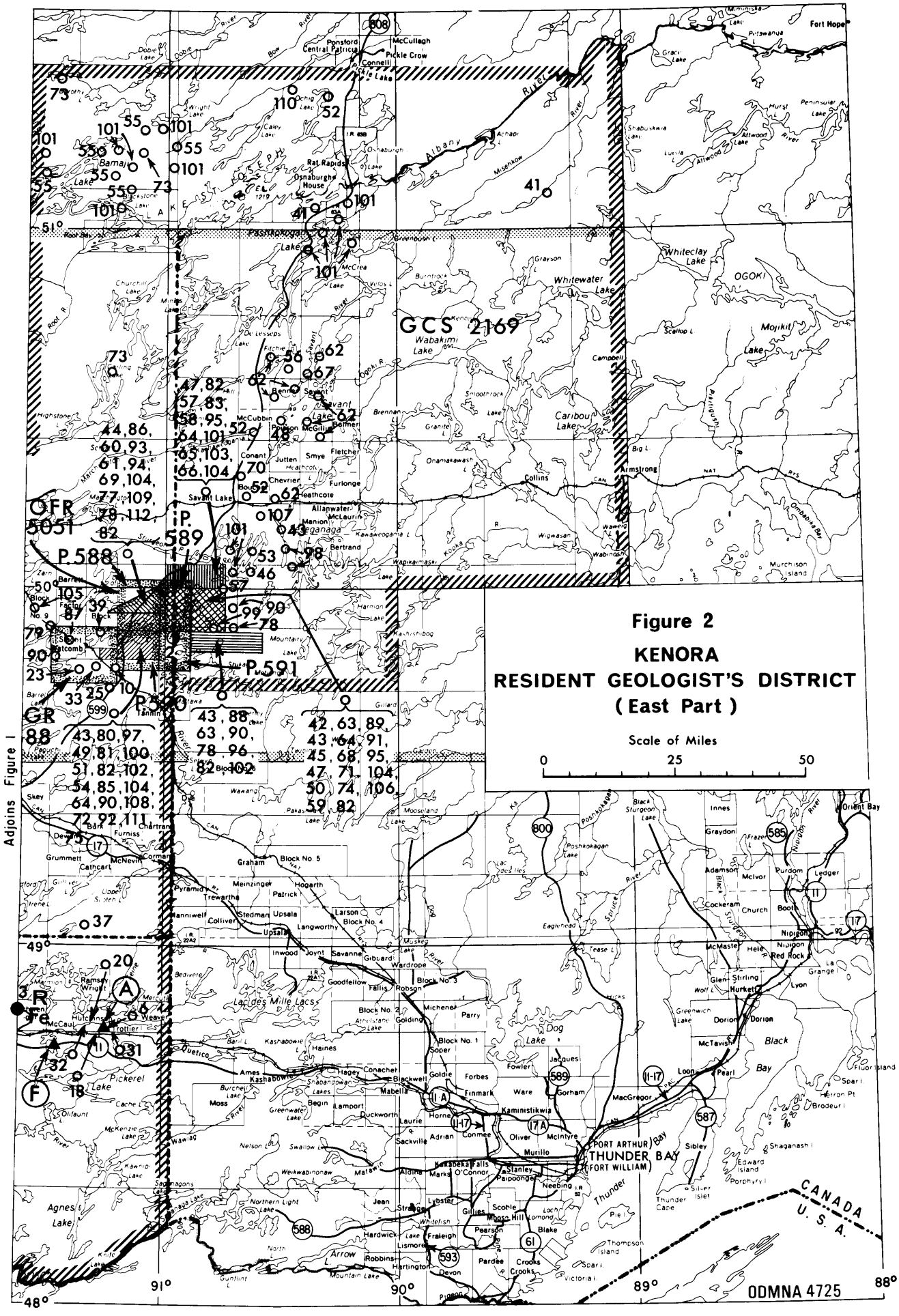

EXPLANATION
Producing mine
Property engaged in development
O 29 Exploration activity
▲ (G) Property examination
P.604 New maps and(or) reports (with number)
GR - Geological Report
OFR - Open File Report
P - Preliminary Map
GCS - Geological Compilation Series
Boundary of Resident Geologist's District
MANITOBA
GCS 2175
GCS 2169
OFR 5046
P.604
P.594
P.586
P.587
OFR 5053
Ni, Cu
Fe
KENORA
RAINY RIVER
Adjoins Figure 2
U.S.A.
Scale of Miles
0 25 50
95°
94°
93°
92°
49°
48°
50°45'
94°30'
ODMNA 4724

Figure 1

KENORA RESIDENT GEOLOGIST'S DISTRICT (West Part)


Adjoins Figure 1
GCS 2169
GFR 5051
P. 588
P. 589
P. 591
GR 88
Figure 2
KENORA
RESIDENT GEOLOGIST'S DISTRICT
(East Part)
Scale of Miles
0
25
50
THUNDER BAY
(FORT WILLIAM)
PORT ARTHUR
CANADA
U. S. A.
ODMNA 4725

INDEX TO FIGURES 1 AND 2

Producing Mines

1. Consolidated Canadian Faraday Ltd. ..... Nickel, copper
2. Steep Rock Iron Mines Ltd. ..... Iron
3. Caland Ore Company Ltd. ..... Iron

Properties Engaged in Development

1. Maybrun Mines Ltd. ..... Copper
2. Mattabi Mines Ltd. ..... Zinc, copper, silver, lead

Property Examinations

A. Atikokan Iron Mines property
B. Cates property
C. Glatz-Kozowy property
D. Lantz, A. property
E. Nabish Lake property
F. Thew, R. property
G. Tudale property

KENORA DISTRICT

By

H.L. King[1]

INTRODUCTION

A very significant upsurge in mineral exploration took place in the Kenora District during 1970. Exploration efforts again proved successful in the Sturgeon Lake area during the year with the discovery of a second but smaller deposit of zinc, copper, and silver by Mattagami Lake Mines Ltd. and the discovery of a high grade copper, zinc, and silver deposit by Falconbridge Nickel Mines Ltd.

These recent discoveries, which were led by the success of Selco Exploration Co. Ltd. at Confederation Lake in 1968, have rapidly established what appears to be a great base metal potential in northwestern Ontario.

RESIDENT GEOLOGIST'S ACTIVITIES

The sharp increase in exploration activity in northwestern Ontario has resulted in numerous visits to the Kenora office, and a significant amount of the writer's time during the past year was spent in discussions and consultations with exploration people.

In addition to regular duties, several projects are currently being undertaken. Aided by an assistant, Mr. D. Werry, the writer is currently working on a mapping project of the Keewatin-Kenora area. Also in progress is revision of part of the Atikokan-Lakehead Sheet and work on a Lake of the Woods and Rainy River area guidebook.

During the course of the summer a number of showings were examined, brief descriptions of which appear elsewhere in the text. Some time was spent with the two Geological Surveys' field parties located in the Kenora area. Several of the mining operations and properties in various stages of exploration and development were also visited.

With schools currently placing more emphasis on the earth sciences, and in order to help stimulate interest, a number of talks on earth science subjects, some accompanied by field trips, were given during the year. The writer also participated in the mineral exploration classes held at Sioux Lookout in November 1970, conducted by E.B. Freeman, one of the Department's geological lecturers.

Meetings and conventions attended during the year included the annual meetings of the Canadian Institute of Mining and Metallurgy in Toronto, the Institute on Lake Superior Geology held at Thunder Bay, and the annual meeting

---

[1]Resident Geologist, Provincial Building, 808 Robertson St., Kenora.
Manuscript accepted for publication February 9, 1971.

of the Geological Association of Canada in Winnipeg. The writer also participated in a staff field trip sponsored by the Geological Branch of the Department of Mines and Northern Affairs in the Red Lake area.

EXPLORATION AND MINING ACTIVITY

Staking

Kenora Mining Division

Claim staking in the Kenora Mining Division showed more than a two-fold increase in 1970 over the previous year. A total of 4,904 claims were recorded as compared to 2,364 during 1969. The increase was mainly due to a strong interest in exploration for base metals.

The most concentrated areas of staking activity were southwest of Kenora in the Shoal Lake and Western Peninsula areas, and south of Dryden.

Patricia Mining Division

Active staking in the Patricia Mining Division continued throughout the year. In the southern part of the Division, south of Central Patricia and Pickle Crow, most of the claims staked were in the Sioux Lookout to Dryden area, Sioux Lookout to Watcomb area, Savant Lake area, Bamaji Lake area, Kapkichi Lake area, and an area east of Lake St. Joseph.

The Mining Recorder's office at Sioux Lookout reported a slight increase in the number of claims staked this year. A total of 11,659 claims were recorded in the Patricia District in 1970, compared with 11,634 claims in 1969. The Kenora Resident Geologist's district includes only that portion of the Patricia Mining Division lying south of Pickle Crow and a breakdown of the number of claims staked only in this southern part of the Division is not available.

Quarry Permits

A total of 81 quarry permits were issued or renewed for the Kenora district during 1970. Two of these permits were issued for the removal of rock for use as track ballast by the Canadian Pacific Railway and Canadian National Railways. The rest (79) were issued for the removal of sand and gravel from deposits on Crown Lands.

Exploration

Exploration activity in the Kenora district increased significantly for the second consecutive year. Efforts were directed mainly to the search for base metals and virtually every volcanic-sedimentary belt in the district received some attention.

The main centre of interest, however, continues to be the Sturgeon Lake area, where more than 70 companies were active during the year. In November, attention once again focused on the area with the discovery of copper, zinc, and silver, by Falconbridge Nickel Mines Ltd. The new discovery is about 4 miles to the east of last year's major base metal discovery by Mattagami Lake Mines Ltd.

A second base metal discovery made by Mattagami Lake Mines Ltd. in March of 1970, three miles west of the original major find, also created considerable interest.

A discovery by Union Miniere Explorations and Mining Corp. Ltd. of copper and nickel mineralization in the Kapkichi Lake area, just west of Pickle Lake, was announced in December 1970. Drilling is reported to have intersected wide, discontinuous mineralization averaging less than 0.4 percent copper and 0.12 percent nickel.

There were marked increases in the amount of work reported and in the amount of assessment work filed in 1970 compared to 1969. In the Kenora Mining Division the amount of assessment work recorded in 1970 increased by 68 percent compared to 1969. Most of the work filed for assessment credit consisted of geophysical surveys and diamond drilling.

An outstanding increase in assessment work was recorded in the Patricia Mining Division in 1970 compared to 1969. The record increase for 1970 was 645 percent greater than that of the previous year. Most of the increase was due to the large amounts of geophysical work conducted in the Sturgeon Lake area. A summary of the types of assessment work recorded for 1969 and 1970 in the Kenora and Patricia Mining Districts is given in Tables 1 and 2 respectively.

Table 1 Assessment work recorded, 1969 and 1970

Kenora Mining Division

	1969	1970
Type of work	Days	Days
Manual Labour	494	732
Geophysical	16,527	26,389
Geological	5,782	2,180
Diamond drilling	18,455	30,737
Power equipment	1,660	3,719
Totals	43,646	63,757

Table 2 Assessment work recorded, 1969 and 1970.

Patricia Mining Division

Type of work	1969 Days	1970 Days
Manual Labour	1,160	49
Geophysical	12,592	303,747
Geological	2,144	13,013
Diamond drilling	44,652	82,843
Power equipment	1,514	871
Geochemical		281
Totals	62,168	400,804

A list of individuals and companies known to be engaged in exploration within the district, and a brief summary of the type and location of the exploration work is given in Table 3. The number preceding the name of the individual or company indicates the general areas on Figures 1 and 2 where work was carried out.

Mineral Production

Consolidated Canadian Faraday Limited

The only base metal mining operation in production in the district during 1970 was the Gordon Lake Mine at Werner Lake, located 50 miles north of Kenora. Nickel and copper production from this mine for 1970 was 105,504 tons. Most of the ore milled was produced from sublevel blast-hole stopes. The Dumbarton Mine, located in Manitoba 25 miles west of Werner Lake, provided most of the feed for the Werner Lake mill during 1970.

Caland Ore Company Limited

During 1970, iron production from the Caland Ore Company Limited open-pit mine in Freeborn Township, near Atikokan, was 2,501,044 tons of crude ore. An estimated 1,100,000 tons of pellets were produced from this ore. Coarse products amounted to 1,059,715 tons.

Steep Rock Iron Mines Limited

The open-pit iron mining operation in Freeborn and Schwenger Townships, just north of Atikokan, mined a total of 2,410,043 tons of iron ore in 1970.

Production in tons for 1970 is as follows:

Ore Type	North Roberts Mine	South Roberts Mine	Total
Direct	371,229	1,064,485	1,435,714
Crude	383,880	536,592	920,472
Total	755,109	1,601,077	2,356,186

Crude ore is described as 40-50 percent Fe; direct ore as +59.5 percent Fe.

Canadian National Railways

Quarry operations in Watten Township, about 10 miles east of Fort Frances, commenced February 27, 1970 and continued to December 16, 1970. An estimated 308,000 cubic yards of crushed rock was produced during the year for use as track ballast by the Canadian National Railways.

Properties Engaged in Development

Mattabi Mines Limited

A new company Mattabi Mines Ltd. was formed during 1970 to develop and mine copper, zinc, silver, and lead deposit discovered by Mattagami Lake Mines Ltd. at Sturgeon Lake in 1969. The discovery was made on Block No. 7, on ground owned by Abitibi Paper Co. Ltd. The newly formed company is owned 60 percent by Mattagami Lake Mines Ltd., and 40 percent by Abitibi Paper Co. Ltd.

Drilling has indicated ore reserves of 12,866,000 tons having an average grade of 7.6 percent zinc, 0.91 percent copper, 0.84 percent lead, 3.13 oz. silver, and [illegible]7 oz. gold per ton. Of this total, 8,236,000 with an average grade of 8.9 percent zinc, 1.06 percent copper, 0.99 percent lead, 3.98 oz. silver, and 0.008 oz. gold per ton will be mined by open-pit methods.

A 12-mile road was built during 1970 linking the deposit with Highway 599. Construction of plant buildings and overburden removal from the proposed open-pit area is currently underway. Production is scheduled for mid-1972 at a rate of 3,000 tons per day.

Maybrun Mines Limited

Development work was carried out during most of 1970 at the Maybrun Mines Ltd. copper deposit at Atikwa Lake, about 50 miles southeast of Kenora.

A diesel generating plant was put into operation and a mill with a capacity of at least 500 tons per day was erected to handle the copper ore from an open pit.

The mill started operating October 20, 1970 and continued for about 6 weeks at a capacity of about 575 tons per day. The operation was then closed down due to a drop in the price of copper.

SIGNIFICANT NEW INFORMATION

New Discoveries in the Sturgeon Lake Area

Drilling of geophysical conductors on ground held by Mattagami Lake Mines Ltd. about 3 miles to the west of their major discovery on Block No. 7, has indicated the presence of another zone of zinc, copper, and silver. The best intersection reported contained 33 feet of 14.44 percent zinc, 0.78 percent copper, 0.68 oz. silver, and 0.003 oz. gold per ton. Subsequent drilling has indicated that the mineralization zone is rather limited in extent (about 400 feet long) but additional drilling is planned. The mineralization occurs in a felsic volcanic environment similar in nature to the main orebody outlined on Block No. 7. The disseminated and massive sulphides are found in fragmental and porphyritic rhyolites.

Another important new discovery was made in October 1970, by Falconbridge Nickel Mines Ltd. on a 77 claim group optioned from New Brunswick Uranium Metals and Mining Limited. The property is located on the east side of Block No. 7, about 4 miles east of the Mattabi Mines Ltd. deposit. The second hole completed on the property which was drilled on an I.P. anomaly intersected a high-grade intersection of copper, zinc, and silver. Two other good intersections have been reported; the results are as follows:

Hole No.	Length (ft.)	Cu(%)	Zn(%)	Ag(oz.)	Au(oz.)
NBU-2-70	69.5	4.48	9.26	2.89	0.02
NBU-7-70	60.0	4.51	2.77	1.85	0.01
NBU-9-70	133.0	3.98	1.83		

The first hole drilled on the property, on a separate I.P. anomaly, was also a significant one. Although the intersection was narrow, the zone which was 2.1 feet in length assayed 3.56 percent copper, 2.1 percent zinc, 5.26 oz. silver, and 0.007 oz. gold per ton. Both of the mineralized zones occur in felsic volcanic rocks.

The discoveries made to the south of Sturgeon Lake during the past year are particularly significant in that the area of favourable mineralization has been extended to a length of at least 7 miles.

Table 3 Exploration Activity in 1970

The following is a list of individuals and companies engaged in exploration within the Kenora District in 1970, and the type of work known to be undertaken in each case. The numbers correspond to the numbered areas on Figures 1 and 2

Kenora Mining Division

	Individual or Company	Type of Work
1.	Alcock, C. A. 304 Rabbit Lake Drive, Kenora	Trenching and diamond drilling in the High Lake area, Ewart Tp.
2.	Amax Exploration, Inc.	Geological and geophysical investigation in the Kakagi Lake area.
3.	Asarco Exploration Co. of Canada Ltd.	Airborne and ground electromagnetic surveys and diamond drilling in the general Dryden area.
4.	Blondeau, Lorenzo McIndoe Falls, Vermont, U.S.A.	Prospecting and trenching in the Little Turtle Lake area.
5.	Boylen, M. J. Ste 908 - 330 Bay Street, Toronto	Diamond drilling of geophysical conductors in the Line Lake area.
6.	Canadian-Addicks Mining Corporation	Airborne electromagnetic survey and diamond drilling in the Crooked Pine Lake area
7.	Canadian British Aluminum Co.	Participating in an exploration program with Lynx Canada Explorations Ltd. and Dejour Mines Ltd. in the Wapageisi Lake area, southeast of Dryden.
8.	Canadian Malartic Gold Mines Ltd.	Electromagnetic and magnetometer surveys, trenching and diamond drilling on a copper-zinc property in a joint exploration venture with Goldray Mines Ltd. in the Dogpaw Lake area.
9.	Canadian Nickel Co. Ltd.	Airborne and ground electromagnetic and magnetometer surveys followed by diamond drilling in the general Dryden area, Raleigh Lake and Rowan Lake areas; electromagnetic and magnetometer surveys in Crozier and Devlin Tps.
10.	Chimo Gold Mines Ltd.	Electromagnetic and magnetometer surveys in the Valora and Unaka area; diamond drilling in the Contact Bay area, south of Dryden.
11.	Cone, R. C. Mine Centre, Ontario	Diamond drilling in the Grassy Lake area.
12.	Davidson, Peter Ste. 3 - 605 Sherbrooke Street, Winnipeg	Diamond drilling in the Paterson Lake area.
13.	Dejour Mines Ltd.	Participating in two exploration programs in an area southeast of Dryden, one involving Lynx Canada Explorations Ltd. and Canadian British Aluminum Co.; the other involving Lynx Canada Explorations Ltd., Cerro Corp. and Elgin Petroleum Corp.
14.	Doak, Clifford 647 Valour Road, Winnipeg 10	Stripping and trenching in the Buchan Bay area.
15.	Faid, T. G. 29 Stokes Street, Thunder Bay, Ontario	Magnetometer survey in the Turtlepond Lake area.
16.	Falconbridge Nickel Mines Ltd.	Electromagnetic and induced polarization surveys and diamond drilling in Bridges and Tustin Tps.
17.	Freeport Canadian Exploration Co.	Airborne electromagnetic surveys in the Brooks Lake, Buchan Bay, Bluffpoint Lake, Lower Manitou Lake, Dash Lake, Boyer Lake, Kaiarskons Lake, and Harper Lake areas.
18.	Hanna Mining Co.	Geophysical investigations in Sapawe Lake area.
19.	Holunga, W. 651 Sherburn Street, Winnipeg 10	Stripping and trenching in the Reynar Lake area.
20.	Kemins Explorations Ltd.	Electromagnetic and magnetometer surveys and diamond drilling in Hutchinson Tp.
21.	Kerr Addison Mines Ltd.	Airborne and ground electromagnetic and magnetometer surveys in the Shoal Lake area and on Western Peninsula, Lake of the Woods; diamond drilling on Western Peninsula, Lake of the Woods, and in Manross Tp.
22.	Lynx Canada Explorations Ltd.	Airborne and ground electromagnetic and magnetometer surveys in the Wapageisi Lake, Boyer Lake and Kawashegamuk Lake areas. Geophysical surveys in the Turtlepond Lake area.
23.	Massval Mines Ltd.	Electromagnetic and magnetometer surveys in the Press Lake area.
24.	Nabigon, R. J. 31 Park Blvd., Toronto 510	Magnetometer survey in the Monument Bay area of Shoal Lake.
25.	New Calumet Mines Ltd.	Electromagnetic survey in the Unaka Lake area.

	Individual or Company	Type of Work
26.	Noranda Exploration Co. Ltd.	Electromagnetic and magnetometer surveys and diamond drilling in Watten Tp. Electromagnetic and magnetometer survey, geological investigation, prospecting and trenching in the Eagle Rock Lake area; electromagnetic, magnetometer and induced polarization surveys in the Shoal Lake area; diamond drilling in Grassy Lake area.
27.	Northgate Exploration Ltd.	Geophysical investigations and diamond drilling in the Mine Centre area.
28.	North Rock Explorations Ltd.	Diamond drilling on a copper-nickel deposit in Halkirk and Watten Tps. in a joint venture with Seemar Mines Ltd.
29.	Olympia Mines Ltd.	Diamond drilling in Code and Manross Tps.
30.	Phelps Dodge Corp. of Canada Ltd.	Airborne and ground electromagnetic and magnetometer surveys and diamond drilling in the Grassy Lake area, and in the Western Peninsula area, Lake of the Woods.
31.	Pidgeon, G. L. Wabigoon, Ontario	Prospecting and diamond drilling in Hutchinson Tp.
32.	Regan, F. V. Ste 47 - 38 King Street West, Toronto	Diamond drilling in Hutchinson Tp.
33.	Scurry Rainbow Oil Ltd.	Electromagnetic and magnetometer surveys in the Valora and Unaka areas.
34.	Sukava, A. Vermilion Bay, Ontario	Stripping, trenching and prospecting in the Buchan Bay area on Eagle Lake.
35.	Tamen Mines Ltd.	Prospecting and trenching in Zealand and Brownridge Tps.
36.	Tudale Mines Ltd.	Diamond drilling on uranium property in the Paterson Lake area.
37.	Univex Exploration and Development Corp. Ltd.	Electromagnetic survey in the Richardson and Norway Lake areas.
38.	Zahalen, R. G. 323 Brock Street, Winnipeg 9	Magnetometer survey in the Reynar Lake area.
	Patricia Mining Division	
39.	Abitibi Paper Co.	Airborne and ground electromagnetic and magnetometer surveys on Block No. 8, west of Sturgeon Lake.
40.	Albert, Victor Box 9 - Site 28, R. R. #1, Dryden, Ontario	Stripping and trenching in Webb Tp.
41.	Algoma Steel Corp. Ltd.	Diamond drilling in the Greenmantle and Riach Lake areas.
42.	Amalgamated Beau-Belle Mines Ltd.	Geophysical surveys on ground optioned to Rio Tinto Canadian Exploration Ltd. in Sixmile Lake area.
43.	Amax Exploration Inc.	Electromagnetic and magnetometer surveys in the S.W. pt. Sturgeon Lake, Beckington Lake and Seseganaga Lake areas. Geochemical work and drilling in the S.W. pt. Sturgeon Lake area; geological survey in the South of Sturgeon Lake area.
44.	Ardel Explorations Ltd.	Geophysical surveys in the Penassi Lake area.
45.	Bison Petroleum and Minerals Ltd.	Electromagnetic and magnetometer surveys and diamond drilling in the Sixmile Lake area.
46.	Black Giant Mines Ltd.	Electromagnetic and magnetometer surveys conducted in a joint project with Canex Aerial Exploration Ltd. in the Sturgeon Lake area.
47.	Bordun Mining Corp. Ltd.	Electromagnetic and magnetometer surveys in the Sixmile Lake and Fourbay Lake areas.
48.	Cadell, Morris 3319 Coldstream Avenue, Vernon, B. C.	Magnetometer survey in Poisson Tp.
49.	Calmor Iron Bay Mines Ltd.	Airborne and ground geophysical surveys and diamond drilling in the Sturgeon Lake area.
50.	Canadex Mining Corp. Ltd.	Electromagnetic and magnetometer surveys and diamond drilling in the Sixmile Lake area.
51.	Canadian Addicks Mining Corp.	Electromagnetic and magnetometer surveys in the S.W. pt. Sturgeon Lake area.
52.	Canadian Nickel Co. Ltd.	Exploration including geophysical surveys and diamond drilling in the Pickle Lake area; diamond drilling in the Grebe Lake area, and Boucher Tp.
53.	Canex Aerial Exploration Ltd.	Electromagnetic and magnetometer surveys in the Squaw Lake and Beckington Lake areas; diamond drilling in the Squaw Lake area.

	Individual or Company	Type of Work
54.	Chimo Gold Mines Ltd.	Airborne and ground electromagnetic and magnetometer surveys and diamond drilling in the S.W. pt. Sturgeon Lake area.
55.	Cochenour Willans Gold Mines Ltd.	Exploration program involving participation with Selco Exploration Co. Ltd. in airborne and ground electromagnetic and magnetometer surveys followed by diamond drilling in the Fry Lake, Duffel Lake, Wesleyan Lake, Kawashe Lake, Drum Lake, and Johnston Bay (Lake St. Joseph) areas.
56.	Combined Metal Mines Ltd.	Diamond drilling in the Endogoki Lake area.
57.	Conwest Exploration Co. Ltd.	Electromagnetic and magnetometer surveys in the Fourbay Lake, Sixmile Lake and Squaw Lake areas.
58.	Cominco Ltd.	Electromagnetic, magnetometer and gravimetric surveys in the Fourbay Lake area.
59.	D'Aragon Mines Ltd.	Electromagnetic, magnetometer and geological surveys in the Sixmile Lake area.
60.	Daering Exploration Corp.	Electromagnetic and magnetometer surveys in the Penassi Lake area
61.	Dempster, L. A. 551 Eglinton Avenue, Apt. 701, Toronto	Airborne electromagnetic and magnetometer surveys in the Penassi Lake area.
62.	Dome Exploration (Canada) Ltd.	Diamond drilling in the Endogoki Lake and Jabez Lake areas and Benner, Chevrier, McGillis, Savant and Smye Tps.
63.	Falconbridge Nickel Mines Ltd.	Electromagnetic, magnetometer and induced polarization surveys followed by diamond drilling in the South of Sturgeon Lake, and Sixmile Lake areas.
64.	Fano Mining and Exploration, Inc.	Electromagnetic and magnetometer surveys and diamond drilling in a joint venture with Chipman Lake Mines Ltd. in the S.W. pt. Sturgeon Lake, Sixmile Lake areas, and Fourbay Lake area.
65.	Ganda Silver Mines Ltd.	Electromagnetic and magnetometer surveys followed by diamond drilling in the Fourbay Lake area.
66.	Giant Sturgeon Mining Corp.	Geophysical surveys in the Fourbay Lake area.
67.	Gordon, D. W. 908 - 330 Bay Street, Toronto 105	Diamond drilling in the Endogoki Lake area.
68.	Green Point Mines Ltd.	Exploration in conjunction with Consolidated Red Poplar in the Sixmile Lake and Quest Lake areas.
69.	Haahti, J. 230 Laughton Avenue, Toronto	Airborne electromagnetic and magnetometer surveys in the Penassi Lake area.
70.	Heino, D. A. 2002 - 1177 West Hastings Street, Vancouver	Electromagnetic survey in Boucher Tp.
71.	Houston, G. 11 Tallforest Crescent, Etobicoke, Ontario	Electromagnetic and magnetometer surveys in the Sixmile Lake area.
72.	Huntley, D. A. Ste. 1000 - 11 Kings Street West, Toronto	Airborne electromagnetic and magnetometer surveys in the S.W. pt. Sturgeon Lake area.
73.	Huston, C. C. and Associates	Electromagnetic and magnetometer surveys in the Drum Lake area; electromagnetic survey in the Meen Lake area; induced polarization survey in Carling Lake area.
74.	Hydra Explorations Ltd.	Electromagnetic and magnetometer surveys in the Sixmile Lake area.
75.	Ideal Bay Explorations Ltd.	Electromagnetic survey in the S. W. pt. Sturgeon Lake area.
76.	Imperial Oil Enterprises Ltd.	Electromagnetic and magnetometer surveys in Jordan and Drayton Tps. and in the Parnes Lake area.
77.	Janus Explorations Ltd.	Airborne electromagnetic and magnetometer survey in the Penassi Lake area.
78.	Jorex Ltd.	Airborne electromagnetic survey in the Quest Lake and South of Sturgeon Lake areas; and ground electromagnetic and magnetometer surveys in the Penassi Lake area.
79.	Kostiuk, M. Valora, Ontario	Trenching in the Yonde area.
80.	Lewis Red Lake Mines Ltd.	Electromagnetic and magnetometer surveys in the S.W. pt. Sturgeon Lake area.
81.	Madsen Red Lake Gold Mines Ltd.	Electromagnetic survey in the S.W. pt. Sturgeon Lake area.
82.	Mattagami Lake Mines Ltd.	Electromagnetic and magnetometer surveys in the South of Sturgeon Lake, Sixmile Lake, Fourbay Lake, Penassi Lake, and S.W. pt. Sturgeon Lake areas, followed by diamond drilling; geophysical survey and diamond drilling on Block No. 7
83.	Matta-King Mining Corp. Ltd.	Magnetometer survey in the Fourbay Lake area.

	Individual or Company	Type of Work
84.	McCombe, Robert J. Box 39, Sioux Lookout, Ontario	Trenching in Pickerel Tp.
85.	Milner, G. N. 250 University Ave., Ste 600, Toronto	Airborne geophysical surveys in the S.W. pt. Sturgeon Lake area.
86.	Murgor Explorations Ltd.	Airborne geophysical surveys in the Penassi Lake area.
87.	New Calumet Mines Ltd.	Airborne electromagnetic and magnetometer surveys in Slaght Tp. in cooperation with Zenmac Metal Mines Ltd.
88.	Newconex Canadian Exploration Ltd.	Electromagnetic and magnetometer surveys followed by diamond drilling in the South of Sturgeon Lake area.
89.	Norlex Mines Ltd.	Diamond drilling in the Sixmile Lake area.
90.	Noranda Exploration Co. Ltd.	Electromagnetic and magnetometer surveys in Slaght Tp., South of Sturgeon Lake, S.W. pt. Sturgeon Lake and Quest Lake areas; diamond drilling in S.W. pt. Sturgeon Lake area. Geophysical surveys and diamond drilling in the Smock Lake area.
91.	Potter, George 11 Tallforest Crescent, Etobicoke, Ont.	Electromagnetic and magnetometer surveys in the Quest Lake and Sixmile Lake areas.
92.	Prudent Mining Corp.	Electromagnetic and magnetometer surveys in the S.W. pt. Sturgeon Lake area.
93.	Quadrate Exploration Ltd.	Airborne geophysical survey in the Penassi Lake area.
94.	Ranta, E. 85 Richmond Street West, Toronto	Magnetometer survey in the Penassi Lake area.
95.	Rio Tinto Canadian Exploration Ltd.	Electromagnetic, magnetometer and geological surveys in the Sixmile Lake, and Fourbay Lake areas on ground optioned from Toronado Mines Ltd.
96.	Santa Maria Mines Ltd.	Electromagnetic survey in the S.W. pt. Sturgeon Lake area.
97.	Scandia Mining and Exploration Ltd.	Electromagnetic, magnetometer, and induced polarization surveys in the S.W. pt. Sturgeon Lake area.
98.	Schiralli, Roco Anthony 2002 - 1177 West Hastings Street, Vancouver	Electromagnetic survey in the Beckington Lake, Seseganaga Lake and Squaw Lake areas.
99.	Scott, Leslie 11 Tallforest Crescent, Etobicoke, Ont.	Electromagnetic and magnetometer surveys in the Quest Lake area.
100.	Scurry Rainbow Oil Ltd.	Electromagnetic and magnetometer surveys, followed by diamond drilling in the S.W. pt. Sturgeon Lake area, on property optioned from Briar-Court Mines Ltd.
101.	Selco Exploration Co. Ltd.	Airborne and ground electromagnetic and magnetometer surveys in the Fry Lake, Bamaji Lake and Drum Lake areas; and in the Caron Lake, Greenbush Lake and Pashkokogan Lake areas; ground geophysical surveys in the Beckington Lake, Fourbay Lake and Squaw Lake areas; geochemical survey in the Bamaji Lake area; diamond drilling in the Drum Lake and Squaw Lake areas.
102.	Silver Lining Mines Ltd.	Electromagnetic and magnetometer surveys in the S.W. pt. Sturgeon Lake, and South of Sturgeon Lake areas; diamond drilling in the South of Sturgeon Lake area.
103.	Silverside Mines Ltd.	Airborne electromagnetic and magnetometer surveys in the Fourbay Lake area.
104.	Spooner Mines and Oils Ltd.	Electromagnetic and magnetometer surveys in the Penassi Lake, Sixmile Lake, Fourbay Lake, and S.W. pt. Sturgeon Lake areas.
105.	Sturgeon King Mining Corp. Ltd.	Geophysical surveys in the Yonde and Zarn areas.
106.	Texmont Mines Ltd.	Electromagnetic and magnetometer surveys in the Sixmile Lake area.
107.	Texore Mines Ltd.	Electromagnetic survey in the Beckington Lake area.
108.	Thompson, W. M. 38 King Street, Sioux Lookout, Ont.	Electromagnetic and magnetometer surveys in the S.W. pt. Sturgeon Lake area.
109.	Tough, James S. Box 461, Bracebridge, Ontario	Airborne geophysical surveys in the Penassi Lake area.
110.	Union Miniere Explorations and Mining Corp. Ltd.	Geophysical surveys and diamond drilling in the Kapkichi Lake area, west of Central Patricia.
111.	Urban Quebec Mines Ltd.	Magnetometer survey followed by diamond drilling in the S.W. pt. Sturgeon Lake area.
112.	Win-Eldrich Mines Ltd.	Electromagnetic and magnetometer surveys in the Penassi Lake area.

New Maps and Literature

Publications pertaining to the Kenora district and issued during 1970 are listed in the following section. Figures 1 and 2 show location of areas within the district covered by new maps and reports issued by the Department of Mines and Northern Affairs.

Coloured Maps

Map 2169: Sioux Lookout-Armstrong Sheet, Kenora and Thunder Bay Districts (52G,H,I,J); Geological Compilation Series. Geological compilation by J.C. Davies, A.P. Pryslak 1966 and E.G. Pye 1965. Scale, 1 inch to 4 miles.

Map 2175: Red Lake-Birch Lake Sheet, Kenora District (52K,L,M,N); Geological Compilation Series. Geology and geological compilation by S.A. Ferguson, D.D. Brown, J.C. Davies and A.P. Pryslak 1966, 1967. Scale, 1 inch to 4 miles.

Map 2209: Watcomb Area, Kenora District (52G/11, G/14); Geology by N.F. Trowell and assistants 1968. Scale, 1 inch to 1/2 mile.

Preliminary Maps

P.586 Rainy Lake Area (West Part), District of Rainy River (52C/10, C/15, C/11, C/14); Geology by F.R. Harris and assistants 1969. Scale, 1 inch to 1/4 mile.

P.587 Rainy Lake Area (East Part), District of Rainy River (52C/10, C/15); Geology by F.R. Harris and assistants 1969. Scale 1 inch to 1/4 mile.

P.588 Bell Lake-Sturgeon Lake (Northwest Part), District of Kenora (52G/14); Geology by N.F. Trowell and assistants 1969. Scale, 1 inch to 1/4 mile.

P.589 Bell Lake-Sturgeon Lake (Northeast Part), Districts of Kenora and Thunder Bay (52G/14, G/15); Geology by N.F. Trowell and assistants 1969. Scale, 1 inch to 1/4 mile.

P.590 Bell Lake-Sturgeon Lake (Southwest Part), District of Kenora (52G/14); Geology by N.F. Trowell and assistants 1969. Scale, 1 inch to 1/4 mile.

P.591 Bell Lake-Sturgeon Lake (Southeast Part), Districts of Kenora and Thunder Bay (52G/15, G/14); Geology by N.F. Trowell and assistants 1969. Scale, 1 inch to 1/4 mile.

P.594 Western Peninsula Area (West Sheet), District of Kenora (52E/10); Geology by J.C. Davies and assistants 1969. Scale, 1 inch to 1/4 mile.

P.604 Western Peninsula Area (East Sheet), District of Kenora (52E/10); Geology by J.C. Davies and assistants 1969. Scale, 1 inch to 1/4 mile.

Aeromagnetic Maps

P.452 Aeromagnetic Maps of Carbonatite-Alkalic Complexes in Ontario. Compilation by J. Satterly 1968; revised with additions 1970. Scale as noted.

P.577 Ogoki River, Aeromagnetic Compilation Map, Kenora, Thunder Bay and Rainy River Districts. Published by Ontario Department of Mines and Geological Survey of Canada, 1970. Scale, 1 inch to 16 miles.

Geological Reports

GR88 Watcomb Area, District of Kenora, by N.F. Trowell. Accompanied by Map 2209, Watcomb Area. Scale, 1 inch to 1/2 mile.

Open File Reports

OFR5046 Geology of the Vermilion-Abram Lakes Area, District of Kenora, by F.J. Johnston.

OFR5051 Geology of Bell Lake-Sturgeon Lake Area, Districts of Kenora and Thunder Bay, by N.F. Trowell.

OFR5053 Geology of the Rainy Lake Area, District of Rainy River, by F.R. Harris.

Industrial Mineral Reports

IMR33 Pits and Quarries; A guide to site development and rehabilitation, by Anthony M. Bauer.

IMR34 Urbanization and Rehabilitation of Pits and Quarries, by D.F. Hewitt and M.A. Vos.

Miscellaneous Papers

MP33 Annual Report of Resident Geologists' Section; Part 1, Red Lake District, by R.A. Riley; Kenora District, by H.L. King; and Thunder Bay District, by C.R. Kustra.

MP37 Current Activities and Trends in Exploration in Ontario, by E.G. Pye.

MP40 The Geological Branch; Its History, Services and Operation, by J.E. Thomson.

MP43 Summary of Field Work 1970, by the Geological Branch. Edited by E.G. Pye, Chief Geologist.

Miscellaneous Publications and Maps

Vol. 1 Annual Statistical Report for the Year 1968; Mineral Production of Ontario. Compiled by E.E. Matten.

Vol. 78 Annual Report for the Year 1968; Report on Mining Operations in Ontario. Compiled by G.S. Riddell.

Mining Lands Publications

MLP3 Index of Township and Area Claim Maps in Ontario, 1970. Produced by the staff of the Mining Lands Branch.

Other Literature

Petrology of the Perrault Falls Granite, by J. Morin. Unpublished MSc. thesis, University of Manitoba, 1970.

New Roads

Construction of a 12-mile road linking the Mattabi Mines Ltd. property on the south shore of Sturgeon Lake with Highway 599, was initiated and completed during 1970.

Road construction was started during 1970 on a road which will eventually link Highway 11 in the Fort Frances area with Highway 17 in the Dryden area. The road leads northward from Nickel Lake, in Halkirk Township, 18 miles east of Fort Frances. Plans are for the road to join Highway 17 at Dinorwic, about 18 miles east of Dryden.

Three additional miles of construction were completed during 1970 on the Sand Lake Road, a timber access road which branches eastward from the Caribou Falls Road about 4 miles north of the Whitedog Dam and Power House. The road is being constructed by the Timber Branch of the Department of Lands and Forests.

MAPPING PROJECTS OF THE GEOLOGICAL SURVEYS SECTION

Three mapping projects were undertaken in the Kenora district by the Geological Branch in 1970. The Glitter Lake area, east of Sturgeon Lake, was mapped by a party lead by N.F. Trowell. The Otukamamoan Lake area, northeast of Fort Frances, was mapped by a party under the direction of C. Blackburn. The author, aided by two assistants, continued mapping the Keewatin-Kenora area.

Summary reports on areas mapped during 1970 are given in "Summary of Field Work, 1970", by the Geological Branch, Miscellaneous Paper 43, edited by E.G. Pye.

NEW INFORMATION ADDED TO RESIDENT GEOLOGIST'S FILES

New information added to the files in 1970 consisted mainly of work submitted for assessment credits. Copies of reports of work submitted by companies and individuals were also filed. Other data added included copies of reports and prospectuses submitted to the Ontario Securities Commission and reports on properties visited by the Resident Geologist. Details of the data added to the files are found in Tables 4 and 5.

Table 4 Assessment Reports Received in 1970

Abbreviations:

Air	-	Airborne	IP	-	Induced Polarization Survey
5 DDH (620')	-	5 diamond drill holes totalling 620'	Mag	-	Magnetometer Survey
EM	-	Electromagnetic Survey	Rad	-	Radiometric Survey
Geol.	-	Geological Survey			

Location	Ownership	Commodity Sought	Assessment Work	File No.
Code Tp.	Jensen, A., Box 217, Kenora, Ont. Schack, D., 150 Broadway, New York	Copper	1970 - 3 DDH (500')	52E/ 9 SE
Ewart Tp.	Alcock, C. A. 304 Rabbit Lake Dr., Kenora		1970 - 1 DDH (205') 1970 - Trenching	52E/11 NE
Halkirk Tp.	Lakatos, S. 1036 Third St. East, Fort Frances, Ont.		1969 - 3 DDH (271')	52C/10 NW
Halkirk and Watten Tp.	Noranda Exploration Co. Ltd.	Copper, nickel, silver	1966 - 16 DDH (5651')	52C/11 NE
Hutchinson Tp.	Kemins Explorations Ltd.		1969 - Air Mag & EM	52B/14 SW
	Pidgeon, G. Wabigoon, Ontario		1970 - 1 DDH (110')	52B/14 SW
	Regan, F. V. Ste. 47 38 King Street W., Toronto		1970 - 1 DDH (408')	52B/14 SW
Manross Tp.	Kerr Addison Mines Ltd.	Copper	1970 - 7 DDH (2371')	52E/ 9 SW
Rugby Tp.	Chapman, S. E. 425 University Ave., Toronto	Uranium	1969 - Air Rad	52F/14 NE 52F/15 NW
Schwenger Tp.	Kemins Explorations Ltd.		1969 - Air Mag & EM	52B/13 SE
Tustin Tp.	Falconbridge Nickel Mines Ltd.	Copper	1970 - 2 DDH (1234')	52F/13 SW
Watten Tp.	Laberge, Marcel 210 North Marks Street Thunder Bay (F), Ontario		1969 - Trenching	52C/11 NE
	Noranda Exploration Co. Ltd.	Copper, iron	1967 - Mag, EM 1969 - 1 DDH (383') 1970 - 2 DDH (838')	52C/11 NE
Atikwa Lake	Maybrun Mines Ltd.	Copper	1969 - EM	52F/ 5 NE
Bluffpoint Lake	Freeport Canadian Exploration Co.		1970 - Air EM	52F/ 3 NW
Boyer Lake	Freeport Canadian Exploration Co.		1970 - Air EM	52F/ 7 NE
Brooks Lake	Freeport Canadian Exploration Co.		1970 - Air EM	52F/ 4 NE
Buchan Bay	Doak, Clifford 647 Valour Rd., Winnipeg		1970 - Stripping and Trenching	52F/11 NE
	Freeport Canadian Exploration Co.		1970 - Air EM	52F/11 NE
	Sukava, Aron Vermilion Bay, Ontario		1970 - Stripping and Trenching	52F/11 NE
Contact Bay	Chimo Gold Mines Ltd.		1970 - 3 DDH (820')	52F/10 NW
	Hollinger Mines Ltd.	Copper, nickel	1969 - Mag, EM 1969 - 3 DDH (1414')	52F/10 NW
Crooked Pine Lake	Addicks, Mentor C. 5107 Arden Avenue Minneapolis, Minn. 55424	Copper	1970 - Air EM 1970 - 1 DDH (54')	52B/14 SE
	Kemins Exploration Ltd.		1969 - Air Mag & EM	52B/14 SE
Dash Lake	Freeport Canadian Exploration Co.		1970 - Air EM	52F/ 4 SE
Eagle Rock Lake	Noranda Exploration Co. Ltd.	Copper	1969 - Mag, EM	52F/ 2 NE
Finlayson Lake	Addicks, M. C. 5615 County Road, 18 North, Minneapolis, Minn.	Copper	1969 - 1 DDH (350')	52B/13 NE
	Smith, Ivan F. 1169 Grosvenor Ave., Winnipeg		1969 - Trenching	52B/13 NE

Location	Ownership	Commodity Sought	Assessment Work	File No.
Fisher Lake	Boylen, M. J. Ste. 908 - 330 Bay St., Toronto		1969 - EM	52F/12 SE
Grassy Lake	Cone, Russel C. Mine Centre, Ontario	Copper	1970 - 1 DDH (132')	52C/10 NE
	Kowall, J. and Huber, G. Fort Frances, Ontario		1969 - 1 DDH (352')	52C/10 NE
	Noranda Exploration Co. Ltd.	Copper, zinc, lead, iron	1969 - 1 DDH (320') 1970 - 2 DDH (814')	52C/10 NE
	Pidgeon, G. L. Wabigoon, Ontario	Zinc, silver, gold, lead	1969 - 1 DDH (114')	52C/10 NE
Harper Lake	Freeport Canadian Exploration Co.		1970 - Air EM	52F/ 7 NW
Kaiarskons Lake	Canadian Nickel Co. Ltd.	Iron	1969 - 2 DDH (753')	52F/ 3 SW
	Freeport Canadian Exploration Co.		1970 - Air EM	52F/ 3 SW
Line Lake	Boylen, M. J. Ste. 908 - 330 Bay St., Toronto		1969 - EM 1970 - 3 DDH (1139') 46 core samples	52F/11 SW
Little Turtle Lake	Blondeau, Lorenzo McIndoe Falls, Vermont 05050		1970 - Trenching	52C/15 SE
Lower Manitou Lake	Freeport Canadian Exploration Co.		1970 - Air EM	52F/ 7 SW
Mang Lake	Canadian Nickel Co. Ltd.	Copper	1969 - 3 DDH (1758')	52F/ 2 NW
Napanee Lake	Canadian Nickel Co. Ltd.	Copper	1969 - 7 DDH (1689') 1970 - 1 DDH (153')	52F/ 3 NE
Norway Lake	Univex Exploration and Development Corp. Ltd.		1970 - EM	52G/ 3 SW
Paterson Lake	Can-Fer Mines Ltd.	Uranium	1969 - Mag, Geol. 1969 - 3 DDH (113')	52L/ 7 SE
	Davidson, Peter Ste. 3 - 605 Sherbrooke Street Winnipeg 2.		1970 - 3 DDH (1090')	52L/ 7 SE
Rex Lake	Duvan Copper Co. Ltd.	Copper, nickel	1969 - Geol.	52L/ 7 NE
Reynar Lake	Falconbridge Nickel Mines Ltd.		1969 - Mag, EM	52L/ 6 NE
	Holunga, Willis 651 Sherbrooke St., Winnipeg 10		1970 - Stripping and Trenching	52L/ 6 NE
Richardson Lake	Univex Exploration and Development Corp. Ltd.		1970 - EM	52G/ 3 SE
Rowan Lake	Canadian Nickel Co. Ltd.	Copper	1970 - 4 DDH (780')	52F/ 5 SE
Sabawi Lake and McCaul Tp.	Kemins Exploration Ltd.		1969 - Air Mag & EM	52B/14 SW
Snowshoe Lake	Halladay, Lorne B. 6 Glenholme Ave., Toronto 170	Uranium	1969 - 6 DDH (304')	52L/1
Snowshoe Lake	Syme, J. C/o H. M. Linnel Donkirk Heights, Kenora	Uranium	1969 - 1 DDH (440')	52L/11 SE
Turtlepond Lake	Canadian Geomarine Corp. Ltd.		1969 - Mag	52F/10 SE
Valora and Unaka Area	Chimo Gold Mines Ltd.		1970 - Mag, EM	52G/14 SE
Vista Lake	Canadian Nickel Co. Ltd.		1969 - 4 DDH (1985')	52F/ 3 SE
		Patricia Mining Division		
Benner Tp.	Canadian Nickel Co. Ltd.	Copper	1969 - 2 DDH (442')	52J/ 9 SW 52J/10 SE
	Dome Exploration (Canada) Ltd.	Copper, zinc, iron	1970 - 3 DDH (1113')	52J/ 9 SW 52J/10 SE
Boucher Tp.	Canadian Nickel Co. Ltd.		1970 - 1 DDH (160')	52J/ 7 SE
Chevrier Tp.	Dome Exploration (Canada) Ltd.		1970 - 2 DDH (621')	52J/ 8 SE

Location	Ownership	Commodity Sought	Assessment Work	File No.
Conant Tp.	Canadian Nickel Co. Ltd.	Copper	1968 - 1 DDH (209')	52J/ 7 SE
Drayton Tp.	Kerr Addison Mines Ltd.	Iron	1969 - 8 DDH (7500')	52J/ 4 NE/SE
McCubbin Tp.	Canadian Nickel Co. Ltd.		1968 - 1 DDH (467')	52J/ 7 NE
Pickerel Tp.	McCombe, Robert J. Box 39, Sioux Lookout, Ont.		1970 - Trenching	52F/16 NE
Poisson Tp.	Cadell, Morris 3319 Coldstream Avenue Vernon, B. C.		1970 - Mag	52J/ 8 NW
Savant Tp.	Dome Exploration (Canada) Ltd.		1970 - 6 DDH (1816')	52J/ 8 NW
Smye Tp.	Dome Exploration (Canada) Ltd.	Copper	1970 - 1 DDH (403')	52J/ 8 SW
Webb Tp.	Albert, Victor Box 9 - Site 28 R. R. #1, Dryden, Ontario		1970 - Stripping and Trenching	52F/16 NW
	Woitozwioz, Mike R. R. #1, Dryden, Ontario		1969 - Trenching	52F/16 NW
Achapi, August, Lowry, and Atikokiwan Areas	Sturdy Mines Ltd.	Iron	1969 - Mag, EM	52P/ 4
Beckington Lake	Canadian Nickel Co. Ltd.	Copper	1969 - 5 DDH (732')	52J/ 2 NE
Caley Lake	Newconex Canadian Exploration Ltd.		1969 - EM, Geol.	52O/ 7 SE
Carling Island (Lake St.Joseph)	Algoma Steel Corp. Ltd.	Iron	1969 - Mag	52O/ 2 SE/SW
Drum Lake	Cochenour Willans Gold Mines Ltd.	Copper, zinc	1970 - 3 DDH (1103')	52O/ 3 NE
	Selco Exploration Ltd.	Copper, zinc	1970 - 8 DDH (1480')	52O/ 3 NE
Duffel Lake	Cochenour Willans Gold Mines Ltd.		1970 - 1 DDH (84')	52O/ 2 NW
	Newconex Canadian Exploration Ltd.		1969 - EM, Geol.	52O/ 2 NW
Endogoki Lake	Canadian Nickel Co. Ltd.		1967 - 2 DDH (308') 1968 - 5 DDH (1419')	52J/ 9 SW
	Combined Metal Mines Ltd.	Copper, iron	1970 - 3 DDH (1180')	52J/ 9 SW
	Dome Exploration (Canada) Ltd.	Copper, iron, zinc	1970 - 4 DDH (1230')	52J/ 9 SW
Evans Lake	Canadian Nickel Co. Ltd.		1969 - 1 DDH (209')	52J/ 7 SE
Flying Loon Lake	Goldray Mines Ltd.		1969 - Air EM	52G/13 SE
Fog Lake and Manion Tp.	Canadian Nickel Co. Ltd.		1969 - 2 DDH (373')	52J/ 1 NW
Fourbay Lake	Bordun Mining Corp. Ltd.		1970 - Mag, EM	52J/ 2 SW
	Conwest Exploration Co. Ltd.		1969 - Mag, EM, Geol.	52J/ 2 SW
	Mattagami Lake Mines Ltd.		1969 - Mag, EM, Geol.	52J/ 2 SW
Fry Lake	Cochenour Willans Gold Mines Ltd.	Copper, zinc, molybdenum	1970 - 8 DDH (1670')	52O/ 3 NW
Grebe Lake	Canadian Nickel Co. Ltd.		1970 - 5 DDH (1845')	52J/ 7 NE
Greenmantle Lake	Algoma Steel Corp. Ltd.	Iron	1970 - 1 DDH (484')	52P/ 3 SW
Highstone Lake	Canadian Nickel Co. Ltd.		1969 - 2 DDH (393')	52J/ 6 NW
Jabez Lake	Dome Exploration (Canada) Ltd.		1970 - 1 DDH (298')	52J/ 9 NW
Johnston Bay (Lake St.Joseph)	Cochenour Willans Gold Mines Ltd.	Copper, zinc	1970 - 2 DDH (226')	52O/ 3 SE
Kapkichi Lake	Union Miniere Explorations and Mining Corp. Ltd		1970 - 1 DDH (456'), Mag	52O/ 8 NW
Kawashe Lake	Cochenour Willans Gold Mines Ltd.	Copper, zinc	1970 - 2 DDH (202')	52O/ 6 SE
Parnes Lake	Goldray Mines Ltd.		1969 - Air EM	52G/13 NW
Penassi Lake	Daering Explorers Corp. Ltd.		1970 - Mag, EM	52G/14 NE
	Jorex Ltd.		1970 - Mag, EM	52G/14 NE
	Mattagami Lake Mines Ltd.		1970 - Mag, EM	52G/14 NE
	Win-Eldrich Mines Ltd.		1970 - Mag, EM	52G/14 NE

Location	Ownership	Commodity Sought	Assessment Work	File No.
Riach Lake	Algoma Steel Corp. Ltd.	Iron	1969 - Soil sampling	52O/ 1 SW
Sixmile Lake	Bordun Mining Corp. Ltd.		1970 - Mag, EM 1970 - 7 DDH (1968')	52G/15 NW
	Canadex Mining Corp. Ltd.		1969 - Mag, EM	52G/15 NW
	Conwest Exploration Co. Ltd.		1970 - Mag, EM	52G/15 NW
	Falconbridge Nickel Mines Ltd.		1970 - 2 DDH (1011')	52G/15 NW
	Hydra Explorations Ltd.		1970 - Mag, EM	52G/15 NW
	Mattagami Lake Mines Ltd.	Copper, zinc, iron	1970 - Mag, EM 1970 - 2 DDH (1015') 1969 - 2 DDH (1320')	52G/15 NW
	Milner, George Noel 250 University Ave., Ste. 600 Toronto, Ontario	Copper	1970 - 6 DDH (2989')	52G/15 NW
	Wahl, W. G. Ltd. 302 Bay Street, Toronto	Fluorite	1969 - 5 DDH (4336')	52G/15 NW
Smock Lake	Goldray Mines Ltd.		1969 - Air EM	52G/13 NE
Solitude Lake	Canadian Nickel Co. Ltd.	Copper	1968 - 3 DDH (553') 1969 - 2 DDH (253')	52J/10 SE
	Hanna Mining Co. Ltd.		1967 - EM	52J/10 SE
South of Sturgeon Lake	Falconbridge Nickel Mines Ltd.	Copper, zinc	1970 - 1 DDH (699')	52G/15 SW
	Mattagami Lake Mines Ltd.		1970 - Mag, EM	52G/15 SW
	Silver Lining Mines Ltd.	Copper	1970 - 7 DDH (1996')	52G/15 SW
S.W. pt. of Sturgeon Lake	Addicks, Mentor C. Sr. 5107 Arden Avenue Minneapolis, Minn.		1970 - Mag, EM	52G/14 SE
	Chimo Gold Mines Ltd.		1970 - Mag, EM, Air EM	52G/14 SE
	Huntley, D. A. Ste. 1000, 11 King Street W., Toronto		1970 - Air EM	52G/14 SE
	Lewis Red Lake Mines Ltd.		1970 - Mag, EM	52G/14 SE
	Mattagami Lake Mines Ltd.	Copper, zinc	1969 - Mag, EM 1970 - Mag, EM 1970 - 9 DDH (6015')	52G/14 SE
	Mid-North Engineering		1970 - Air EM	52G/14 SE
	Milner, George Noel Ste. 600-250 University Avenue Toronto	Iron	1970 - Air EM 1970 - 1 DDH (773') 37 Core samples	52G/14 SE
	Scurry Rainbow Oil Ltd.		1970 - Mag, EM	52G/14 SE
	Urban Quebec Mines Ltd.		1970 - 2 DDH (869')	52G/14 SE
Squaw Lake	Amax Exploration Ltd.		1969 - Air Mag	52J/ 2 SE
	Canex Aerial Exploration Ltd.	Copper	1970 - 2 DDH (1411')	52J/ 2 SE
	Conwest Exploration Co. Ltd.		1970 - Mag, EM	52J/ 2 SE
	Selco Exploration Co. Ltd.	Copper, zinc	1969 - 4 DDH (663') 1970 - 8 DDH (2838'), EM	52J/ 2 SE
Store Lake	Canadian Nickel Co. Ltd.		1969 - 1 DDH (180')	52J/ 5 NE
Wright Lake	Newconex Canadian Exploration Ltd.		1969 - EM, Geol.	52O/ 7 SW
Wyatt Lake	Goldray Mines Ltd.		1969 - Air EM	52G/14 NW
	Silver Miller Mines and New Davies Petroleum Ltd.		1969 - Air Mag, & EM	52G/14 NW
Yonde Area	Kostiuk, Martin Valora, Ontario		1970 - Trenching	52G/13 NE

Table 5 Other Information Added to Files in 1970

Kenora Mining Division

Location	Ownership	Commodity Sought	Data Filed	File No
Bridges Tp.	Cates Property	Zinc, silver, lead	1970 - Property Report	52F/13 SE
Brownridge and Zealand Tp.	Taman Uranium Mines Ltd.	Tungsten	1970 - Prospectus	52F/15 SE
Contact Bay Area	Nabish Lake Property	Copper, nickel	1970 - Property Report	52F/10 NW
Dryden and Wabigoon Area	Dejour Mines Ltd.		1970 - Prospectus	52F/ 7 NE 52F/ 8 SW 52F/10 SE
Hutchinson Tp.	Kemins Exploration Co. Ltd.	Iron, copper, nickel, cobalt	1970 - Property Report	52B/14 SW
	Paulpic Gold Mines Ltd.	Iron, copper, nickel, cobalt	1969 - Property Report and Prospectus. Reports submitted to Ontario Securities Commission.	52B/14 SW
Paterson Lake	Tudale Mines Ltd.	Uranium	1970 - Property Report	52L/ 7 SE
Pickerel Lake	Thew Property	Copper	1970 - Property Report	52B/11 NW
Reynar Lake	Consolidated Manitoba Mines Ltd.		1970 - Prospectus	52L/ 6 NE
Sabawi Lake and McCaul Tp.	Monteagle Minerals Ltd.	Copper, iron	1970 - Property Report and Prospectus	52B/14 SW
Turtlepond Lake	Lantz Property	Copper, nickel	1970 - Property Report	52F/10 SE
	Glatz-Kozowy Property	Copper, nickel	1970 - Property Report	52F/10 SE
Werner Lake	Consolidated Manitoba Mines Ltd.		1970 - Prospectus	52L/ 7 NW

Patricia Mining Division

Beckington Lake	Texore Mines Ltd.		1970 - Property Report and Prospectus	52J/ 2 NW
Bell Lake	New Brunswick Uranium and Metal Mines Ltd.		1969 - Prospectus	52G/15 SW
	Santa Maria Mines Ltd.		1969 - Property Report and Prospectus	52G/15 SW
Drayton Tp.	Consolidated Manitoba Mines Ltd.		1970 - Prospectus	52J/ 4 SW
Fourbay Lake	Giant Sturgeon Mining Corp. Ltd.		1970 - Prospectus	52J/ 2 SW
	Matta-King Corp. Ltd.		1970 - Prospectus	52J/ 2 SW
	New Bedford Explorations Ltd.		1970 - Property Report and Prospectus	52J/ 2 SW
Penassi Lake	Ardel Explorations Ltd.		1970 - Property Report and Prospectus	52G/14 NE
S.W. pt. of Sturgeon Lake	Ideal Bay Explorations Ltd.		1970 - Prospectus	52G/14 SE
Sixmile Lake	Amalgamated Beau-Belle Mines Ltd.		1970 - Prospectus	52G/15 NW
	Canadex Mining Corp. Ltd.		1969 - Prospectus	52G/15 NW
	Norlex Mines Ltd.		1970 - Property Report and Prospectus	52G/15 NW
	Sturdy Mines Ltd. and Texmont Mines Ltd.		1970 - Property Report and Prospectus	52G/15 NW
Smock Lake	Falcon Lake Mining Corp. Ltd.		1970 - Property Report and Prospectus	52G/13 NE
	Reeta Exploration Ltd.		1970 - Property Report and Prospectus	52G/13 NE
	Sturgeon King Mining Corp. Ltd.		1970 - Property Report	52G/13 NE
Sturgeon Lake	Noble Mines and Oils Ltd.		1970 - Prospectus	52G/15 NW 52G/14 SW 52J/ 2 SW
South of Sturgeon Lake	Santa Maria Mines Ltd.		1970 - Property Report and Prospectus	52G/15 SW
S.W. pt. of Sturgeon Lake	Matt Berry Mines Ltd.		1970 - Property Report and Prospectus	52G/14 SE

PROPERTY EXAMINATIONS

Atikokan Iron Mines Property (A)

Considerable work has been undertaken by Kemins Explorations Ltd., Paulpic Gold Mines Ltd., and Monteagle Minerals Ltd. in McCaul and Hutchinson Townships to assess the potential of magnetite and sulphide-rich gabbroic intrusions that are located along a major east-west fault.

On the Atikokan Iron Mines property, massive and disseminated zones of sulphides and magnetite occur within a gabbroic intrusion. The mineralization is known to occur along a length of about 3,800 feet and in widths of up to 150 feet. In grab samples taken by Paulpic Gold Mines Ltd. iron ranged from 23.5 to 59.1 percent, copper from 0.01 to 2.2 percent, cobalt 0.01 to 0.11 percent, and nickel 0.01 to 0.12 percent.

The property was brought into production in 1907 and a small amount of iron ore was shipped during the following years, but the ore contained too many impurities of other metals and the operation closed.

Airborne and ground electromagnetic and magnetometer surveys followed by diamond drilling, were carried out during 1969 and 1970 over a considerable area in McCaul and Hutchinson Townships to assess the potential of the area.

Cates Property (B)

An interesting occurrence of zinc, silver, and lead mineralization in Bridges Township has received considerable attention during the past few years. The showings were staked in 1967 by G. Cates and L.A. Tihor, prospectors employed by Noranda Exploration Co. Ltd.

Massive to disseminated sulphides, mainly pyrite, and minor amounts of sphalerite, chalcopyrite, and galena occur in narrow widths of up to one foot along shear zones in a siliceous metasediment. The main zone of mineralization can be traced for about 9,900 feet. Other minor parallel shears in biotite, quartz, feldspar schists and gneisses, in places garnetiferous, contain minor amounts of sulphide. Samples of the more massive sulphides contain as high as 2-1/2 oz. silver per ton, 10 percent zinc, and 5 percent lead, but generally only low values of silver and zinc have been obtained along most of the zone.

Noranda Exploration Co. Ltd. carried out geological mapping, geophysical and geochemical surveys in 1968 and five diamond drill holes were completed on the property in 1969.

Glatz-Kozowy Property (C)

Copper and nickel mineralization has recently been discovered at Prig Lake in the Turtlepond Lake area, by A. Glatz of Dryden. The property has been optioned by Lynx-Canada Exploration Ltd.

The main zone of chalcopyrite and pyrrhotite mineralization occurs within a fractured and sheared gabbro at the contact with felsic volcanic rocks. The exposed zone of mineralization is about 15 feet wide and about 70 feet long. The chalcopyrite and pyrrhotite within the gabbro is mainly disseminated but is locally concentrated along fractures and shears.

A second zone of mineralization, very similar in nature to the main showing occurs about 500 feet to the northeast.

A magnetometer survey has been completed on the property and diamond drilling is planned.

Lantz Property (D)

Copper and nickel mineralization which has been known for some time occurs at Emmons Lake in the Turtlepond Lake area, about 18 miles south-southeast of Dryden.

The sulphides occur as disseminated pyrrhotite, chalcopyrite, and pyrite in irregular patches over an area of about 300 feet by 130 feet. A relatively unaltered gabbroic rock containing inclusions of diorite and andesite is the host rock for the mineralization. A breccia texture characterized by rounded fragments (or inclusions) occurs within the mineralized zone.

Considerable work has been undertaken on the property over the past few years including geological and geophysical surveys and diamond drilling but the work completed to date has failed to extend the zone of mineralization.

Nabish Lake Property (E)

Further work during 1970 was carried out on a copper-nickel property at Nabish Lake, about 10 miles south-southwest of Dryden. The property is held by A. Glatz and A. Kozowy of Dryden.

A bulldozer was used to clear overburden from an area of known mineralization and at least seven additional patches of disseminated chalcopyrite, pyrite and pyrrhotite have been exposed within an area of about 75 feet by 150 feet.

The mineralization which is confined mainly to fragment edges and to fracture and shear planes occurs in an intermediate volcanic breccia which has been invaded by diorite.

Thew Property (F)

Several occurrences of disseminated sulphides have recently been discovered in the Plateau Lake area by Mr. R. Thew of Kawene. The sulphide mineralization noted is present in relatively minor amounts and occurs within relatively small gabbro and coarse-grained pyroxenite sills that have intruded a sequence of sedimentary rocks.

Pyrrhotite, pyrite, and minor chalcopyrite occur mainly interstitial to the mafic silicate minerals and are generally confined to the footwall pyroxene-rich portions of the sills.

Geochemical work in the area underlain by the gabbro sills has resulted in copper, nickel, lead, and zinc anomalies. Although the known mineral occurrences do not represent economic concentrations, careful prospecting may locate larger gabbroic sills which could contain better concentrations of copper and nickel mineralization.

Tudale Mines Limited Property (G)

During the past several years Tudale Mines Ltd. has done considerable work on a uranium property in the Paterson Lake area. The property is located about 38 miles north of Kenora near Oneman Lake.

The property lies within a zone of granites and metasedimentary gneisses which form the English River Gneissic Belt. Several areas of uranium mineralization associated with light grey and pink granitic pegmatite dikes have been outlined. Yellow uranium oxide staining is prevalent along fracture planes and on the surfaces of some of the outcrops. At the main showings radioactivity is confined to an area about 400 feet long and up to 150 feet wide. The highest counts appear to be located along fracture planes, shears, and biotite schlieren.

Considerable trenching has been done on the property and a scintillometer survey was completed in 1969. Diamond drilling was undertaken during 1970 to try to better delineate the radioactive zones.

KIRKLAND LAKE DISTRICT

By

H.L. Lovell

CONTENTS

Kirkland Lake District

Tables

Figures

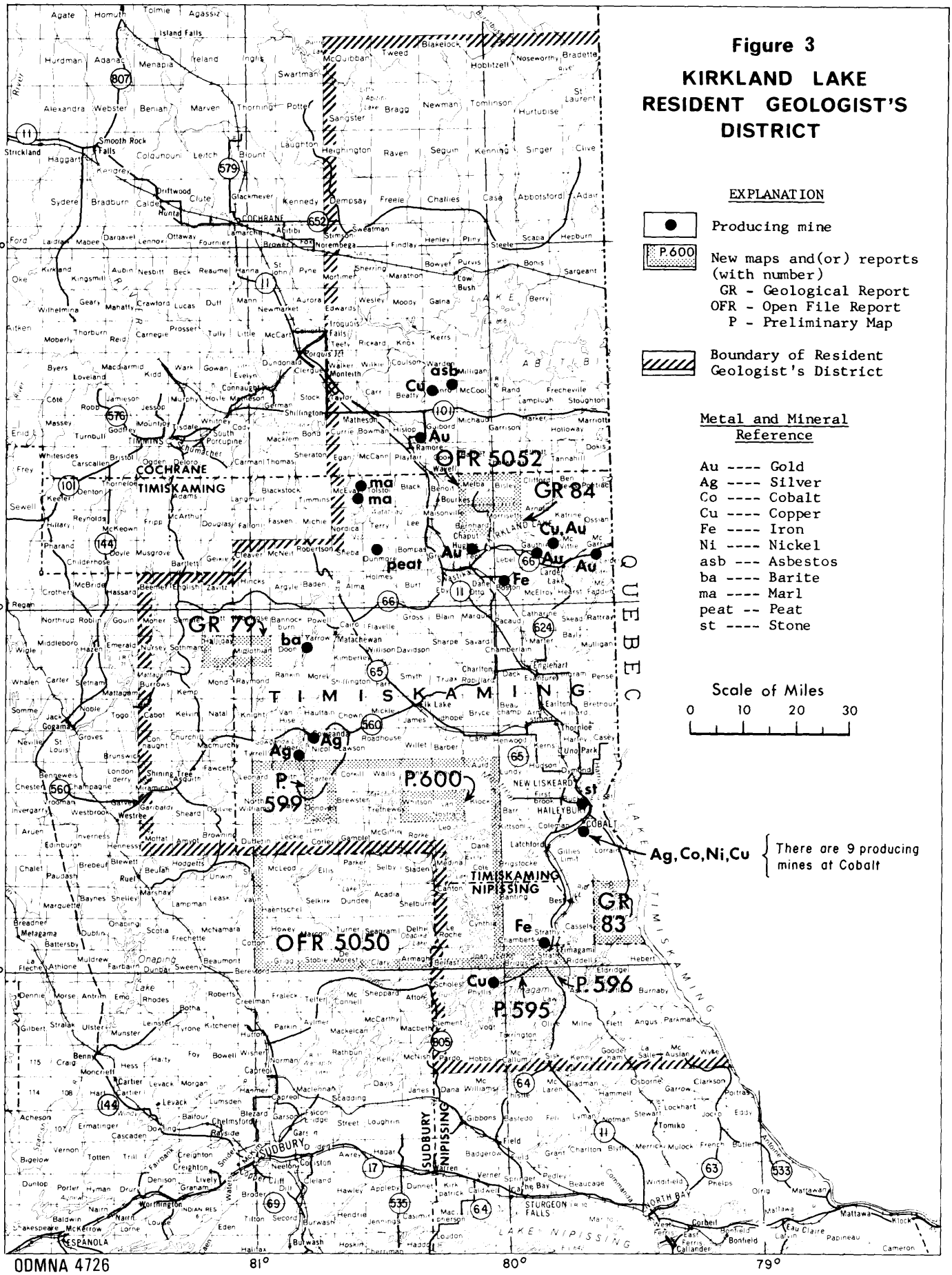


Figure 3
KIRKLAND LAKE RESIDENT GEOLOGIST'S DISTRICT
EXPLANATION
Producing mine
P.600
New maps and(or) reports (with number)
GR - Geological Report
OFR - Open File Report
P - Preliminary Map
Boundary of Resident Geologist's District
Metal and Mineral Reference
Au ---- Gold
Ag ---- Silver
Co ---- Cobalt
Cu ---- Copper
Fe ---- Iron
Ni ---- Nickel
asb --- Asbestos
ba ---- Barite
ma ---- Marl
peat -- Peat
st ---- Stone
Scale of Miles
0 10 20 30
Ag,Co,Ni,Cu
There are 9 producing mines at Cobalt
OFR 5052
GR 84
GR 79
OFR 5050
P.600
P. 599
P. 596
P. 595
GR 83
TIMISKAMING
COCHRANE
NEW LISKEARD
HAILEYBURY
COBALT
TEMAGAMI
SUDBURY
NIPISSING
QUEBEC
ONTARIO
LAKE TIMISKAMING
LAKE NIPISSING
ODMNA 4726
49°
48°
47°
81°
80°
79°

KIRKLAND LAKE DISTRICT

By

H.L. Lovell[1]

INTRODUCTION

The Kirkland Lake office is responsible for the Larder Lake Mining Division. The staff of the Resident Geologist's office consists of a resident geologist, an assistant, and a secretary. The present geological assistant is Edward Frey, who replaced T.W. Caine in April. Mr. Frey's experience includes field mapping and mineral exploration in Ontario.

Duties of the Kirkland Lake Resident Geologist entailed gathering and filing mineral exploration information from private company donations and assessment work and also from various publications; further refinements to the filing system, and improved preservation of documents; discussions of exploration projects with prospectors and geologists numbering, for most of the year, about 6 per day; visiting mines; examining properties; conducting Canadian and foreign university, government, and exploration geologists on tours in the Kirkland Lake and Cobalt areas; participation in a geological field trip to Red Lake; mapping and writing a Summary of Field Work on four townships in the New Liskeard area; writing an annual report; describing selected mining properties for a Geological Survey of Canada study of metal occurrences; working on the revision of the Timmins-Kirkland Lake geological compilation map; compiling a list of Cobalt area rock and mineral samples stored in the Kirkland Lake Resident Geologist's office; writing a Miscellaneous Paper describing the Lake Timiskaming Rift Valley; compiling an up-to-date list of Mineral Exploration Data filed in the Kirkland Lake Resident Geologist's office; further work on "Geology and Scenery in and near the Lake Timiskaming Rift Valley" and on the Lebel Township map and report; editorial corrections of the Bourkes area report and the Eby-Otto-Northern Marquis Townships report; geological descriptions for the Cobalt-Kirkland Lake-Timmins tour of the International Geological Congress in 1972, and composing a field trip for the Kirkland Lake area; mineral exploration classes; speaking about geology to elementary and secondary school children; participation, at meetings and by correspondence, in planning development and land use in the Northeastern Ontario Economic Region; and contributions to groups representing government, educational institutions, and industry carrying out geological and geochemical studies.

In the Larder Lake Mining Division, in addition to the above-mentioned four townships of the New Liskeard area, Pontiac and Ossian Townships (north of Larder Lake), Chambers and Strathy Townships (Temagami), and the Tomiko area (south and southeast of Temagami) were mapped by field parties during 1970. A gravity survey was begun in the Cobalt and Matheson areas, syenitic

---

[1]Resident Geologist, 4 Government Rd. East, Kirkland Lake, Ontario.
Manuscript accepted for publication February 10, 1971.

stocks in the Matachewan and Kirkland Lake areas were surveyed geochemically, and three townships in the Matheson area were surveyed using airborne radiophase.

MINERAL PRODUCTION 1968

The total value of mineral production in the Larder Lake Mining Division in 1968 was $53,845,964. Final figures for 1969 are not available.

Table 6 summarizes metallic and nonmetallic production for 1968.

Table 6 Mineral production in Larder Lake Mining Division, 1968.

		Number of Producers	Quantity	Value (dollars)
Metals*:	gold) silver)	22	321,098 oz. (gold only)	23,529,752 (gold & silver)
	copper) iron) arsenic)	5	853,801 tons**	29,980,834
Nonmetals:	asbestos) sulphur) sand & gravel) clay) limestone)	6	125,568 tons***	335,378
			Total:	$53,845,964

* cobalt and nickel production figures are not available
** excludes tonnage from all copper producers and one iron producer
*** excludes tonnage from all clay producers

MINING ACTIVITY

Unlike Ontario as a whole, 1970 was a period of contraction of mineral production in the Larder Lake Mining Division. Silver production in particular suffered, with the closing of the Glen Lake Silver operations near Cobalt, but gold production in the Kirkland Lake-Larder Lake area also declined.

Cobalt Area

Silverfields Mining Corporation Ltd. continued normal mining and underground diamond drilling exploration, but no mining was done on the property of Silver Summit Mines Ltd.

Agnico Mines Ltd. produced silver ore from the Penn-Canadian and Trout Lake No. 2 shaft properties, and from the Bailey property leased from Glen Lake Silver Mines Ltd. However, during 1970 the Nipissing 407 property and Cobalt Lake tailings recovery project were not operated.

Glen Lake Silver Mines Ltd. and its subsidiary Hiho Silver Mines Ltd. operated until shut down in November 1970. Production of the silver ore was from underground in the Cleopatra, Conisil, and Giroux Lake properties, and from surface dumps on the Crown Reserve and Lawson properties.

Patricia Silver Mines Ltd. produced silver ore from its Nipissing North property. The ore was custom milled by Deerhorn Mines Ltd., as was A. Byberg's surface dump material from the Keeley property, South Lorrain Township, and ore from R.C. McAllister's Buffalo lease.

Chitaroni Minerals Ltd. continued mining silver ore from the Coleman Township "Nipissing" property, which is leased from Agnico Mines Ltd.

Northgate Holdings Ltd. for a period of time reclaimed silver from surface rock dumps on the Violet property, and processed tailings from the Beaver property.

A. Gagne shipped 1,300 tons of limestone from the quarry at Haileybury to Noranda and the Cobalt Refinery.

Gowganda Area

Siscoe Metals of Ontario Ltd. continued mining silver ore and underground exploration on the Miller Lake O'Brien property, as well as on the Castle property of McIntyre Porcupine Mines Ltd. Mining at the Manridge property was terminated in November.

Elk Lake Area

Welsh Silver Mines Ltd. explored the Otisse property by percussion drilling from surface, for sampling purposes, and test milled 200 tons of material mined by surface trenching.

Matachewan Area

Extender Minerals of Canada Ltd. attempted to arrange milling facilities for its stockpile of barite ore, but did no further mining on its property near Mistinikon Lake.

Kirkland Lake-Larder Lake Area

Macassa Gold Mines Ltd. mining and milling averaged only 210 tons per day, with stoping down to the 6,300-foot level and development on the 6,450-foot level. Since November, Macassa has been managed by Upper Canada Mines Ltd. on a profit-sharing basis, and recently shareholders approved the merger of Macassa into Willroy Mines Ltd.

Upper Canada Mines Ltd. continued normal mining and milling of the production of 360 tons of gold ore per day from Upper Canada and 200 tons of copper-gold ore per day from the nearby property of its subsidiary, Upper Beaver Mines Ltd.

Kerr Addison Mines Ltd. mining and milling was reduced to an average of about 1,000 tons of gold ore per day.

Jones & Laughlin Mining Company Limited mined iron ore from two open-pits of its Adams Mine, except during a few days shut down as a result of lower demand for steel during the strike in the auto industry. Previously the pellets were shipped by rail the entire distance to their destinations in steel plants, but during 1970 some of the pellet production was transported from Little Current to Cleveland by lake freighter.

Matheson Area

Hollinger Mines Ltd. continued mining and milling gold ore from its Ross Mine, at about 400 tons per day.

Hedman Mines Limited continued normal mining and milling of its asbestos ore.

Canadian Johns-Manville Company Ltd. completed underground sampling designed to test its asbestos property in Garrison Township for open-pit mining feasibility.

Harrison Drilling and Exploration Company Limited suspended the mining and milling of copper ore at its Potter Mine during shaft deepening to 1,274 feet. When development is completed on the new levels, production is to be resumed.

Temagami Area

Copperfields Mining Corporation Ltd. continued normal mining and milling, and stepped up its exploration program.

Cliffs of Canada continued production of iron pellets from the Sherman Mine, for shipment by rail to the Dofasco steel plant in Hamilton. However production was reduced for several months because of equipment failure in the pelletizing plant.

Canadian Northland Stone Limited produced ornamental stone (mostly various colours of sericitic schist) from a quarry in McAuslan Township.

M.K. Mote produced ornamental stone (mostly "black Granite") from a quarry in LaSalle Township.

Table 7 Property Files (Assessment and other reports) Acquired in 1970

AEM airborne electromagnetometer survey
AM airborne magnetometer survey
DH diamond drill hole(s)
EM ground electromagnetometer survey
Gc geochemical survey
HS hand sample(s)
IP induced polarization survey
Mag ground magnetometer survey
RA radiometric (radioactivity) survey
rTr rock trenching
SP self-potential survey
sTr soil trenching and stripping

Township	Location	Name of property file	Kind of data
Angus	W central pt.	Titan Iron Mines Ltd. also Flett Tp.	see for Flett Tp.
Asquith	NE¼ W pt.	Saville, Albert	sTr Apr.-Aug. 1970
Barr	NW¼ SW pt.	Mark, Howard A. "Mattawapika claims" also Klock Tp.	rTr, adit location, July-Oct. 1969; rTr May 1969
Ben Nevis	NE¼	Beaudry, Raymond	DH 10, Dec. 1969 & location (1" = 660'); rTr Oct. 1968
Benoit	Con. V lot 5 S½	Lukasz, Michal	rTr May-June 1969
Bernhardt	central pt.	Basterache, Gerald; Roberts, P.C.M.	sTr Aug.-Sept. 1969
	SW¼ SW pt.	Scott, Leslie	sTr July 1969
Best	IN 6W, S central pt.	Hopkins, A.; Hopkins, P.	DH 69-1 & 69-2, Nov. 1969, XN's (1" = 10'), & locations (1" = 10'), Dec. 1969; (2) rTr Nov. 1969; (3) rTr Aug. 1970; DH 70-1 to 70-5, Aug.-Sept. 1970; rTr (1" = 400') Aug.-Sept. 1970
	IN 6W S central pt.	Mortimer, Charles H.	rTr June & Sept. 1969; DH 7-68; 8-69; 9 to 11 Nov. 1968-May 1969, & location (1" = 1320'); DH 70-1 to 70-5 & locations Mar.-July 1970
	IN 5W S central pt.	Niemetz, Herbert	DH 9, & location (1" = 200') Aug. 1970
Boston	NE¼ SE pt.	Amax Exploration Inc. "Newman, R.; Mageau, A.; Amax; Allerston, R.; Inco claims" also McElroy Tp.	geol (3) (1" = 300') & rept. by N. Kacira, Aug. 1969; RA (3) (1" = 300') & rept. by S.N. Watewich, Jan. 1970
	SE¼	Shepherd Explorations Ltd.	correspondence, Sept. 1969; DH 70-1 to 70-4, Apr.-May 1970, & locations (1" = 1000'); EM (1" = 200') & brief rept. by J. Duncan Crone, Jan. 1970
Boston	N½ centre pt.	Marshall Boston Iron Mines Ltd.	prospectus Aug. 1970; rTr May 1970
	NW¼ SE pt.	Marshall Boston Iron Mines Ltd.	sTr June-July 1969; rTr Aug.-Sept. 1969
Briggs	S central pt.	Sturdy Mines Limited	Co.'s brief rept. Sept. 1970
	S½	Copperfields Mining Corp. Ltd. also Joan & Strathcona tps.	AEM (1" = 1320') & rept by D.C. Fraser, Apr. 1970
Brigstocke	NE¼ NE pt.	Bohme, J.D.S.; Hamilton, T. "Teshota Nipigon Mines Ltd. opt." also Coleman Tp.	EM, Mag (1" = 200') Jan.-Mar. 1970 & rept. by J.L. Tindale, June 1970
Bucke	Con. I lot 14 S½ NW¼ S pt.	Brown, Theodore D.	DH 1 & 2, May 1970 & locations (1" = 200')
Cabot	SE¼	Gelata, Eldomar "Claw Lake group" (Kennco Expl. (Canada) Ltd. opt.)	EM (1" = 200') & rept. by J.A. Woodward, Mar. 1970; geol (1" = 200') (1" = 200') & rept. by R. van Ingen, May 1970; geol (1" = 200') & rept. by H.W. Fleming, Apr. 1970.
Cairo	SW¼	Sunisloe, George (see also North Expo Mines; Rosmer Corp.)	geol by E.G. Bright
	W central pt.	Metachewan Cons. Mines (Can.) Ltd. "Chowdhury, Q.Z.; Merko N. claims" also Powell Tp.	EM (2) (1" = 200') & rept. by F.A. Innes, Feb. 1970; group location (2" = 1 mi); geol (4" = 1 mi)
Cairo	N½ central pt.	Hill, Robt. A. (Extender Minerals of Canada Ltd.)	DH 1 & 70-2, Oct. 1970 & locations

Township	Location	Name of property file	Kind of data
Casey	Con. I & II lot 8	Wabi River Syndicate "SII claims"	EM (1" = 200') & rept. by G.J. Gereghty, Dec. 1969
	Con. I lots 5-7	Langis Silver & Cobalt Mining Co. Ltd. also Harris Tp.	rept by J.E. Jerome, Jan. 24, 1969
Cassels	SW¼	Wabi River Mining Syndicate "Wabi Cassels prop."	DH WC-1 to WC-5, Jan.-Feb. 1970; geol (1" = 200'); DH XN's WC-1 to WC-5 & rept by Chris J. Sampson, Feb. 1970
Catharine	Con. I lot 1 S½ NE¼ SE¼ lot 2 N½ NW¼ pt.	Diamond Geophysical, Inc.	see under Gauthier Tp.
	Con. II lot 2 S½		
	Con. V lot 1 N½ lot 2 N½ SE¼ N pt		
	W½	Moncrieff Uranium Mines Limited	rept by L.J. Cunningham, May 1970; claims map with location map
Chambers	SE¼ SE pt.	Blake, Frederick	rTr Jan. 1970
Churchill	SE¼ SE pt.	McBride, William W.	rTr, sTr June-Oct. 1970
Coleman	Con. V lot 8 S½ SE¼	Craig, McConnell	DH CR-69-4 to CR-69-8, July & Aug. 1969 & location (1" = 1320')
	Con. II lots 18 19 N pt.	Campbell, John	sTr May-Aug. 1970;
	Con. III lot 19 S½ SW¼	Campbell, John	sTr June-Aug. 1970
Connaught	NE¼ SW pt.	Coniston Copper Mines Limited	rept by D.S. Robertson, Mar. 29 1970
Currie	Con. II lot 1 S½ NW¼	Turney, Walter J.	DH 1, May-June 1968; DH 2, May-June 1970, & location (1" = 330'); core; EM (1" = 200') & rept by A.L. Parres, June 1965
Cynthia	NE¼ NW pt.	Hardie, Arnold A.	rTr May, July-Sept. 1969
Dack	Con. VI lot 5	Gilpin, Harold D.	sTr June 1970
Eby	Con V lot 1 S½ NW¼	Pain, S.A.	sTr July-Oct. 1969 to May-June 1970; June-Aug. 1970; sTr Aug.-Oct. 1970
Fawcett	SE¼	Raylloyd Mines & Explorations Ltd. also Oglivie Tp.	Co. prospectus, Jan. 1970
Flett	E central pt.	Titan Iron Mines Ltd. also Angus Tp.	rept by D. Owens, July 1968 (Dept. E.M.R.)
	S½ central pt.	Nichol, W.H.	DH 1, Mar. 1970
Gauthier	SW¼ SE pt.	Diamond Geophysical, Inc. also Marter, Catharine & McElroy Tps.	Mag, Gc (1" = 200'), Aug.-Dec. 1968, Feb. 1969, & rept by S.S. Szetu, Feb. 1969
	SE¼	Gudrie, Thomas	rTr Oct.-Nov. 1969; June-Oct. 1970
Gillies Limit	Bl. 34 35 & 24	Murgor Explorations Ltd.	summary rept by J.P. Thoday, May 1969
	Bl. 53	Coy, Edward A.	rTr Oct.-Nov. 1969; sTr & rTr July 1970
	Bl. 53, 62	Cigien Investments Ltd. also Lorrain Tp.	DH C-69-1 to 4; C-69 12 to 14, Apr.-June, Oct.-Nov. 1969 & locations (1" = 1320')
Gillies Limit	Bl. 4 N central pt.	Nielsen, Julius	sTr (1" = 400') Sept.-Oct. 1969; sTr (2) May-Aug. 1970
	Bl. 14, 16	Plaskett, Gordon	DH 9 to 11, Nov. 1959 & location (1" = 200')
	Bl. 22, 23, 32, 33	Santa Maria Mines Ltd.	Co. prospectus, Feb. 1970; prospectus Nov. 1970
	Bl. 34 SE¼ E½	Craig, McConnell	DH B-68, 69-2, Oct. 1968-Apr. 1969 & locations (1" = 1320'); DH 70-1 to 70-5, May-July 1970 & locations (1" = 330')
	Bl. 8	McGerry, John; Robinson, Osie	DH J1, JN 1, JY-2 to JY-4; DH Aug. 1 to Aug. 3, June-Aug. 1969 & locations; XN's (1" = 30'), (1" = 40') & (1" = 50'); assays Aug. & Nov. 1969
	Bl. 17	Niemi, Walter	DH G-17-1, May 1970 & location (1" = 200')
Harris	Con. VI lots 5 & 6	Langis Silver & Cobalt Mining Co. Ltd. also Casey Tp.	see for Casey Tp.
Haultain	NE¼ E pt.	Gowganda Silver Mines Ltd.	Mag, EM (1" = 200'), Apr. & Aug. 1969 1969 & rept by S.S. Szetu, Oct. 1969

Township	Location	Name of property file	Kind of data
Hearst	SW¼ NW pt.	Barker Mining Syndicate also McElroy Tp.	rTr Aug.-Sept. 1968
	SE¼	MacGregor, R.A. also McVittie Tp.	DH M-1, M-2, Feb.-Mar. 1970, EM, Mag (1" = 200') & rept by H. Stewart, Mar. 1970; rTr Aug. 1970
Hudson	Con. VI lot 12	Armstrong, Roy	rTr May 1969
Hurtubise	NE ¼	Canadian Superior Explorations Ltd.	EM (3) (1" = 2640') & (1" = 200') & rept by Michael Lewis and R.A. Bosschart, May 1969
Joan	SE¼	Copperfields Mining Corp. Ltd. also Briggs & Strathcona Tps.	see for Briggs Tp.
Katrine	SE¼ SE pt.	Riber, Steve	sTr Sept.-Oct. 1969
	central pt.	Lowe-Katrine	DH 1, June 1969 & location (1" = 200'); EM (1" = 200') & rept by Fenton Scott, Apr. 1969
Klock	NE¼ SE pt.	Mark, Howard A. "Mattawapika claims" also Barr Tp.	see for Barr Tp.
Knight	SW¼	Timiskaming Nickel Ltd. also Tyrrell, Natal, Raymond, MacMurchy & Kelvin Tps.	rTr Jan.-Sept. 1969
Lawson	NE¼	Pollock, John	DH 1, Sept. 1970 & location (1" = 330'); sTr Sept. 1970
Lebel	SE¼	Gudrie, Thomas	sTr May-Nov. 1969
	SE¼ NE pt.	Gudrie, Thomas	sTr Aug. 1969; sTr June 1970
	SW¼ SW pt.	Nucleonic Mines Ltd. (see also Dane Copper Mines; Labine, M.)	DH H-1 to H-6, Dec. 1969-Jan. 1970 & rept by S.A. Pain, Jan. 1970 & location (1" = 100')
	SW¼ SW pt.	Gray, James J.	DH H-2, Dec. 1969
	NW¼ NW pt.	Deloye, E.E.	rTr Apr. 1970
Lebel	NE¼ SW pt.	Deloye, E.C.	rTr June 1970; rTr Aug. 1970
	SE¼ NE pt.	Mayhew, George S.	sTr June-July 1970
	NE¼ SE pt.	Kaplan, Nathan	rTr May-June 1970
	SE¼	Sullivan, Thomas	rTr Sept. 1970
	SE¼	Tamminen, Tolva J.	rTr June-July 1970
Lorrain	Con. III lot 2 S½ SE¼	Cigien Investments Ltd. also Gillies Limit Bl. 53, 62	DH C-69-5 to C-69-11, Sept.-Oct. 1969 & locations (1" = 1320')
	Con. II lot 5 N½ SE¼ & SW¼	Cominga (La Compagnie Miniere de L'Ungava Limitee)	prospectus, Feb. 1970; rept by H.H. Sutherland, Nov. 1969
Lundy	Con. IV-VI lot 1-5	Lundy Tp.	brief geol rept by J.G. Williams, 1969
Maisonville	Con. IV lot 4 N½ SW¼	Kerr Addison Mines Ltd. "Goose Lake group"	DH 69 G.L. 6, Apr. 1969 & location (1" = 400')
Marter	Con. VI lot 1 N½ E pt.	Diamond Geophysical Inc. also Catharine, McElroy & Gauthier Tps.	see for Gauthier Tp.
	Con. VI lot 6	Mid-North Engineering Services Ltd.	DH MN-1, July-Aug. 1970 & location (1" = 400')
Michaud	Con. IV lot 3 & Con. V lots 5, 6, 8	Renzy Mines Ltd. (see also Minefinders Ltd.)	DH 3 to 12, Nov. 1969-Apr. 1970 & location (1" = 500')
Mickie	NE¼	Cameron, J.A.	sTr, rTr Sept.-Oct. 1969 to May-July 1970
Milner	SE¼ SE pt.	Decker, Albert	sTr & rTr (3) May-June & Nov. 1969
	SE¼ NE pt.	Pope, Alex. R.	rTr Aug. 1969; rTr May 1970
	NE¼ SE pt.	Sutherland, Don	DH 3, June 1969; DH 5, July 1970 & locations; DH 5, Aug. 1970 & locations
		Deloye, Ernest C.	
Morrisette	SW¼	Deloye, Ernest C.	rTr Aug. 1970
McAuslan	NE¼ NE pt.	Iron City Mines Ltd. also Parkman Tp.	see for Parkman Tp.
	SE¼ NE pt.	Haberer, Joseph	rTr Sept.-Oct. 1969; rTr Aug. 1970
	SW¼ & SE¼ NE pt.	Mote, Gary M.	sTr Sept.-Nov. 1969; sTr & rTr Oct. 1969 & May 1970

Township	Location	Name of property file	Kind of data
McCann	Con. V lot 8 N½ NE¼	Taylor, Benjamin	DH 4, May-June 1970, & location; DH 2, Sept. 1970 & location
McElroy	NW¼ SW pt.	Amax Exploration Inc. also Boston Tp.	see for Boston Tp.
	NW¼ NE pt.	Diamond Geophysical Inc. also Catharine, Gauthier & Marter Tps.	see for Gauthier Tp.
	SE¼ NE pt.	Barker Mining Syndicate also Hearst Tp.	see for Hearst Tp.
	NW¼ NE pt., SE pt.	Erickson, Raymond "A & B properties"	microscopic & beneficiation repts by R.A. Erickson, Sept. 1968; correspondence May 1968 & July 1970; sTr Aug. 1969; sample locations (1" = 200'), June 1970
McGarry	NW¼ NE pt.	Twentieth Century Exploration "Essberger, J. claims"	Mag, EM (1" = 400'), Jan. 1970 & rept by P.T. George, Feb. 1970
MacMurchy	NE¼ SE pt.	Madsen Red Lake Gold Mines Ltd. also Tyrrell Tp.	DH 1 to 5; 6A; 6B; 7 to 9, June-July 1969, & location (1" = 200'); EM (2), Mag (1" = 200'), Mar. 1969 & rept by F.A. Innes, June 1969
	SW¼	Mayflower Mines Ltd. "groups 1 to 3"	Mag (2) (1" = 400'), May 1970; geol (1" = 400'), May 1970; EM (1" = 400'), May 1970 & rept by H.H. Sutherland, June 1970
McVittie	SW¼ SE pt.	Clark, Alexander H.	DH, Sept.-Oct. 1969
	NE¼ SW pt.	Bustraen, Michel	DH 1 & 2, June-Oct. 1969; rTr Aug.-Sept. 1969; rTr May 1970
	SE¼	MacGregor, R.A. also Hearst Tp.	see for Hearst Tp.
	SW¼	Bustraen, Remi	rTr May-June 1970
	NE¼ SE pt.	Smith, Lyman	sTr July-Nov. 1969
Newman	SW¼	Summit Explorations & Holdings Ltd.	rept on properties by G.L. Kirwan, July 1970; prospectus Sept. 1970
Nicol	5N 5W, 6N 5W	The Big Four (McDougal R; see also Tego Silver Cobalt Mines; Rominco Mines)	sTr 1970
Ogilvie	NE¼	Raylloyd Mines & Explorations Ltd. also Fawcett Tp.	see for Fawcett Tp.
Ossian	SE¼ NW pt.	Twentieth Century Exploration "Paquette, G. group"	DH 1, Feb. 1970, & location (1" = ½ mi); Mag (2), EM (3) (1" = 400') & repts by P.T. George, Jan. 1970
	N central pt., SE¼	Paquette, G.; Essberger, J. also Pontiac Tp.	EM (1" = 400') & rept by P.T. George, Nov. 1969
Otto	Con. IV lot 12	Gudrie, Thomas	sTr May-Nov. 1969
	Con. V lot 12, N½ NE¼	Gudrie, Thomas	rTr Oct.-Nov. 1969 to May-July 1970
	Con. V lot 10 NE½, S½ NE¼	Stewart, Wilfred	sTr (3) Sept. 1969-Aug. 1970
		Sullivan, Thomas	rTr July 1970
	Con. V lot 11	Tamminen, Toivo V.	rTr Aug.-Sept. 1970
Pacaud	Con. VI lot 3	Bargnesi, Alfio	DH, Oct.-Nov. 1969
	Con. VI lots 4-6	Royal Valley Copper Mines Ltd.	Mag, EM, geol (1" = 200') & rept by Hugh H. Sutherland, June 1969
	Con. VI lot 2 S½ NE¼	Bargnesi, Alfio	sTr, rTr Sept.-Oct. 1969
Pardo	NE¼ W pt.	International Kenville Gold Mines Ltd.	Mag, ra (1" = 200') & rept by L.A. York, June 1969
Parkman	SE¼ SW pt.	Iron City Mines Ltd. also McAuslan Tp.	DH 69-1, Nov. 1969, & location (1" = 200'); rTr (2), Nov. 1969; Mag (1" = 200') & rept by A. Hopkins, Dec. 1969
Pense	Con. V lot 9 N½ SE¼	Gereghty, Gerald J.; Waddell, Lloyd A.	DH 5, Mar.-Apr. 1969; XN (1" = 20') & location; DH 10 to 13, Apr. 1970, & locations (1" = 50')
	Con. V lot 10 S½ SW¼	Rio Tinto Canadian Exploration Ltd.	drill core
	Con. III lot 7 NE¼ & S½, 7 & 9 N½; Con. IV lot 8 S½ & N½ SW¼ & SE¼	Wabi River Mining Syndicate	EM & Mag (1" = 200') Mar. 1970
Phyllis	NE¼	Copperfields Mining Corp. Ltd. "Island 203"	DH 867, 868, 868A, 878, 879, Feb.-Mar. 1970, & locations & true sections (1" = 100')

Township	Location	Name of property file	Kind of data
Pontiac	S central pt.	Paquette, G.; Essberger, J.	see for Ossian Tp.
Powell	SE¼ W pt.	British Matachewan Gold Mines Ltd.	DH 1–1969, Oct.–Dec. 1969
	SE¼ pt.	Brookbank, W.; Evoy, N.; Hansen, A.	geol by E.G. Bright
	E central pt.	Chowdhury, Q.Z.; Marko, N.	see for Cairo Tp.
Riddell	SW¼ SW pt.	Schubert, Irwin	rTr (2) Apr.– May & July 1970
Saint Laurent	SE¼	Asarco Exploration Co. (Canada) Ltd.	EM, Mag (1" = 400') & rept by H.J. Bergmann June 1970
		"Gray property"; "Patten River Project"	
Skead	Con. IV lot 4 NE¼	Jack, Arnold H.	sTr nov. 1968–May 1969
	Con. V lot 4 S½ SE¼ & NE¼		
	Con. V lot 5 S½ SW¼	Jack, William Joseph	rTr May 1969
Sothman	SW¼ NW pt.	Decker, Albert	sTr & rTr (2) Aug. 1969; DH 1 & 2, Aug.–Sept. 1969
	N½ central pt.	Canex Aerial Exploration Ltd.	DH 119–1 & 119–3, May–July 1970 & locations
Speight	SE¼	Stanwick, Steve	rTr (1" = 50') July–Aug. 1970
Strathcona	E½ central pt.	Graber, Karl	Mag (2) (1" = 200') & rept by Ben W. Chechak, May 1969; sTr Aug.–Sept. 1970
	SE¼ SE pt.	Johnston, Harold O.	sTr, rTr July–Dec. 1969
	N½	Copperfields Mining Corp. Ltd. also Briggs & Joan Tps.	see for Briggs Tp.
Strathy	SW¼ SW pt.	Blake, Frederick	Mag, EM (1" = 100') & rept by F. Blake, Aug. 1969; rTr Mar. 1970
	NW¼ SE pt.	MacVeigh, E.L.	DH 1 & 2, Sept. 1970, & locations (1" = 1320'); rTr Nov. 1968–Jan. 1969, & May–Aug. 1970
	SE¼	Morrison, Wm. F.	geol (1" = 200') & rept by W.F. Morrison, July 1970
Taylor	Con. III lot 6 N½ SW¼	Turney, Walter	DH 3 Aug. 1970, & location
Teck	NW¼ NW pt.	Scott, Leslie	rTr (1" = 200') & (1" = 1320'), June 1969–May 1970
	SW¼	Deloye, Ernest C.	rTr (2) Aug.–Sept. 1970
	NE¼ SW pt.	Westwind Explorations Ltd.	soil sampling sketch, Apr. 1966
	SW¼	Hudson Bay Mines, Ltd.	geol & assays (1" = 30') (3) Mar. 1936; drainage tunnel (1" = 400')
Tudhope	Con. lot 12 S= SE¼	Welsh, George S.	sTr Oct. 1969
	Con. III lot 7 N½ SW¼; S½ NW¼; lot 8 S½ NE¼	Venne, Edgar	DH July 1969 & rTr June 1969
Tyrrell	NW¼	Madsen Red Lake Gold Mines Ltd. also MacMurchy Tp.	see for MacMurchy Tp.
	S central pt.	Bruno, Henry	rTr (1" = ¼ mi) May–July 1970
Vogt	S central pt.	Wright, Robt. J. (Keevil Mining Group Ltd.) "Pascar opt."	Mag, EM, geol (1" = 200') & rept by R.J. Graham, Feb. 1970
Whitson	NE¼ SE pt.	Argentium Silver Mines Ltd.	rTr Nov. 1969–Feb. 1970; DH Feb.–Aug. 1970
Wilkie	Con. II lot 10 S½ NW¼ SE pt	Hecla Mining Company of Canada Ltd.	DH 1, Apr. 1970, & location (1" = ½ mi)
Wyse	NW¼	Haberer, Joseph	rTr Oct. 1969–May 1970
Yarrow	NE¼	Legacy Mines Ltd.	sTr (2) June–July 1970
Yates	NW¼	Copperfields Mining Corp. also Briggs, Joan & Phyllis Tps.	see for Briggs Tp.

MAPS AND PUBLICATIONS RECEIVED IN 1970

Andrews, R.H., and West, F.J.
1970: Maintenance of large shovels and drills; CIMM Bull. Vol. 63, p.582-585.

Barager, W.R.A., and Goodwin, A.M.
1969: Andesites and Archean volcanism of the Canadian Shield, p.121-142 in Proceedings of the Andesite Conference, A.R. McBirney, editor; International Upper Mantle Project, Scientific Rept. 16; State of Oregon, Dept. Geology and Mineral Industries, 193p.

Bennett, G., and McNally, N.K.
1970: Briggs Township, District of Timiskaming [Nipissing]; Ontario Dept. Mines, Prelim. Geol. Map P.595, scale 1 inch to 1/4 mile. Geology 1969.
1970: Strathcona Township, District of Timiskaming; Ontario Dept. Mines, Prelim. Geol. Map P596, scale 1 inch to 1/4 mile. Geology 1969.

Bolton, T.E.
1970: Echinodermata from the Ordovician and Silurian of Lake Timiskaming region, Ontario and Quebec, p.59-66 in Contributions to Canadian paleontology; Geol. Surv. Canada Bull. 187, 123p. and plates.

Boyum, B.H., and Hartviksen, R.C.
1970: General geology and ore-grade control at the Sherman Mine, Temagami, Ontario; CIMM Bull. Vol. 63, p.1059-1068.

Bright, E.G.
1970: Geology of Halliday and Midlothian Townships, Districts of Sudbury and Timiskaming; Ontario Dept. Mines, GR79, 33p. Accompanied by Map 2187, scale 1 inch to 1/2 mile.

Card, K.D., McIlwaine, W.H., and Meyn, H.D.
1970: Operation Maple Mountain, Districts of Timiskaming, Nipissing and Sudbury; Ontario Dept. Mines and Northern Affairs, Open File Rept. 5050, 275p. and 4 maps.

Doig, R.
1970: An alkaline rock province linking Europe and North America; Can. J. Earth Sci., Vol. 7, No. 1, p.22-28.

Douglas, R.J.W.
1970: Nickel in Canada; Geol. Surv. Canada, Map 1258A.

Eakins, P.R.
1961: Cylindroidal jointing in diabase at Gowganda, Ontario; Geol. Assoc. Canada Proc., Vol. 13, p.85-93.

Fryer, B.J.
1970: Canadian Precambrian iron formations: their ages and trace element compositions, p.106-113 in Variations in isotopic abundances of strontium, calcium, and argon and related topics; Dept. of Earth and Planetary Sciences, Mass. Inst. Tech., Cambridge, Mass., MIT-1381-18, 18th Ann. Prog. Rept. for 1970, U.S. Atomic Energy Comm. Contract AT(30-1)-1381.

Gibb, R.A., van Boeckel, J.J.G.M., and Hornal, R.W.
1968: A preliminary analysis of the gravity anomaly field in the Timmins-Senneterre Mining areas; Dom. Observatory, Gravity Map Series, 25p. and 2 maps.
1970: Three-dimensional gravity interpretations of the Round Lake batholith, northeastern Ontario; Can. J. Earth Sci., Vol. 7, No. 1, p.156-163.

Grant, J.A.
1964: Rubidium-Strontium isochron study of the Grenville front near Lake Timagami, Ontario; Science, Vol. 146, p.1049-1053.

Halls, C., and Stumpfl, E.F.
Geology and ore deposition, western Kerr Lake arch, Cobalt, Ontario; p.241-284.

Hewitt, D.F.
1963: The Timiskaming series of the Kirkland Lake area; Can. Mineral, Vol. 7, p.497-523.

Jensen, L.S.
1970: Geology of Melba and Bisley Townships, District of Timiskaming; Ontario Dept. Mines and Northern Affairs, Open File Rept. 5052, 41p. and 2 maps.

Lovell, H.L.
1970: Kirkland Lake District, p.1-15 in Ontario Dept. Mines Ann. Rept. of Resident Geologists' section, pt.3, MP35, 41p.
1970: Mineral exploration data filed in the office of the Kirkland Lake Resident Geologist to March 1970; Ontario Dept. Mines, Open File Rept. 5044, 190p.

Lovell, H.L., and Caine, T.W.
1970: Lake Timiskaming Rift Valley; Ontario Dept. Mines, MP39, 16p.

Mathieu, G.I.
1966: Recovery of gold from old mill tailings for M.S.M. Minerals Ltd., Kirkland Lake, Ontario; Can. Dept. Energy, Mines and Resources, Mines Branch Investigation Rept. IR67-14, 13p.

McIlwaine, W.H.
1970: Geology of South Lorrain Township, District of Timiskaming; Ontario Dept. Mines and Northern Affairs, GR83, 95p., 3 maps and sections.

MacRae, K.D.
1969: Ultramafic intrusions of the Abitibi area, Ontario; Can. J. Earth Sci., Vol. 5, No. 2, p.281-303.

Parsons, M.L.
1970: Groundwater movement in a glacial complex, Cochrane District, Ontario; Can. J. Earth Sci., Vol. 7, No. 3, p.869-883.

Pye, E.G.
1970: Summary of field work, 1970, by the Geological Branch; Ontario Dept. Mines and Northern Affairs, MP43, 96p.

Pyke, D.R., and Middleton, R.S.
1970: Distribution and characteristics of the sulphide ores of the Timmins area; Ontario Dept. Mines, MP41, 24p. and 1 map.

Ridler, R.H.
1970: Relationship of mineralization to volcanic stratigraphy in the Kirkland-Larder Lakes area, Ontario; Geol. Assoc. Canada Proc., Vol. 21, p.33-42.

Rupert, R.J., and Lovell, H.L.
1970: Geology of Bernhardt and Morrisette Townships; Ontario Dept. Mines, GR84, 27p. Accompanied by Map 2193, scale 1 inch to 1/2 mile.

Symons, D.T.A.
1970: Paleomagnetism of the Nipissing diabase, Cobalt area, Ontario; Can. J. Earth Sci., Vol. 7, No. 1, p.86-90.

Wolfe, W.J., and Wright, G.R.
1970: Biogeochemical distribution of cobalt in second year aspen twigs, Charters and Donovan Townships, District of Timiskaming; Ontario Dept. Mines, Prelim. Geochem. Map P.599.
1970: Biogeochemical distribution of cobalt in second year aspen and birch twigs, Whitson and Van Nostrand Townships, District of Timiskaming; Ontario Dept. Mines, Prelim. Geochem. Map P.600.

GEOLOGY OF THE COBALT-KIRKLAND LAKE AREA

The Cobalt-Kirkland Lake area is at the heart of the largest "greenstone" belt in the Canadian Precambrian Shield, and contains abundant outcrop, a wide variety of rock types, and also a well-mapped, substantially complete Archean stratigraphic column representing an entire orogenic period and some epeirogenic events. The Cobalt-Kirkland Lake area also is in the heartland of the world's most productive mining region, the part of the Canadian Precambrian Shield extending for a distance of 450 miles from Elliot Lake and Sudbury, Ontario to Noranda and Chibougamau, Quebec. Mineral products in the Cobalt-Kirkland Lake area are the most diverse of any mining area in Canada, having included silver, cobalt, bismuth, antimony, arsenic, gold, iron, zinc, lead, molybdenum, tungsten, platinum, asbestos, barite, lime, marl, peat, building stones, ornamental stones, semi-precious stones, brick, clay, sand, gravel, and the abundant fresh water used for municipal and industrial supplies, generating hydro-electric power, etc. For the purpose of aiding mineral exploration, therefore, a summary of the area's geology is presented below, incorporating recent accumulations and re-interpretations of data.

The Precambrian rocks of the Cobalt-Kirkland Lake area were formed during two distinct geological eras, the Archean and the Proterozoic. The Archean rocks form part of the "Abitibi" belt (Goodwin 1966), the largest area of predominantly stratified Archean rocks in Ontario. They consist of meta-volcanics, immature flysch-type metasediments (Goodwin 1968, p.13), and intrusive rocks including felsic stocks and batholiths and mafic to ultra-mafic sills and small stocks. The felsic stocks and batholiths, dated at

2,368 (Fairbairn et al. 1966, p.142) to 2,605 m.y. (Lowdon et al. 1963, p.91), have acted as buttresses around which the stratified formations are isoclinally folded. All other types of Archean rocks are cut by generally north-trending Matachewan diabase dikes (dated at 2,485 m.y. by Fahrig and Wanless 1963). The Proterozoic rocks form part of the "Cobalt Plain" (Lowdon 1961, p.110), the largest area of Proterozoic sedimentary rocks in Ontario.

In the Cobalt area, the sedimentary rocks of the Cobalt Plain are of the Gowganda and Lorrain Formations. The Gowganda Formation is made up of lithified glacial and glaciolacustrine deposits (Lindsey 1969) and the Lorrain Formation is composed predominantly of mature shelf-type sediments (Goodwin 1968, p.13). These formations form the Cobalt Group, which consists of conglomerates, arkoses, quartzites, and argillites. In the Cobalt area, rocks of the Cobalt Group have not undergone widespread folding, although they are drag folded in some places along faults, and in some places have been disturbed during intrusion by late mafic dikes and sheets, chiefly Nipissing Diabase. All the above-mentioned types of Proterozoic rocks are cut by dikes of the northeast-trending Keweenawan "Abitibi" swarm (Fahrig et al. 1965) dated at 1,230 m.y. (Fahrig and Wanless 1963).

A Paleozoic outlier fills a part of the Lake Timiskaming Rift Valley (Lovell and Caine 1970) extending northwest from the northern part of Lake Timiskaming. The outlier, 140 miles from the nearest large area of Paleozoic rocks (on the north shore of Lake Huron), was described by Hume (1925) as being made up of Ordovician and Silurian limestone, shale, sandstone, and dolomite.

Kirkland Lake Area

Kirkland Lake is in the central segment of an original volcano-tectonic basin of the Abitibi belt of Archean rocks. The three principal units of the volcano-tectonic basin are: 1) a southern, older unit composed largely of volcanic rocks that were extruded onto a stable shelf (Ridler 1969, p.12); 2) a central, structurally highly disturbed unit consisting of a wide complex of metavolcanics, metasediments, and intrusive rocks and characterized by abundant syenite, trachyte, and iron formation (this unit constitutes the mobile belt); 3) a northern unit, essentially a synclinorium, that is composed mainly of mafic to felsic volcanic rocks deposited in deep water. Most mines of the Kirkland Lake area occur in the mobile belt (Goodwin 1967, p.136).

In the vicinity of Kirkland Lake, almost all metal production (which includes gold, silver, copper, and iron) has been from one or more of two characteristic rock types; (a) syenite, much of it porphyritic, and related trachyte, and (b) iron formation in its three facies (sulphide, oxide, and carbonate). Typical of the gold-silver deposits are those on contiguous properties controlled by Upper Canada Mines Ltd. The Upper Canada ore is in a volcanic pile consisting principally of syenitic feeders occupying the vents, and nearby related trachytic flows, tuffs, and agglomerates (Tully 1963, p.66). Most of the ore is in quartz veins and red, hematite-stained syenitic wall-rocks. Some ore, however, is in bedded trachyte tuff containing no quartz whatsoever ("syngenetic" gold ore), and some gold-bearing material is in low-grade iron formation of the sulphide and carbonate facies. In Kirkland Lake, seven

companies mined parts of a volcanic pile, principally the syenitic neck. The high-grade gold ore of the Kirkland Lake mines was formed in fractures and fault zones or "breaks" such as the Kirkland Lake Main Break, in structurally competent rocks (Thomson 1948, p.26-33). At the Kerr Addison gold mine, 20 miles east of Kirkland Lake, the ore is contained in dacite flows and tuffs and carbonate rocks that probably constitute the sulphide and carbonate facies of iron formation (Ridler 1969, p.96). Remobilization during folding and faulting (the Larder Lake Fault zone) has reconstituted original low-grade gold-bearing material and formed the Kerr Addison high-grade gold ore.

North of Kirkland Lake, from the area of Highway 11 east to the Noranda district, are rocks corresponding to the Blake River Series (Ridler 1970, p.36). Near Highway 11 are basal mafic metavolcanics, and they grade eastward through predominantly intermediate metavolcanics to rhyolitic volcano centres in Ontario and Quebec, of which the Noranda copper-zinc-gold area comprises the largest and best known.

Between Larder Lake and Englehart are rocks of a major volcanic cycle, its basal parts being mafic and intermediate metavolcanics intruded by differentiated peridotite, gabbro, diorite, and pink feldspar porphyry sills. Middle parts of the cycle consist mainly of intermediate metavolcanics, and upper parts contain some rhyolite pyroclastics and peridotite. This volcanic cycle corresponds approximately to the first cycle illustrated by Ridler (1970, p.34), who pointed out that it is a homoclinal sequence 57,000 feet thick (Ridler 1970, p.36). The sequence, possibly excluding Ridler's "Pacaud tuffs", and in its upper parts including some of the metasediments to the north, seems to represent one complete volcanic cycle as described by Goodwin (1965, p.95). It would be the world's thickest known single Archean volcanic cycle exposed in the almost true vertical section provided by a steeply dipping homocline. The environment of deposition seems to be a "stable shelf" (Ridler 1970, p.36), the rocks of which are virtually undeformed.

Nickel Deposits in Archean Ultramafic to Mafic Rocks

Associated spatially with the upper, felsic strata of the major volcanic cycle, as described above, are subconcordant ultramafic to mafic lenses. The common occurrence of ultramafic rocks in felsic strata (Pyke and Middleton 1970, p.2), in which the sulphide (and other) facies of iron formation is normally interbedded, provides many good exploration targets for base metals, as exemplified by Noranda's new nickel mine being developed southeast of Timmins.

The Noranda nickel mine and the developing Texmont Mine, south of Timmins, are in a type of nickel mineralization heretofore generally regarded as uneconomic. They consist of disseminated and minor massive nickel-bearing sulphides in or near "Haileyburian" ultramafic to mafic intrusive rocks, with most of the nickel in pentlandite and millerite. The nickel content is rather low, technological improvements and an increased price for nickel having put it in the category of ore. The ultramafic to mafic host rock is magnetically anomalous. However some of the ore is not electromagnetically very responsive, the sulphides being disseminated; therefore some ore zones tend to escape detection.

The ultramafic source rocks of the above type of nickel ore might have originated in one or both of two ways: as parts of a younger volcanic cycle, but usually intruded into the upper, felsic strata of the underlying volcanic cycle; or as ultramafic residues of a differentiation series culminating in rhyolite (Lovell 1970, p.7). The presence of nickel deposits associated with the Archean ultramafic rocks could be explained by two mechanisms: gravity separation of immiscible sulphide liquid in the ultramafic magma, and reaction of nickel from ultramafic material with sulphur from host rocks such as the sulphide facies of iron formation (Pyke and Middleton 1970, p.15).

Cobalt

The Cobalt mining camp is in the southeastern part of the Cobalt Plain, where the maximum known thickness of Proterozoic formations is about 700 feet and many inliers of Archean rocks are exposed. In one such inlier is the Sherman iron mine at Temagami, and all the known silver ore of Cobalt is near the Archean-Proterozoic unconformity, within 700 feet of the Nipissing Diabase.

The silver ore is in calcite and dolomite veins cutting Proterozoic sedimentary rocks, Archean rocks, and Nipissing Diabase. The veins fill fractures and faults, some of which probably were caused by the intrusion of Nipissing Diabase. Some veins occupy cooling cracks in the Nipissing Diabase, with which the ore is spatially and apparently genetically related. The ore minerals consist mainly of native silver and complex arsenides, antimonides, and sulphides; the main elements extracted from them are silver, lead, bismuth, arsenic, antimony, cobalt, copper and nickel.

A type of nickel deposit not yet investigated thoroughly is that associated with so-called "Nipissing Diabase" of the Cobalt-Gowganda area. One reason for the lack of investigation is that most of the nickel in the Cobalt-Gowganda area occurs in arsenides associated with high-grade silver ore. Profitability depends on the extraction of silver from the extremely silver-rich concentrate, and only a small fraction of the nickel contained in the arsenical matte has been paid for by the smelters and consequently recorded as production by the mines. Even so, the recorded production of nickel from the silver mines of the Cobalt area is 8,305 tons, which is in addition to 2,405 tons of copper and 22,483 tons of cobalt (Riddell 1969, p.129).

Nickel Deposits in Proterozoic Gabbroic Complexes

Age: The map showing the distribution of nickel in Canada (Chamberlain and Johnston 1970) points up the fact that the three main nickeliferous areas are along the boundary of the Superior Province of the Precambrian Shield with areas of rocks affected by plutonism 1,500 to 1,700 m.y. ago. The three areas of concentrations of nickel deposits are Thompson in Manitoba, the Cape Smith-Wakeham Bay belt of northern Quebec, and the Sudbury-Cobalt area. Thompson and the Cape Smith-Wakeham Bay belt are in Churchill Province, which is about 1,700 to 1,500 m.y. old (Leach et al. 1963, figure 2). Ages of rocks south of the Sudbury-Cobalt nickeliferous area that were heretofore thought to have been formed during the Grenville orogeny (1,000 to 1,300 m.y. ago) are now known to be about 1,700 to 1,500 m.y. (Krogh and Davis 1969). Included in the 1,700 to 2,000 m.y. age range are Sudbury gabbro, Sudbury norite-granophyre, and

Nipissing diabase-granophyre (Thomson 1969, p.5, and Fairbairn et al. 1968, p.707).

The age of 2,288 ± 87 m.y. (Fairbairn et al. 1968, p.107) for the Gowganda Formation greywacke probably represents a composite age of source rocks for the detritus of which all rocks of the Gowganda Formation are almost exclusively composed. The source rocks constituting the major contributors to the Gowganda Formation are Archean. Archean rocks of the general area have been dated from 2,368 ± 48 m.y. (Rb-Sr whole rock) by Fairbairn et al. (1966, p.142) to 2,605 m.y. (K-Ar biotite) by Lowdon et al. (1963, p.91). The age of a granite boulder in Gowganda conglomerate was determined as being 2,685 ± 50 m.y. (Rb-Sr muscovite) (Van Schmus 1964, p.45). To result in an average age of source rock being 2,288 ± 87 m.y. requires source rocks much younger than the above ages of the major contributor source rocks. This evidence indicates indirectly that the age of some Nipissing Diabase of the Cobalt-Gowganda area is much younger than 2,095 ± 105 m.y. (K-Ar biotite), as determined by Lowdon et al. (1963, p.92).

Some of the "Grenville" rocks, the oldest of which were dated about 1,700 m.y. (Krogh and Davis 1969, p.189), seem to be older than the Cobalt Group of sedimentary rocks (Lumbers 1969, p.62), which are intruded by Nipissing Diabase. These age relationships indicate that some Nipissing Diabase is about 1,700 m.y. or less, which agrees with one of the ages determined for Nipissing granophyre of the Cobalt-Gowganda area (Van Schmus 1964, p.42), 1,630 ± 60 m.y. (Rb-Sr feldspar).

Additional indirect evidence for the age of some Nipissing Diabase being as young as about 1,700 m.y. is provided by Gowganda conglomerate south of Kenogami Bridge on Highway 11 (10 miles west of Kirkland Lake). The Gowganda conglomerate contains boulders of similar appearance to certain phases of the nearby Otto syenitic stock, the age of which, according to Purdy and York (1968) is 1,730 ± 50 m.y. (Rb-Sr whole rock). This Gowganda conglomerate, therefore, might be youngest Aphebian in age, i.e., about 1,735 m.y. according to Stockwell (1968). Symons (1967, p.1168) estimated the Nipissing Diabase to be 10 to 100 m.y. younger than the Cobalt sedimentary rocks.

A reasonable conclusion from all the above evidence is that the age of some "Nipissing Diabase" is close to that of the Sudbury norite-granophyre, which is 1,704 ± 19 m.y. (Rb-Sr whole rock isochron) according to Fairbairn et al. (1968).

Environment: The proximity of large amounts of mantle material to the earth's surface is indicated by the high gravity anomalies of the Sudbury-Cobalt area (Innes 1960, map). The high percentage of Proterozoic gabbro-granophyre complexes can be accounted for by the long deep rift faults of the Lake Timiskaming Rift zone having acted as channelways for tapping magmas from the earth's mantle (Lovell and Caine 1970, p.8). The Sudbury irruptive itself is at the junction of the Lake Timiskaming Rift zone as described by Lovell and Caine (1970, p.13) and the branch of the St. Lawrence Rift system extending westward through Lake Nipissing and the area south of Sudbury (Kumarapeli and Saull 1966, map opposite page 650; Doig 1969, p.24,27) (see Figure 4).

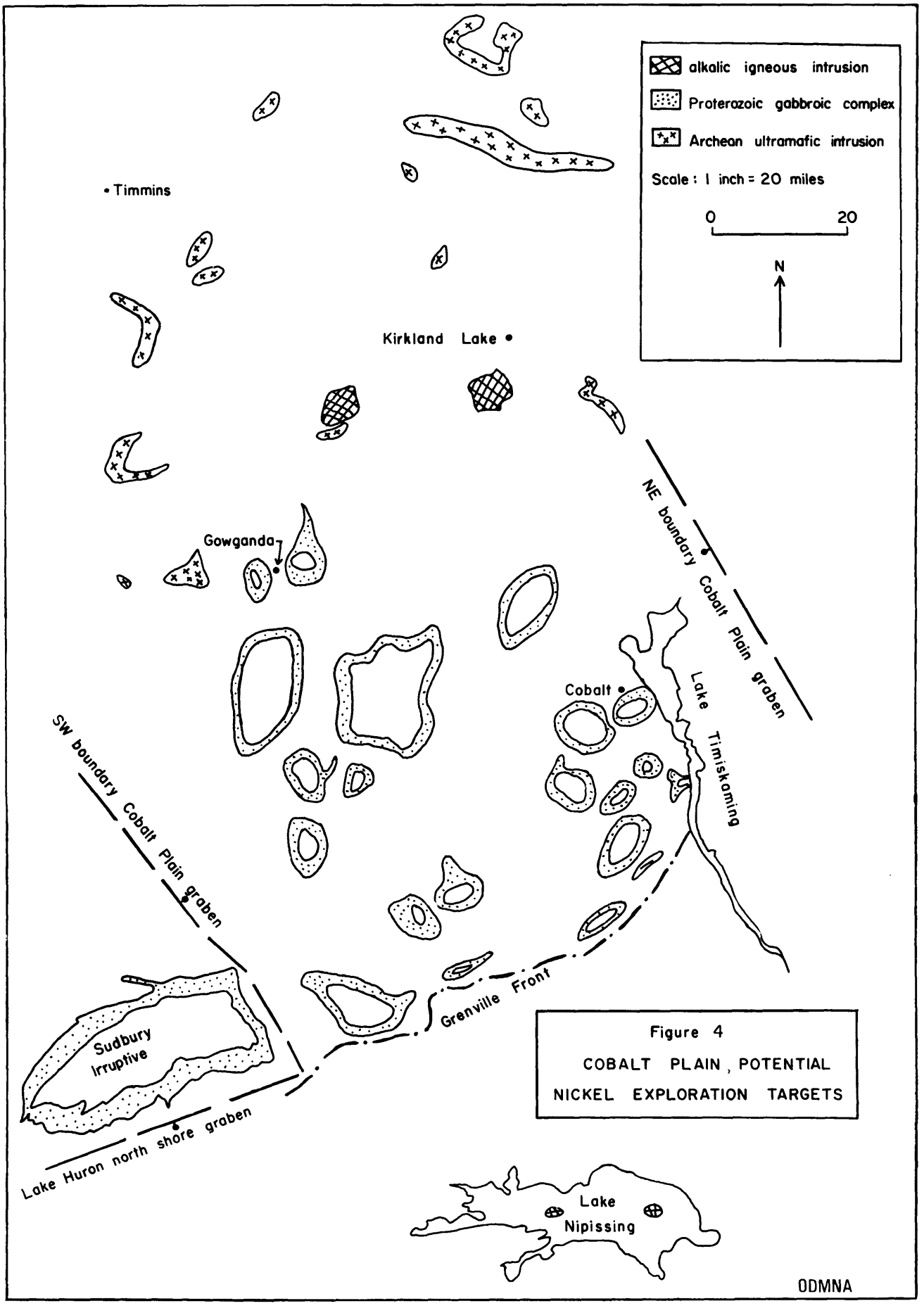


Figure 4

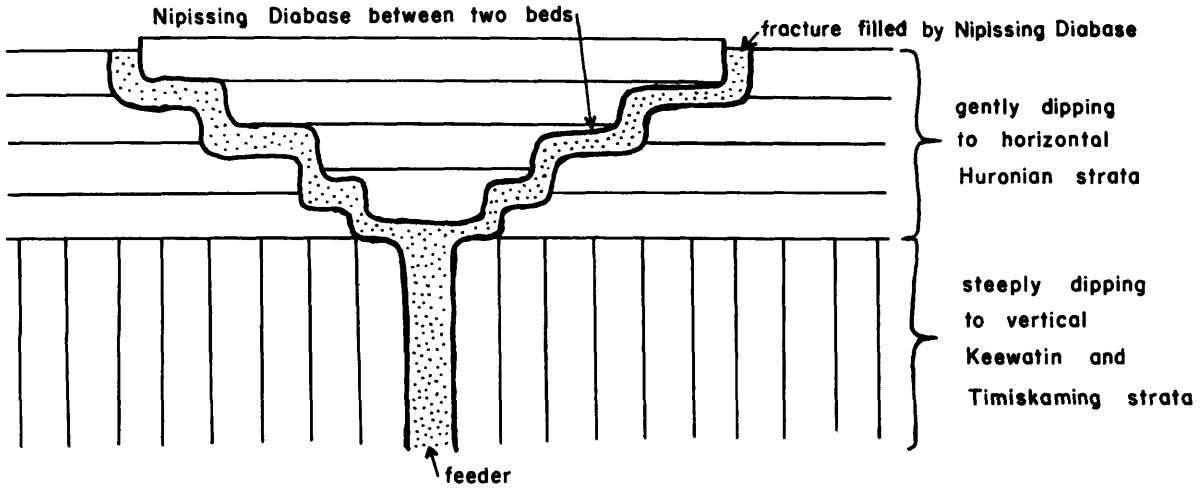
COBALT PLAIN, POTENTIAL NICKEL EXPLORATION TARGETS

Form: Although the Nipissing Diabase frequently has been described as a single "undulating sill" that once extended from the Sudbury area to Cobalt, evidence suggests it is made up of many separate cone-shaped intrusions, which now are called diabase "basins". MacKean (1968, p.13) considers the Nipissing Diabase of the Elk Lake area to be not just a sill, but a complex intrusion that was intruded along feeder dikes. Hester (1967) considers the Nipissing Diabase at the Gowganda silver mines to be a modified cone sheet rather than a warped sill. A diagrammatic vertical section of a typical "basin" of Nipissing Diabase is illustrated by Lovell and Caine (1970, p.12) as being a step-sided cone-shaped intrusion. In plan view, the cone-shaped intrusions generally form circular to oval patterns of distribution. However along the "Grenville Front" from Sudbury to southeast of Cobalt, ellipses predominate (Lumbers 1966; Thomson and Savage 1965; Meyn 1966). The ellipses might be the result of distortion of the original shapes by compressional forces such as those that obtained during reverse faulting near the Grenville Front (Thomson 1969, p.5,14; Card 1969, p.8), possibly in a manner similar to that described by Kirwan (1966, p.57,59) for the Sudbury irruptive (see Figure 5).

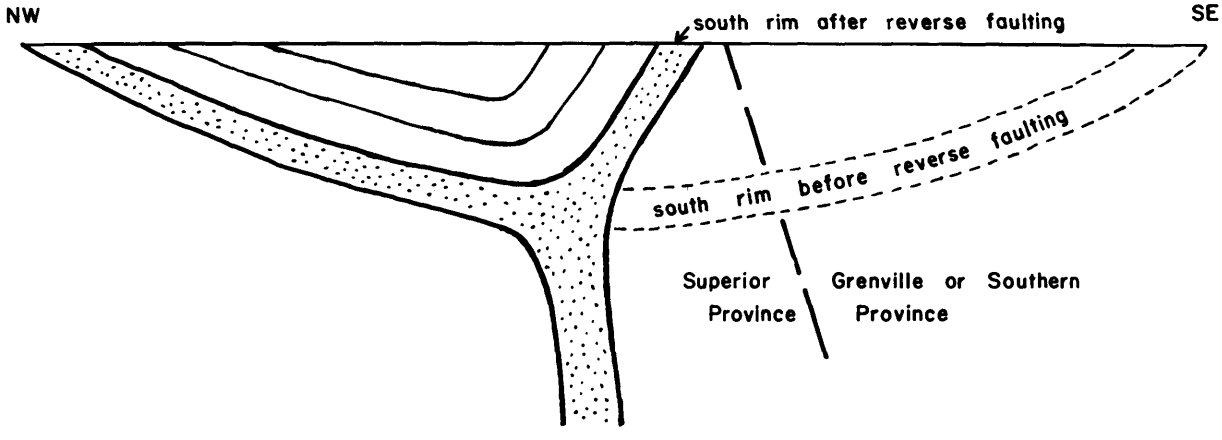
Petrography: The "Nipissing" type of diabase has been the subject of several petrographic and chemical studies, because of its close association with high-grade silver deposits. According to Hriskevich (1952) the Nipissing Diabase typically is made up of undifferentiated quartz-plagioclase-augite "diabase", varied texture diabase, transition zone, hypersthene gabbro and granophyre.

In places, e.g. Kerns Township, large areas of bedrock consist of granophyre. Granophyre (micropegmatite) is a late differentiate of the same magma and is found in the upper portion of the diabase, as well as in country rocks. It contains pink feldspar (plagioclase and microcline), quartz, amphibole, pyroxene and miarolites. The hypersthene gabbro, which contains olivine, augite, and plagioclase as well as hypersthene, actually is norite (Card et al. 1970, p.101). In the quartz diabase, the plagioclase ranges from $Ab_{33}An_{67}$ in the core to $Ab_{54}An_{46}$ in the rim; i.e., the quartz "diabase" actually is quartz diorite to quartz gabbro, some of which has diabasic texture. Some quartz diorites of the Sudbury area resemble Sudbury-type breccia (Cooke 1948, p.589), which is associated with Nipissing Diabase (Thomson 1960, p.15). The similarity of the Nipissing Diabase to the probable quartz diorite parent magma of the Sudbury irruptive has been noted by Sergiades (1968, p.5).

Mineralization: The economic mineralization in the silver mines of the Cobalt-Gowganda area consists mainly of carbonate veins bearing minerals containing nickel, copper, cobalt, and silver. The mineralization is epithermal (deposited at high levels of intrusions, at shallow depths in the earth's crust), and the carbonate veins are in or near Nipissing Diabase. Most of those who have studied the silver mineralization consider it to be genetically related to the Nipissing Diabase: the silver-cobalt veins and the Nipissing Diabase had a common parentage (Thomson 1957, p.382); the Nipissing Diabase is a potential source of the elements found in the veins (Jambor 1971). According to Jambor (1971, p.42), nickel in Nipissing Diabase of the Cobalt-Gowganda area is fairly constantly around 50 to 60 ppm, in the early-formed silicates and oxides as a result of extraction from the magma, but in "sulphide" form with progressive fractionation to the granophyric differentiate.



circular cone-shaped intrusion of Nipissing Diabase,
Cobalt-Gowganda area (after Lovell and Caine, 1970, p. 12)



circular Proterozoic gabbroic complex now distorted
into an ellipse, with dip of its southern rim steepened
by reverse faulting along the Grenville Front

Figure 5
IDEALIZED VERTICAL SECTIONS OF CIRCULAR
AND ELLIPTICAL CONE-SHAPED INTRUSIONS

ODMNA

In contrast, the mineralization at Sudbury consists of massive sulphides and quartz gangue containing nickel, copper, cobalt, and silver, and has been classified as epigenetic replacement bodies, in part of high temperature hydrothermal and in part of the deep-seated contact metamorphic type (Yates 1948, p.602).

Whereas Cobalt is in the Lake Timiskaming Rift Valley, which is a highly block faulted part of the proposed regional graben occupied by the Cobalt Plain (Lovell and Caine 1970, p.13), Sudbury is on what would be the relatively upthrown side (see Figure 4). Thus the deep levels of intrusions from the earth's mantle should be farther below surface in the Cobalt area than at Sudbury, and an unexplored possibility exists that at deeper levels the Nipissing Diabase might contain massive nickel sulphide mineralization. To test this possibility, deeper levels of the Nipissing Diabase intrusions must be located. This can be done by determining which of the northwest-trending blocks of the Cobalt Plain graben dropped down the least. That is to say, determine which blocks have levels of intrusion of Nipissing Diabase at or near surface that are comparable, in distance from the earth's mantle, with the ore-bearing levels in the Sudbury mines.

Also, in the Cobalt-Gowganda area, some gravity anomalies are of similar magnitude to those at Sudbury (Innes 1960). In fact the gravity anomaly formed by the Sudbury irruptive itself is merely the west-jutting appendage of a broad gravity anomaly apparently caused mainly by Nipissing Diabase. Some of these gravity highs seem to be caused by Nipissing Diabase feeders (Lovell 1970, p.81; Gibb et al. 1969, Map No. 58). Deep drilling of such feeders, especially in the parts of blocks of the Lake Timiskaming Rift system that dropped down the least, would test the deeper levels of Nipissing Diabase for their potential for nickel sulphides, such as those in the Cobalt area that were discovered recently by Petruk et al. (1969).

References

Card, K.D.
1969: Geology and geochronology of the Southern Province of the Canadian Shield; unpubl. paper, Geol. Soc. Amer. northeast section symposium.
1970: Operation Maple Mountain; Ontario Dept. Mines and Northern Affairs, Open File Rept. 5050, 275p. and 4 maps.

Chamberlain, J.A., and Johnston, A.G.
1970: Nickel in Canada; Geol. Surv. Canada, Map 1258A.

Cooke, H.C.
1948: Regional structure of the Lake Huron-Sudbury area, in Structural geology of Canadian ore deposits, Jubilee Vol., CIMM, p.580-589.

Doig, Ronald
1969: An alkaline rock province linking Europe and North America; Can. J. Earth Sci., Vol. 7, No. 1, p.22-28.

Fahrig, W.H., and Wanless, R.K.
1963: Age and significance of diabase dyke swarms of the Canadian Shield; Nature Vol. 200, No. 4910, p.934-937.

Fahrig, W.H., Gaucher, E.M., and Larochelle, A.
1965: Paleomagnetism of diabase dykes of the Canadian Shield; Can. J. Earth Sci., Vol. 2, No. 4, p.278-298.

Fairbairn, H.W., Pinson, W.H. Jr., and Hurley, P.M.
1966: Age relations of volcanics at Kirkland Lake, Ontario, with the Round Lake pluton; Mass. Inst. Tech. 14th Ann. Progress Rept., p.141-143.

Fairbairn, H.W., Faure, G., Pinson, W.H. Jr., and Hurley, P.M.
1968: Rb-Sr whole-rock age of the Sudbury lopolith and basin sediments; Can. J. Earth Sci., Vol. 5, No. 3, pt.2, p.707-714.

Fairbairn, H.W., Hurley, P.M., Knight, C.J., and Pinson, W.H. Jr.
1968: Evidence from Gowganda, Ontario, for the age of the Nipissing diabase and associated Huronian; Mass. Inst. Tech. 16th Ann. Progress Rept., p.107-114.

Gibb, R.A., van Boeckel, J.J.G.M., and Hornal, R.W.
1969: A preliminary analysis of the gravity anomaly field in the Timmins-Senneterre mining area; Dom. Observatory No. 58, 25p. and 2 maps.

Goodwin, A.M.
1965: Mineralized volcanic complexes in the Porcupine-Kirkland Lake-Noranda region, Canada; Econ. Geol., Vol. 60, p.955-971.
1966: Archean protocontinental growth and mineralization; Can. Min. J., May 1966, p.57-60.
1968: Evolution of the Canadian Shield; Geol. Assoc. Canada, Vol. 19, p.1-14.

Hester, B.W.
1967: Geology of the silver deposits near Miller Lake, Gowganda; Trans. CIMM, Vol. 70, p.277-286.

Hriskevich, M.E.
1952: Petrology of the Nipissing Diabase sheet of the Cobalt area of Ontario; Ph.D. thesis, Princeton University, New Jersey.

Innes, M.J.S.
1960: Gravity and isostasy in northern Ontario and Manitoba; Dom. Observatory, Vol. 21, No. 6 and accompanying map, scale 1 inch to 20 miles.

Jambor, J.L.
1971: Distribution of some minor elements in the Nipissing Diabase of the Cobalt-Gowganda region; paper in preparation. Draft copy on file, Resident Geologist's office, Kirkland Lake, 49p.

Kirwan, J.L.
1966: The Sudbury irruptive and its history; Can. Min. J., Aug.1966, p.54-58.

Krogh, T.E., and Davis, G.L.
1969: Old isotopic ages in the northwestern Grenville Province, Ontario; Geol. Assoc. Canada, special paper No. 5, p.189-192.

Kumarapell, P.S., and Saull, V.A.
1966: The St. Lawrence rift system: a North American equivalent of the east African rift valley system; Can. J. Earth Sci., Vol. 3, No. 5, p.639-658.

Leech, G.B., Lowdon, J.A., Stockwell, C.H., and Wanless, R.K.
1963: Age determinations and geological studies, report 4; Geol. Surv. Canada, 140p. and 5 figures.

Lindsey, D.A.
1969: Glacial sedimentology of the Precambrian Gowganda Formation, Ontario, Canada; Geol. Soc. Amer. Bull., Vol. 80, p.1685-1702.

Lovell, H.L.
1970: Kirkland Lake district; Ontario Dept. Mines, MP35, p.1-15.
1970: Kerns, Harley, Hudson, and Dymond Townships, District of Timiskaming, in Ontario Dept. Mines and Northern Affairs, MP43, p.80-81.

Lovell, H.L., and Caine, T.W.
1970: Lake Timiskaming Rift Valley; Ontario Dept. Mines, MP39, 16p.

Lowdon, J.A.
1961: Age determinations of the Geological Survey of Canada; Geol. Surv. Canada Paper 61-17, 127p. and 2 maps.

Lowdon, J.A., Stockwell, C.H., Tipper, H.W., and Wanless, R.K.
1963: Age determinations and geological studies, report 3; Geol. Surv. Canada; Paper 62-17, 140p. and 3 illustrations.

Lumbers, S.B.
1966: Tomiko Sheet, District of Nipissing; Ontario Dept. Mines, Prelim. Geol. Map P.394, Geol. Comp. Series, scale 1 inch to 2 miles. Geological compilation 1966.
1969: Tomiko area; Ontario Dept. Mines, MP32, p.61-64.

Meyn, H.D.
1966: Capreol Sheet, Districts of Sudbury and Nipissing; Ontario Dept. Mines, Prelim. Geol. Map P.367, Geol. Comp. Series, scale 1 inch to 2 miles. Geological compilation 1966.

MacKean, B.E.
1968: Geology of the Elk Lake area, District of Sudbury; Ontario Dept. Mines, GR62. Accompanied by Maps 2150, 2151, 2152, scale 1 inch to 1/2 mile.

Petruk, W., Harris, D.C., and Stewart, J.M.
1969: The new mineral Langisite, and the rare minerals cobalt pentlandite, perkerite, siegenite, and bravoite from the Langis Mine, Cobalt-Gowganda area, Ontario; Can. Min., in press.

Purdy, J.W., and York, D.
1968: Rb-Sr mineral ages of rocks from the Superior Province near Kirkland Lake, northeastern Ontario, Canada; Can. J. Earth Sci., Vol. 5, No. 3, pt.2, p.699-705.

Pyke, D.R., and Middleton, R.S.
1970: Distribution and characteristics of the sulphide ores of the Timmins area; Ontario Dept. Mines, MP41, 24p. Accompanied by map, scale 1 inch to 2 miles.

Riddell, G.S.
1969: Statistics of the mineral industry and mining operations in Ontario for 1967; Ontario Dept. Mines, Ann. Rept., Vol. 77, 192p.

Ridler, R.H.
1969: The relationship of mineralization to volcanic stratigraphy in the Kirkland Lake area, Ontario; unpubl. Ph.D. thesis, U. of Wisconsin, Madison, Wisconsin, 141p.
1970: Relationship of mineralization to volcanic stratigraphy in Kirkland-Larder Lakes area, Ontario; Geol. Assoc. Canada, Vol. 21, p.33-42.

Sergiades, A.O.
1968: Silver cobalt calcite vein deposits of Ontario; Ontario Dept. Mines, MRC10, 498p.

Stockwell, C.H.
1968: Geochronology of stratified rocks of the Canadian Shield; Can. J. Earth Sci., Vol. 5, No. 3, pt.2, p.693-697.

Symons, D.T.A.
1967: Paleomagnetism of Precambrian rocks near Cobalt, Ontario; Can. J. Earth Sci., Vol. 4, No. 6, p.1161-1169.

Thomson, J.E.T.
1948: Geology of Teck Township and the Kenogami Lake area, Kirkland Lake gold belt; Ontario Dept. Mines, Vol. 57, pt.5, p.1-53.
1960: MacLennan and Scadding Townships; Ontario Dept. Mines, GR2, 34p. and 1 map.
1969: A discussion of Sudbury geology and sulphide deposits; Ontario Dept. Mines, MP30, 32p.

Thomson, R.T.
1957: Cobalt camp, in Structural geology of Canadian ore deposits; Vol. 11, CIMM, p.377-388.

Thomson, R.T., and Savage, W.S.
1965: Haileybury Sheet, Districts of Timiskaming and Nipissing; Ontario Dept. Mines, Prelim. Geol. Map P.321, Geol. Comp. Series, scale 1 inch to 2 miles. Geological compilation 1965.

Tully, D.W.
1963: The geology of the Upper Canada Mine; Geol. Assoc. Canada, Vol. 15, p.61-86.

Van Schmus, W.R.
1964: The geochronology of the Blind River-Bruce Mines area, Ontario, Canada; paper in preparation. Draft copy on file, Resident Geologist's office, Kirkland Lake.

Yates, A.B.
1948: Properties of International Nickel Company of Canada, in Structural geology of Canadian ore deposits, Jubilee Vol., CIMM, p.596-617.

RED LAKE DISTRICT

By

R.A. Riley

CONTENTS

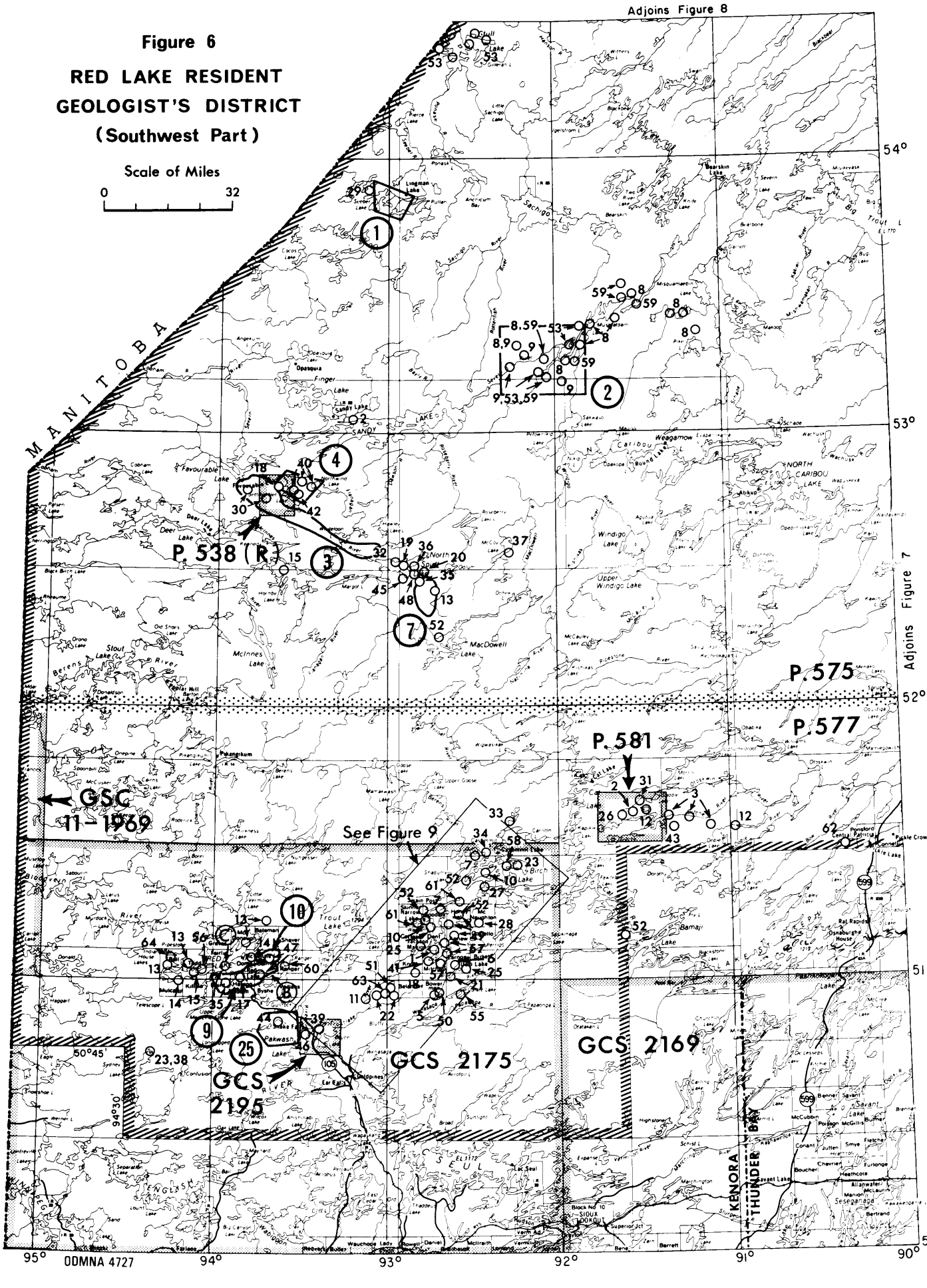
Red Lake District

Tables

Figures

Figure 6

RED LAKE RESIDENT GEOLOGIST'S DISTRICT (Southwest Part)



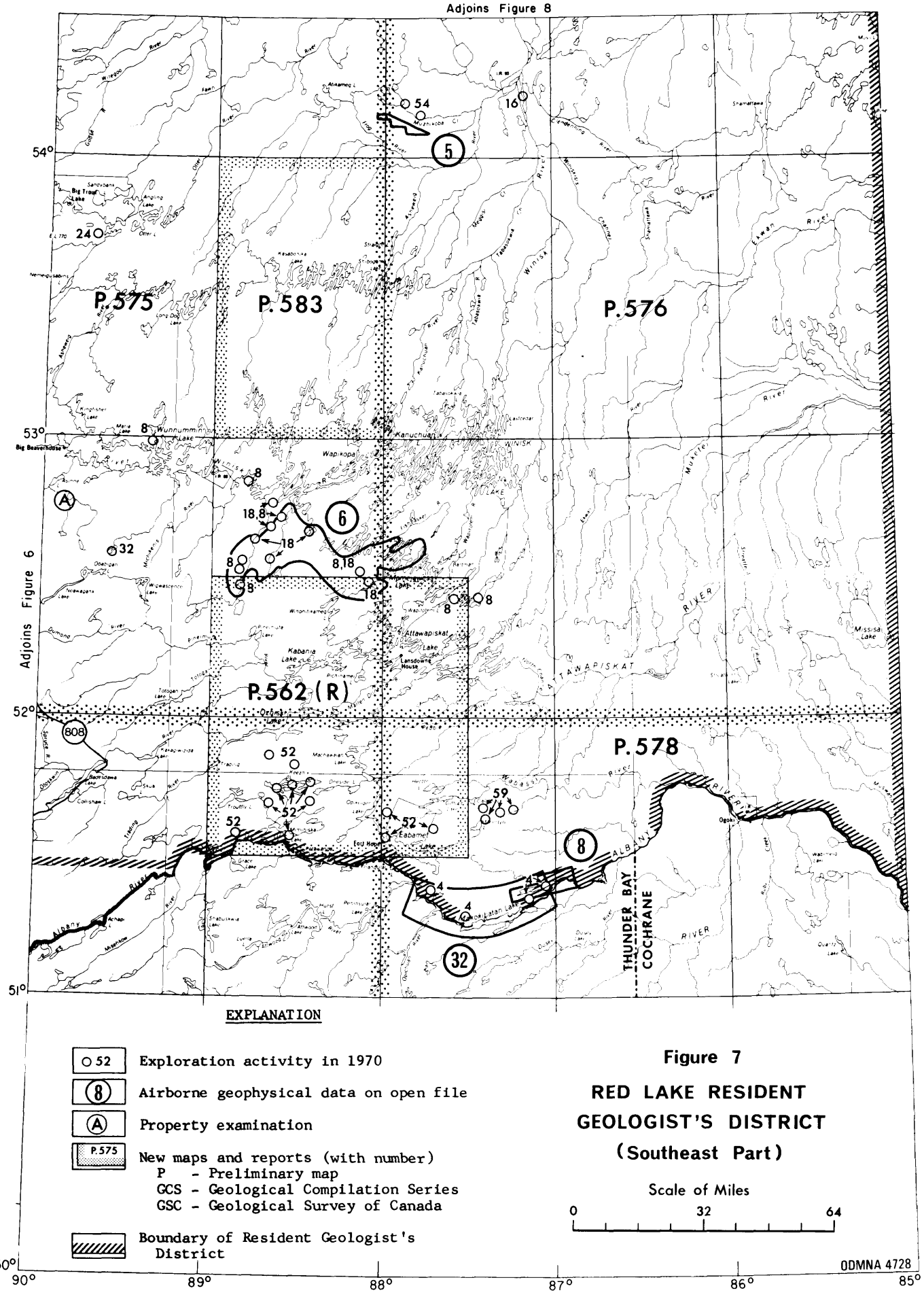


Figure 7

RED LAKE RESIDENT GEOLOGIST'S DISTRICT (Southeast Part)

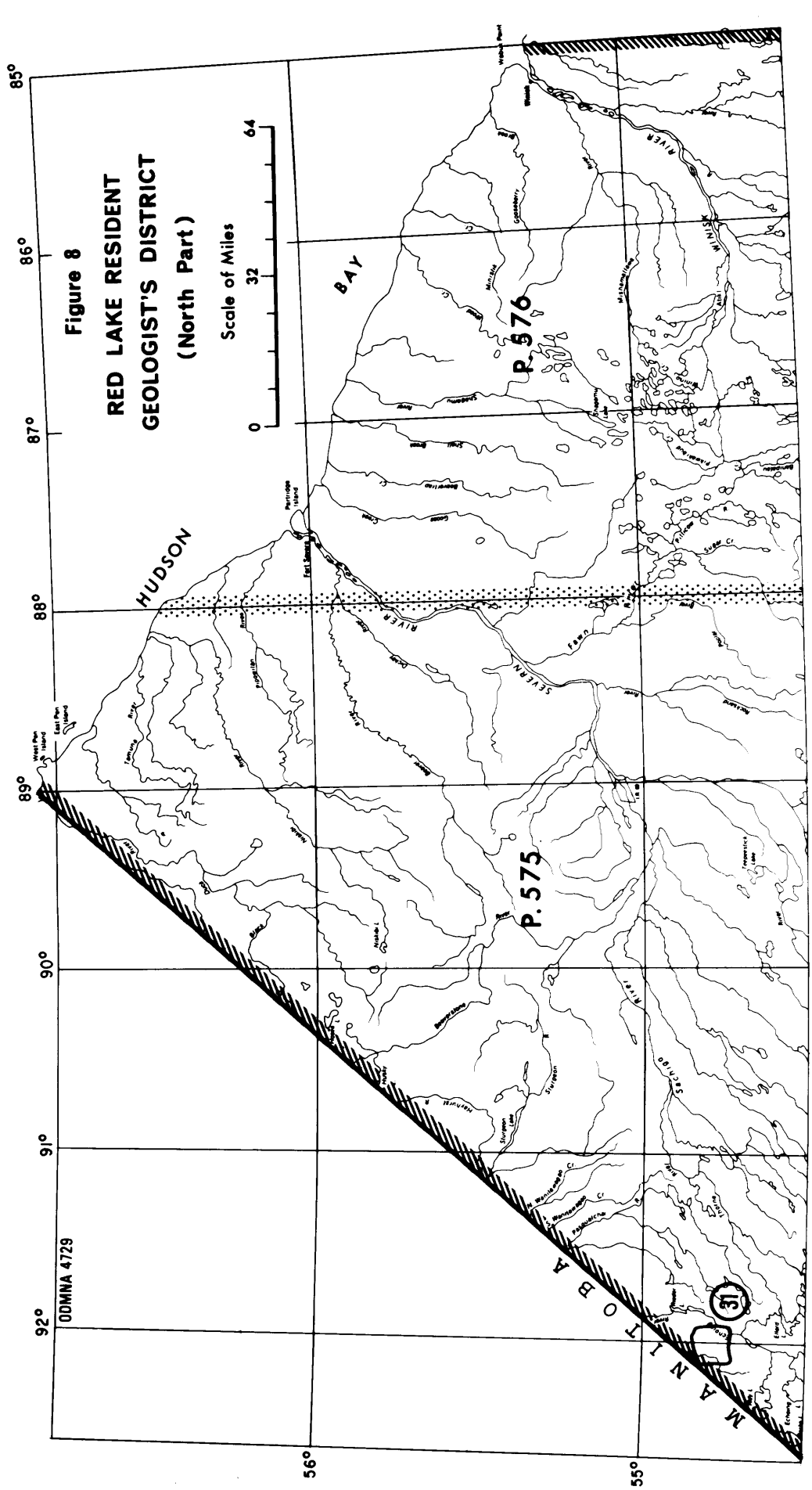


Figure 8
RED LAKE RESIDENT
GEOLOGIST'S DISTRICT
(North Part)
Scale of Miles
0
32
64
HUDSON
BAY
P. 576
P. 575
MANITOBA
ONTARIO
ODMNA 4729
Adjoins Figures 6,7

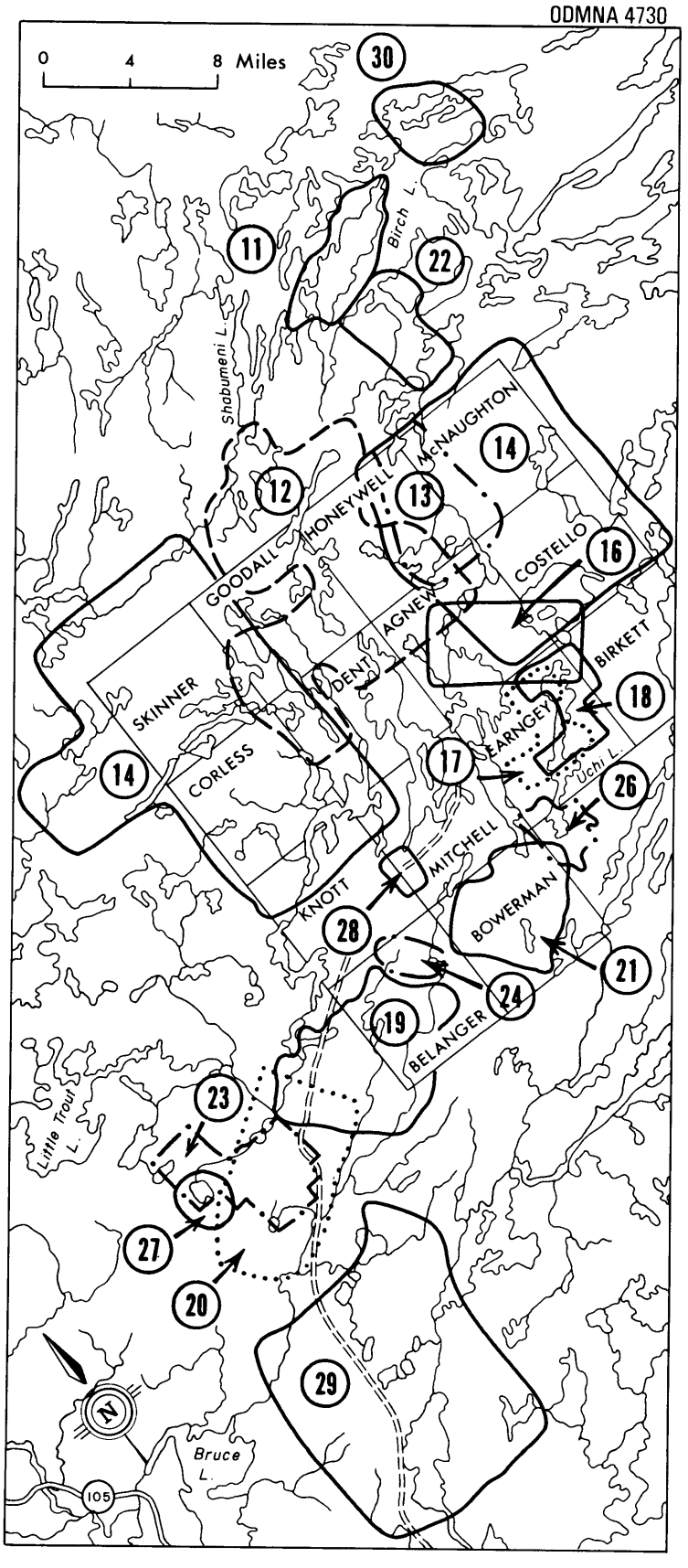


Figure 9 – Birch – Uchi Lakes Area

RED LAKE DISTRICT

By

R.A. Riley[1]

RESIDENT GEOLOGIST'S ACTIVITIES

The activities of the Red Lake Resident Geologist during 1970 were varied as usual. During the field season much of the Resident Geologist's time was consumed in a detailed mapping program in Ball Township at the west end of the Red Lake metavolcanic-metasedimentary belt. In the course of this program the southwestern corner of Mulcahy Township and the western part of Todd Township were also mapped in a reconnaissance fashion. A cursory examination of the Big Beaverhouse carbonatite was carried out in early July and an unsuccessful attempt to locate outcrop of the Schryburt Lake carbonatite was made at the same time. Two showings in the Red Lake area were investigated and are described elsewhere in this report. Visits were paid to the property of Minorex Ltd. at Setting Net Lake, the Rexdale property of Copper-Lode Mines Ltd. at Snakeweed Lake, and the South Bay Mines Ltd. property at Confederation Lake.

Consultation with geologists, exploration personnel, and prospectors on various aspects of northwestern Ontario geology and mineral exploration proved to be the most actively solicited service provided by the writer. This service and routine matters absorbed most of the time allocated to office duties. In addition, a report on the geology of Mulcahy Township was begun as was a preliminary geological map of Ball Township.

Several field sorties were made with students of the Red Lake District High School at which time the students were introduced to many of the geological highlights of the Red Lake area. The writer also provided some assistance to Mr. E.B. Freeman of the Data Retrieval and Education Section during a series of Mineral Exploration Classes held in Red Lake in March.

Several scientific meetings were attended by the writer during the year including the Third International Symposium on Geochemical Exploration and the annual meeting of the Canadian Institute of Mining and Metallurgy in Toronto in April, the 16th Annual Institute on Lake Superior Geology and the associated field trip in Thunder Bay in May, and the Geological Association of Canada annual meeting and associated field trip in Winnipeg in late August. In September the writer hosted a three day field excursion in the Red Lake area for staff geologists of the Geological Branch.

Other Geological Branch Activity

The Geological Surveys Section and Data Retrieval and Education Section were both active in the Red Lake Resident Geologist's district during the year. The Geological Surveys Section had four field parties in the area during the

---

[1]Resident Geologist, Ontario Government Building, Red Lake, Ontario.
Manuscript accepted for publication February 11, 1971.

field season. L.D. Ayres supervised a detailed mapping project in the Setting Net Lake area and completed reconnaissance mapping of the Favourable Lake-Poplar Hill area, K.G. Fenwick continued detailed mapping in the Lang-Cannon Lakes area, and A.P. Pryslak completed detailed mapping of Knott and Corless Townships in the Woman Lake area. References to brief reports on these projects can be found in the 1970 Publications Section of this report.

The Data Retrieval and Education Section carried out two projects in the area during 1970. During February and early March, Mr. Charles Haultain held a series of mineral exploration classes in central Patricia and also in some of the isolated settlements in the northeastern part of the district including Big Trout Lake, Kingfisher Lake, Wunnummin Lake, and Kasabonika Lake. In mid-March, Mr. E.B. Freeman conducted a successful series of mineral exploration classes in Red Lake.

MINING ACTIVITY

During 1970, five district mines maintained continuous operations and by year-end development was well underway on one other property. The principal developments at these mines are outlined below.

Campbell Red Lake Mines Limited

Production at Campbell Red Lake Mines Ltd. during 1970 showed a slight increase above 1969 figures with approximately 179,000 ounces recovered from 262,021 tons milled. All production was obtained from above the 15th level and development below this level was maintained at a normal pace. During the year deepening of the shaft commenced and by year-end the shaft had been deepened to about the 3,850-foot level for an advance of about 570 feet.

Cochenour Willans Gold Mines Limited

(Including Annco Mines Ltd. and Wilmar Mines Ltd.)

Production figures for Cochenour Willans Gold Mines Ltd. and the adjoining properties of Annco Mines Ltd. and Wilmar Mines Ltd., both controlled by Cochenour and mined through the Cochenour shaft, are given below:

	Tons milled	Au/oz.	Ag/oz.
Cochenour	18,575	3,080	154
Annco	8,441	3,309	165
Wilmar	67,264	18,475	24,866
Total	94,280	24,864	25,185

Production from the three properties was maintained at about the same level as last year. From the point of view of significant developments, two new stopes were developed on Cochenour's 20th level, and the 1,700-foot level in Wilmar was opened up and a new ore block made ready for production.

Dickenson Mines Limited

(Including Robin Red Lake Mines Ltd.)

Dickenson Mines Ltd. production during 1970 totalled 65,884.4 ounces (estimated; final mint returns not available) from 160,090 tons milled. Proven ore reserves in the No. 1 shaft area were maintained through the development of stope extensions and sublevels. In the No. 2 shaft area development centred on the 30th level which was pushed out along a weak ore structure to within about 400 feet of the Robin boundary. Underground exploration was seriously hampered for most of the year by a shortage of diamond drillers.

In the latter part of 1970 control of Robin Red Lake Mines Ltd. was acquired by Dickenson and that company announced that the Robin orebody would be mined by Robin Red Lake Mines Ltd. at a rate of about 100 tons per day. Milling is to be carried out by Dickenson and this company will curtail its production slightly to accommodate the Robin ore in the mill. Production from the Robin property during November and December totalled 3,949 tons from which a production grade of 1.084 ounces per ton was obtained. Development at Robin during the year consisted of the completion of the 20th level main haulage from the Dickenson shaft to the Robin orebody and some exploration raising.

The Griffith Mine

Production at the Stelco-owned Griffith Mine was nearly at capacity in 1970 with approximately 1,471,000 long tons of pellets being produced from approximately 4,545,000 long tons of crude ore. The average grade of the pellets was 64.01 percent Fe, 2.60 percent moisture, 4.89 percent SiO_2, 0.56 percent Al, 0.07 percent Mn, and 0.02 percent P. In total, some 5,726,000 long tons of material were moved in the year's operation. The North Perimeter Dike was extended 6,000 feet during the year for a total length of 9,500 feet. The installation of pellet coolers in the mill early in the new year has greatly facilitated loading operations by cutting about one hour off the time necessary to load a train.

Madsen Red Lake Gold Mines Limited

During 1970 production at Madsen Red Lake Gold Mines Ltd. totalled 184,530 tons from which an estimated 40,572 ounces of gold were recovered. Also during the year the milling rate was reduced from 800 to 425 tons per day. Although the south section of the mine supplied most of the mill feed, production from the northerly No. 8 zone commenced in 1970 and by year-end this area was supplying about 1,000 tons of ore per month to the mill. Exploration diamond drilling continued in the south section of the mine but most development work was concentrated in the No. 8 zone. The raise from the producing 24th level was completed to the 23rd level and a crosscut was driven through the No. 8 zone on the 23rd level, two short extension drifts completed, and some exploration diamond drilling carried out. A crosscut to the No. 8 zone was also begun on the 25th level.

South Bay Mines Limited

Development of the 1968 Dent Township Zn-Cu-Ag discovery of Selco Exploration Company Ltd. by South Bay Mines Ltd. commenced during the early part of 1970, and was well underway by year-end with production tentatively scheduled for March, 1971. To permit both development and production to proceed simultaneously the ore zones are being developed by both a shaft and a decline. The shaft bottom was at the 420-foot level at year-end and sinking was to resume early in the new year after a temporary curtailment during intensified development of the upper levels. The decline has been driven to the 150-foot level and from it development of the ore zones is being pursued on both the 50-foot sublevel and the 150-foot level. Development ore from these areas is being stockpiled awaiting completion of the mill, tentatively scheduled for March, 1971.

EXPLORATION ACTIVITY

The pace of exploration activity during 1970 was not only quickened somewhat from that of 1969 but it was also much more widespread. Several major exploration programs were instigated during the year including those at Stull Lake, Muskrat Dam Lake, Wunnummin-Mameigwess Lakes, Makokibatan-Washi Lakes, Fort Hope, McIntyre Lake, and those in the Winisk River area. Major exploration programs begun previous to 1970 were continued in the Favourable-Setting Net Lakes area, the North Spirit Lake area, at McCoy Lake, in the Keezhik-Miminiska Lakes area, the Lang-Cannon Lakes area, the Birch-Uchi Lakes area, the Dixie Lake area, the Red Lake area, and the Pickle Lake area. During late November and December a small staking rush was underway in the Pickle Lake area where Union Miniere Exploration and Mining Corporation Ltd. reported intersecting several long sections of low-grade copper-nickel mineralization.

Probably the most adventurous exploration programs to be instigated in Ontario for many years began in late summer with the nearly simultaneous application for exploratory licences by Kennco Exploration Ltd., Canex Aerial Exploration Ltd., and Cominco Ltd. in the Winisk River area of the Hudson Bay Lowlands in northwestern Ontario. By year-end 28 licences, each covering between 23,864 and 64,000 acres and totalling in excess of 1.35 million acres had been granted to exploration companies and a few individuals.

These exploration licences cover, for the most part, a major northwest-trending magnetic feature and some of its easterly-trending off-shoots which lie under an estimated 100 to 400 feet of Paleozoic, Pleistocene, and Recent sediments. At the junction of the Ashweig River and the Winisk River the structure tends to broaden or possibly even split and several magnetic highs in this area are suggestive of mafic intrusive rocks. At this locality the structure lies between 15 and 20 miles northeast of the Precambrian-Paleozoic contact.

The northwest-trending magnetic feature has been interpreted as a fault by Ayres et al. (1969). Broad magnetic features apparently offset along this fault have, on the basis of their magnetic patterns, been interpreted by Bell (1970) to be part of what he calls the Pikwitonei Province of the Canadian

Table 8 Exploration Activity in 1970

The following is a list of companies and individuals engaged in exploration within the District in 1970 and the type of work known to be undertaken in each case. The numbers correspond to the various numbered areas on Figures 6 and 7.

	Individual or Company	Activities
1.	Alexander Red Lake Mines Ltd.	Diamond drilling in south central Dent. Tp.
2.	Algoma Steel Corporation Ltd., The	Diamond drilling north of Lang Lake, and south of Kakapitam Lake in the Sandy Lake area.
3.	Amax Exploration, Inc.	Ground electromagnetic and magnetometer surveys in the vicinity of McVicar Lake and the Gitchie River.
4.	Amoco Canadian Petroleum Co. Ltd.	Airborne and ground electromagnetic and magnetometer surveys in the vicinity of Washi and Makokibatan lakes.
5.	Armore Mines Ltd.	Ground electromagnetic survey in Bowerman Tp.
6.	Bohme, J. D. S.	Diamond drilling in Earngey Tp.
7.	Bralorne Can-Fer Resources Ltd.	Magnetometer survey in northeast Goodall Tp. and geological investigations in the Mink Lake area.
8.	Canadian Nickel Co. Ltd.	Ground geophysical surveys and diamond drilling in the Muskrat Dam Lake-Munekun Lake area; airborne and ground geophysical surveys and diamond drilling in the Wunnummin Lake area.
9.	Canadian Onex Mines Ltd.	Ground geophysical surveys and diamond drilling in the Muskrat Dam Lake area.
10.	Canex Aerial Exploration Ltd.	Ground electromagnetic surveys and diamond drilling in the Birch Lake area; ground electromagnetic and magnetometer surveys and diamond drilling in the vicinity of Woman Lake in Dent and Goodall Tp.
11.	Caravelle Mines Ltd.	Ground geophysical surveys and diamond drilling in the Trout Lake River area.
12.	Card Lake Copper Mines Ltd.	Ground electromagnetic and magnetometer surveys and diamond drilling in the Boyes Lake area; electromagnetic survey and diamond drilling at the west end of Wettlaufer Lake.
13.	Cochenour Explorations Ltd.	Ground electromagnetic and magnetometer surveys in central Ball Tp. and in the Hewitt Lake area; airborne electromagnetic and magnetometer surveys in western Todd Tp., diamond drilling in central McDonough Tp. and the Black Bear Lake area.
14.	Cochenour Willans Gold Mines Ltd.	Ground geophysical investigations, general prospecting, geological mapping, and diamond drilling in northeast Mulcahy Tp., surface diamond drilling in Dome Tp.
15.	Coin Lake Gold Mines Ltd.	Ground electromagnetic and magnetic surveys and diamond drilling in the Wolf Bay area of Todd Tp., general prospecting, trenching and geological mapping east of Warwick Lake.
16.	Cominco Ltd.	Geophysical surveys and diamond drilling in the Winisk River area.
17.	Consolidated Buffalo Red Lake Mines Ltd.	Geological investigations in north central Heyson Tp.
18.	Conwest Exploration Co. Ltd.	Airborne and ground electromagnetic and magnetometer surveys and diamond drilling in the Wunnummin Lake-Mameigwess Lake area; surface exploration and diamond drilling on the Setting Net Lake property of Severn Mines Ltd., ground electromagnetic and magnetometer surveys in Knott and Belanger Tp.
19.	Desmeules, G.	Trenching in the North Spirit Lake area.
20.	Dickenson Mines Ltd.	Diamond drilling in the North Spirit Lake area.

	Individual or Company	Activities
21.	Dome Exploration (Canada) Ltd.	Diamond drilling at the south end of Uchi Lake.
22.	Erzgesellschaft, m.b.h.	Ground electromagnetic, magnetometer, and induced polarization surveys, geological surveys, general prospecting, and diamond drilling in the Troutlake River and Gerry Lake area.
23.	Falconbridge Nickel Mines Ltd.	Ground afmag and magnetometer surveys and diamond drilling in the Birch Lake area; afmag and magnetometer surveys in the Sydney Lake area.
24.	Farrington, J.	Diamond drilling in the central part of Big Trout Lake.
25.	Hanna Gold Mines Ltd.	Ground electromagnetic and magnetometer surveys in Corless, Dent, and Earngey Tp.
26.	Hanna Mining Co., The	Diamond drilling in the Lang Lake area.
27.	Hudson Bay Oil and Gas Co. Ltd.	Ground geophysical and reconnaissance geological surveys and diamond drilling in the Exit Bay area of Birch Lake.
28.	Huston, C. C.	Ground electromagnetic and magnetometer surveys in McNaughton Tp.
29.	Johnson, E.	Geophysical and geological investigations in the Seeber Lake area.
30.	Keevil Mining Group Ltd.	Ground geophysical and geological investigations and diamond drilling in the Favourable Lake-Bearhead Lake area.
31.	Kennco Explorations (Canada) Ltd.	Diamond drilling in the Saddle Lake area.
32.	Kerr Addison Mines Ltd.	Magnetometer and geochemical surveys in the Schryburt Lake area; reconnaissance geological investigations in the North Spirit Lake area.
33.	Kostynuk, A. and Kostynuk, S.	Trenching in the Brownstone Lake area.
34.	Kostynuk, M.	Trenching in the Mink Lake area.
35.	Madsen Red Lake Gold Mines Ltd.	Ground electromagnetic and magnetometer surveys and diamond drilling in south central Fairlie Tp., surface diamond drilling in Baird Tp., diamond drilling south of North Spirit Lake.
36.	McBean Investments Ltd.	Diamond drilling in the North Spirit Lake area.
37.	McCoy Lake Mines Ltd.	Ground electromagnetic and magnetometer and geological surveys, trenching, and diamond drilling in the McCoy Lake area.
38.	Mextor Minerals Ltd.	Ground electromagnetic and magnetometer surveys in the Sydney Lake area.
39.	Midland Nickel Corporation Ltd.	Ground geophysical survey and diamond drilling in the Bruce Lake area.
40.	Minorex Ltd.	Airborne and ground electromagnetic and magnetometer surveys and trenching in the Setting Net Lake-Northwind Lake area.
41.	Murphy, J. A.	Ground electromagnetic survey in east central Mitchell Tp.
42.	Newconex Canadian Exploration Ltd.	Ground electromagnetic and magnetometer surveys and general prospecting in the Setting Net Lake area.
43.	New Jersey Zinc Exploration Co. (Canada) Ltd.	Geological survey in the McVicar Lake area.
44.	Newmont Mining Corporation of Canada Ltd.	Ground electromagnetic and magnetometer surveys and diamond drilling in the Dixie Lake area.
45.	Noranda Mines Ltd.	Diamond drilling in the North Spirit Lake area.
46.	Omar Exploration Inc.	Diamond drilling in the Bruce Lake area.
47.	Peterson Red Lake Mines Ltd.	General prospecting and diamond drilling in northwest Byshe Tp. and southwest Balmer Tp., electromagnetic survey and diamond drilling in central Balmer Tp.

	Individual or Company	Activities
48.	Pickands Mather and Co.	Magnetometer survey and diamond drilling in the North Spirit Lake area.
49.	Red Lake Syndicate, The	Ground geophysical surveys in the Uchi Lake-Confederation Lake area.
50.	Rouyn Exploration Ltd.	Ground electromagnetic, magnetometer, and geological surveys in Bowerman Tp.
51.	Roxmark Mines Ltd.	Diamond drilling in the Gerry Lake area.
52.	Selco Exploration Ltd.	Ground electromagnetic and magnetometer surveys in the Keezhik Lake area, the Miminiska Lake area, the Fort Hope area, the Birch Lake area and the Wesleyan Lake area; diamond drilling in Honeywell, Goodall, and Skinner Tp. and in the MacDowell Lake area.
53.	Serem Ltee.	Airborne and ground electromagnetic and magnetometer surveys and geological investigations in the Stull Lake and Muskrat Dam Lake areas.
54.	Sherritt Gordon Mines Ltd.	General exploration in the Muzhikoba Creek-Ghost Lake area.
55.	Slate Lake Mines Ltd.	Ground geophysical surveys and diamond drilling in the Slate Lake area.
56.	Smith, D. A.	General prospecting and trenching in the Wolf Bay area of Todd Tp.
57.	South Bay Mines Ltd.	Diamond drilling in Agnew, Dent, Earngey, and Mitchell Tp.
58.	Sudbury Contact Mines Ltd.	Ground electromagnetic and magnetometer surveys and diamond drilling in the Birch Lake area.
59.	Texas Gulf Sulphur Co. Inc.	Airborne and ground geophysical surveys, geological and geochemical surveys and diamond drilling in the Muskrat Dam Lake area; airborne and ground geophysical surveys in the McIntyre Lake area.
60.	Touchdown Syndicate (Selco-Cochenour)	Reconnaissance ground electromagnetic surveys and diamond drilling in Ranger Tp.
61.	Vanco Exploration of Ontario Ltd.	Ground electromagnetic and magnetometer surveys and trenching in Goodall and Skinner Tp., ground geophysical and geological investigations in the Birch Lake area.
62.	Union Miniere Exploration and Mining Corp. Ltd.	Ground geophysical and geological surveys and diamond drilling in the Kapkichi Lake-Central Patricia area.
63.	Yorbeau Mines Ltd.	Ground geophysical surveys, general prospecting and diamond drilling in the Troutlake River-Gerry Lake area.
64.	Zimmerman, J.	Magnetometer survey in central Ball Tp.

Shield, and are thought to be composed primarily of granulites and(or) their retrograded metamorphic equivalents. According to Bell the Pikwitonei Province forms a buffer zone between the Superior Province which, in Manitoba, unconformably(?) overlaps it on the south, and, on the north and west the Churchill Province with which it is at least in part in fault contact. In Manitoba along and near the west contact of the Pikwitonei Province lie the nickel-rich ultramafic bodies of the "Thompson Belt" and similar ultramafic rocks have been released by deep tectonic adjustments along the north contact of the Pikwitonei Province in the Fox River area and possibly below geophysically anomalous zones at Cedar and Pelican Lakes (Bell 1970). The primary objective of the exploration programs in the Winisk River area of northwestern Ontario is to ascertain whether or not such nickel-bearing ultramafic rocks occur along the apparent major northwest-trending fault, one of the subsidiary linear magnetic trends, or failing this, along the north contact of the Pikwitonei Province.

A list of exploration activities carried out in the Red Lake Resident Geologist's district during 1970 is given in Table 8.

ACCESS ROADS

Road building was active on three fronts within the district in 1970. All weather road access to the property of South Bay Mines Ltd. at Confederation Lake was completed early in 1970. Upgrading of the roadbed was continued throughout the summer and fall and was essentially completed by freeze-up.

The Anderson Lake road was extended for another 15 miles to the Nungesser River where a temporary crossing was erected pending the construction of a permanent installation in 1971. This road is now completed for a distance of 32 miles north of Highway 125 and the clearing of another 15 miles of right-of-way was in progress at year-end.

Work on Highway 808 north of central Patricia continued during the year with the completion of another 10 miles of roadway, for a total distance of 94 miles, and a two-span Bailey bridge over the Pipestone River. Right-of-way clearance north of the Pipestone River has been underway in anticipation of further grade construction in 1971.

NEW INFORMATION

Publications 1970

The following is a list of publications released in 1970 which pertain, in whole or in part, to the Red Lake Resident Geologist's district:

Ayres, L.D.
1970a: Setting Net Lake area, District of Kenora (Patricia Portion); Ontario Dept. Mines, Prelim. Geol. Map P.538 (revised), scale 1 inch to 1/4 mile.

1970b: Northwind Lake area, District of Kenora (Patricia Portion), p.3-7 in Summary of Field Work, 1970, by the Geological Branch, edited by E.G. Pye; Ontario Dept. Mines and Northern Affairs, MP43.

Ayres, L.D., and Raudsepp, M.
1970: Favourable Lake-Poplar Hill area, District of Kenora (Patricia Portion), p.7-12 in Summary of Field Work, 1970, by the Geological Branch, edited by E.G. Pye; Ontario Dept. Mines and Northern Affairs, MP43.

Davies, J.C., Pryslak, A.P., and Pye, E.G.
1970: Sioux Lookout-Armstrong Sheet, Kenora and Thunder Bay Districts; Ontario Dept. Mines, Geol. Comp. Series, Map 2169, scale 1 inch to 4 miles. Geological compilation 1965-66.

Ermanovics, I.F.
1970: Precambrian geology of Hecla-Carroll Lake map-area, Manitoba-Ontario (62P E1/2, 52M W1/2); Geol. Surv. Canada, Paper 69-42, 33p. Accompanied by Map 11-1969, scale 1:250,000.

Fenwick, K.G.
1970a: Lang-Cannon Lakes area (west half), District of Kenora (Patricia Portion); Ontario Dept. Mines, Prelim. Geol. Map P.581, scale 1 inch to 1/2 mile.
1970b: Lang-Cannon Lakes area, District of Kenora (Patricia Portion): p.18-21 in Summary of Field Work, 1970, by the Geological Branch, edited by E.G. Pye; Ontario Dept. Mines and Northern Affairs, MP43.

Ferguson, S.A., Brown, D.D., Davies, J.C., and Pryslak, A.P.
1970: Red Lake-Birch Lake Sheet, Kenora District; Ontario Dept. Mines, Geol. Comp. Series, Map 2175, scale 1 inch to 4 miles. Geological compilation 1966-67.

ODM-GSC
1970a: Sachigo River Aeromagnetic Compilation Map, Kenora District; Ontario Dept. Mines, Prelim. Map P.575, scale 1 inch to 16 miles.
1970b: Ekwan River Aeromagnetic Compilation Map, Kenora and Cochrane Districts; Ontario Dept. Mines, Prelim. Map P.576, scale 1 inch to 16 miles.
1970c: Ogoki River Aeromagnetic Compilation Map, Kenora, Thunder Bay and Rainy River Districts; Ontario Dept. Mines, Prelim. Map P.577, scale 1 inch to 16 miles.
1970d: Albany River Aeromagnetic Compilation Map, Algoma, Cochrane, Kenora, Sudbury, Thunder Bay, and Timiskaming Districts; Ontario Dept. Mines, Prelim. Map P.578, scale 1 inch to 16 miles.

Pryslak, A.P.
1970a: Dent Township, District of Kenora (Patricia Portion); Ontario Dept. Mines, Prelim. Geol. Map P.592, scale 1 inch to 1/4 mile.
1970b: Mitchell Township, District of Kenora (Patricia Portion); Ontario Dept. Mines, Prelim. Geol. Map P.593, scale 1 inch to 1/4 mile.
1970c: Corless and Knott Townships, District of Kenora (Patricia Portion); p.16-18 in Summary of Field Work, 1970, by the Geological Branch, edited by E.G. Pye; Ontario Dept. Mines and Northern Affairs, MP43.

Pye, E.G.
1970: Current Activities and Trends in Exploration in Ontario; Ontario Dept. Mines, MP37, 31p.

Riley, R.A.
1970a: Red Lake District, p.1-26 in Annual Report of Resident Geologists' Section, Geological Branch, 1969, pt.1; Ontario Dept. Mines, MP33.
1970b: Ball Township, District of Kenora (Patricia Portion); o.12-15 in Summary of Field Work, 1970, by the Geological Branch, edited by E.G. Pye; Ontario Dept. Mines and Northern Affairs, MP43.

Shklanka, R.
1970: Geology of the Bruce Lake area, District of Kenora; Ontario Dept. Mines, GR82, 27p. Accompanied by Map 2195, scale 1 inch to 1/2 mile.

Thurston, P.C.
1970: Kasabonika Lake Sheet, District of Kenora (Patricia Portion); Ontario Dept. Mines, Prelim. Geol. Map P.583, scale 1 inch to 2 miles.

Thurston, P.C., and Carter, M.W.
1970a: Lansdowne House-Fort Hope Sheet, District of Kenora (Patricia Portion) and Thunder Bay; Ontario Dept. Mines, Prelim. Geol. Map P.562 (revised), scale 1 inch to 2 miles.
1970b: Operation Fort Hope; Ontario Dept. Mines, MP42, 64p.

Assessment Work Received 1970

Table 9 is a list of all assessment work received at the Red Lake Resident Geologist's office in 1970.

Airborne Geophysical Data to Dec. 31, 1970

Table 10 and Figures 6, 7, 8, and 9 provide information on all the airborne geophysical data on file in the Red Lake Resident Geologist's office as of December 31, 1970. These data have been compiled as a matter of general interest for the mining and exploration public.

PROPERTY EXAMINATIONS

Big Beaverhouse Carbonatite (A)

Introduction

The Big Beaverhouse carbonatite is located about 23 miles west of Wunnummin Lake in northwestern Ontario (location A on Figure 7). It has a circular aeromagnetic expression about 3 miles in diameter and was first discovered by a GSC-ODM aeromagnetic survey flown in 1959-60. (See GSC-ODM geophysics paper 939G). In 1961, Many Lakes Exploration Co. Ltd., a subsidiary

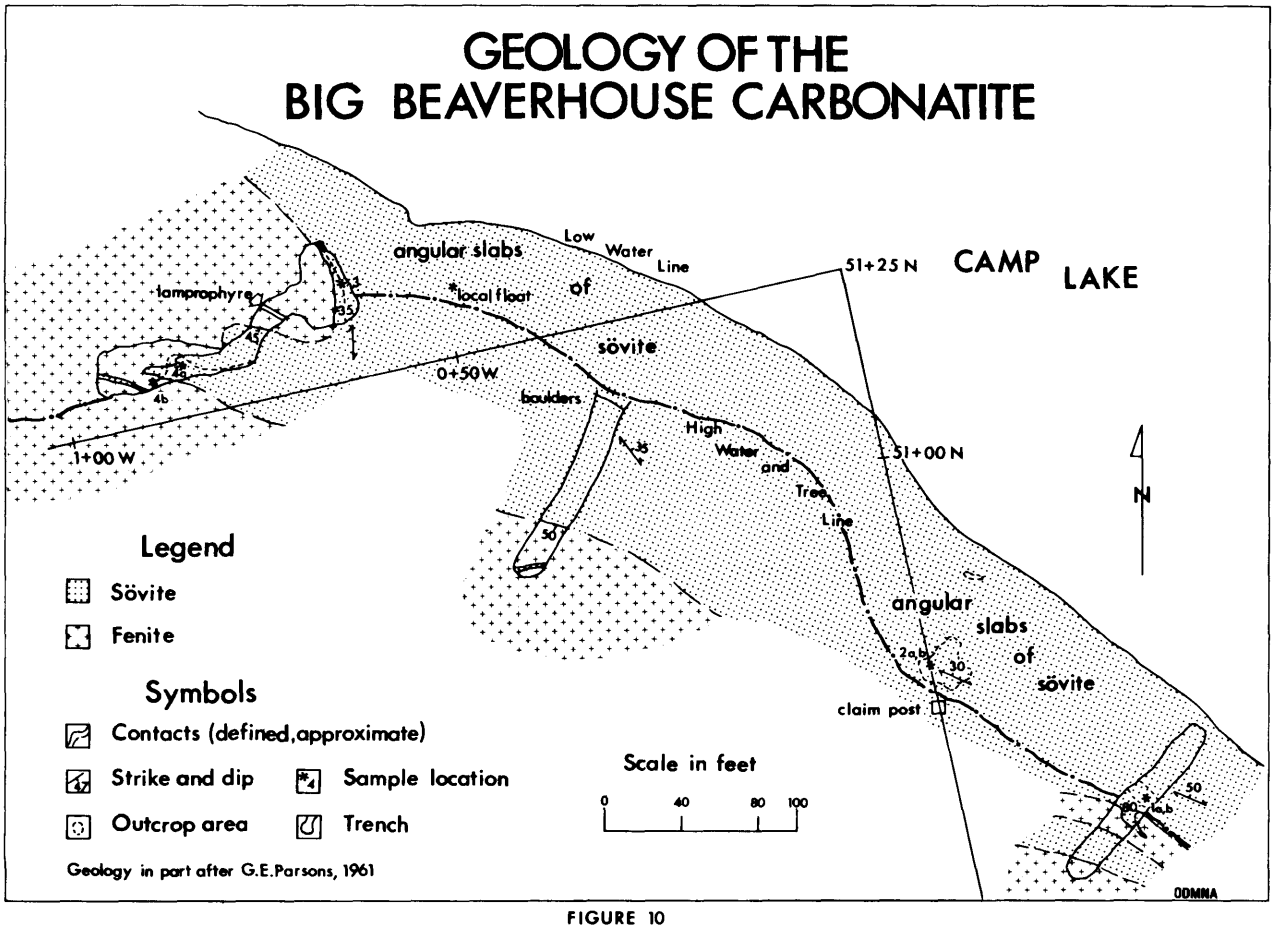

GEOLOGY OF THE
BIG BEAVERHOUSE CARBONATITE
angular slabs of sövite
Low Water Line
51+25 N
CAMP LAKE
lamprophyre
*local float
sövite
0+50 W
boulders
High Water and Tree Line
51+00 N
1+00 W
N
Legend
Sövite
Fenite
Symbols
Contacts (defined, approximate)
Strike and dip
Sample location
Outcrop area
Trench
Scale in feet
0 40 80 100
claim post
angular slabs of sövite
Geology in part after G.E.Parsons, 1961
ODMNA

FIGURE 10

Table 9 Assessment Work Received in 1970

Abbreviations:

Air	- Airborne	GC	- Geochemical Survey
Afmag	- Afmag Survey	GL	- Geological Survey
BM	- Base Metals	Mag	- Magnetometer Survey
cs	- core samples	Rad	- Radiometric Survey
DD(6) - 410'	- 6 diamond drill holes totalling 410'	SP	- Self Potential Survey
EM	- Electromagnetic Survey	Tr	- Trenching

Area	Ownership	Data	Metals Sought	NTS	File Number
Agnew Tp.	Canex Aerial Exploration Ltd. (Midland Nickel Option)	Air EM, Air Mag/1969.	BM	52N/2	Agnew Tp.
	Colleen Copper Mines Ltd.	EM, Mag/1969.	BM	52N/2	Agnew Tp.
	Copperville Mining Corp.	EM, Mag/1969.	BM	52N/2	Agnew Tp.
	Dome Exploration (Canada) Ltd.	Air EM/1969.	BM	52N/2	Agnew Tp.
	South Bay Mines Ltd.	DD(5) - 2104'/1969.	BM	52N/2	Agnew Tp.
Agnew Tp.-Dent Tp.	Noranda Exploration Co. Ltd.	EM, Mag/1969.	BM	52N/2	Agnew Tp.
Agnew Tp.-Earngey Tp.	South Bay Mines Ltd.	DD(2) - 620'/1969. DD(4) - 1538.6'/1970.	BM	52N/2	Agnew Tp.
Ball Tp.	Aiken-Russet Red Lake Mines Ltd.	GL, Mag/1968.	BM,Au	52M/1	Todd Tp.
	Cochenour Explorations Ltd.	GL, GC, EM/1969.	BM	52M/1	Ball Tp.
Balmer Tp.	Peterson Red Lake Mines Ltd.	DD(2) - 429'/1970.	BM,Au	52N/4	Balmer Tp.
	Touchdown Syndicate (Selco-Cochenour)	DD(2) - 709'/1969.	BM	52N/4	Balmer Tp.
Bateman Tp.	Cochenour Explorations Ltd.	EM/1966, EM, Mag/1969. DD(3) - 1038', cs/1969.	BM	52N/4	Bateman Tp.
Belanger Tp.	Copper-Lode Mines Ltd.	DD(1) - 295'/1969.	BM	52K/15	Belanger Tp.
	Muscocho Exploration Ltd.	Air EM, Air Mag/1969.	BM	52K/15	Belanger Tp.
	Phelps Dodge Corporation of Canada Ltd. (Zinc Metal Corp. Option)	GL, EM/1969.	BM	52N/2	Belanger Tp.
	Roxmark Mines Ltd.	Air EM, Air Mag/1968.	BM	52K/15	Belanger Tp.
	South Bay Mines Ltd.	DD(7) - 2436'/1969.	BM	52N/2	Belanger Tp.
Belanger Tp. - Knott Tp.	Cochenour Explorations Ltd.	GL, EM/1969.	BM	52N/2	Belanger Tp.
Belanger Tp. - Gerry Lake area	Copper-Lode Mines Ltd.	Air EM, Air Mag/1968.	BM	52K/15	Belanger Tp.
Bowerman Tp.	Armore Mines Ltd.	EM/1970.	BM	52K/15	Bowerman Tp.
	Hollinger Mines Ltd.	Air EM, Air Mag/1969.	BM	52K/15-52N/2	Bowerman Tp.
	Rouyn Exploration Ltd.	GL, EM, Mag/1970.	BM	52K/15	Bowerman Tp.
Bowerman Tp.	Selco Exploration Co. Ltd. (Cull Option)	EM, Mag/1969.	BM	52K/15-52N/2	Bowerman Tp.
	Selco Exploration Co. Ltd. (Heidman Option)	EM, Mag/1969.	BM	52K/15	Bowerman Tp.
	Selco Exploration Co. Ltd. (Kostynuk Option)	EM, Mag/1969.	BM	52K/15	Bowerman Tp.
	South Bay Mines Ltd.	DD(4) - 1244'/1969.	BM	52K/15-52N/2	Bowerman Tp.
Corless Tp.-Dent Tp.	Hanna Gold Mines Ltd.	EM, Mag/1970.	BM	52N/2	Corless Tp.
Dent Tp.	Alexander Red Lake Mines Ltd.	GL, GC, EM, Mag/1969. DD(4) - 1007'/1970.	BM	52N/2	Dent Tp.
	Canex Aerial Exploration Ltd. (Dalhousie Oil Option)	EM, Mag/1970.	BM	52N/2	Dent Tp.
	Red Lake Syndicate, The (Sheridan Geophysics)	EM/1969-1970.	BM	52N/2	Dent Tp.

Area	Ownership	Data	Metals Sought	NTS	File Number
Dent Tp.	South Bay Mines Ltd.	DD(10) - 4797'/1969.	BM	52N/2	Dent Tp.
Dent Tp.-Goodall Tp.	Canex Aerial Exploration Ltd.	Air EM/1969.	BM	52N/2	Dent Tp.
	Canex Aerial Exploration Ltd. (Midland Nickel Option)	Air EM/1969.	BM	52N/2-52N/7	Goodall Tp.
Earngey Tp.	Bohme, J. D. S.	EM, Mag/1969. DD(4) - 1275'/1970.	BM	52N/2	Earngey Tp.
	Falconbridge Nickel Mines Ltd.	Air EM, Air Mag/1969.	BM	52N/2	Earngey Tp.
	Hanna Gold Mines Ltd.	EM, Mag/1970.	BM	52N/2	Earngey Tp.
	Little Long Lac Gold Mines Ltd.	Air EM/1969.	BM	52N/2	Earngey Tp.
	South Bay Mines Ltd.	DD(2) - 756'/1969.	BM	52N/2	Earngey Tp.
Fairlie Tp.	Cochenour Explorations Ltd.	EM/1969.	BM	52N/4	Fairlie Tp.
	Madsen Red Lake Gold Mines Ltd. (Pine Option)	DD(1) - 506'/1970.	BM	52N/4	Fairlie Tp.
Goodall Tp.	Bralorne-Can Fer Resources Ltd.	Mag/1970.	BM	52N/7	Goodall Tp.
	Falconbridge Mines Ltd.	Air EM, Air Mag/1969.	BM	52N/2-52N/7	Goodall Tp.
	Selco Exploration Co. Ltd.	DD(6) - 765.5'/1970.	BM	52N/7	Goodall Tp.
	Vanco Exploration of Ontario Ltd.	Air EM, Air Mag, GL, Mag,SP/1969. EM, Mag/1970.	BM	52N/7	Goodall Tp.
Honeywell Tp.	Long Lac Mineral Exploration Ltd.	Air Mag, Air Rad/1968.	BM	52N/2-52N/7	Honeywell Tp.
	Selco Exploration Co. Ltd.	DD(1) - 555'/1970.	BM	52N/2-52N/7	Honeywell Tp.
Honeywell Tp.-Agnew Tp.-Goodall Tp.-Dent Tp.	Boylen, M. J.	Air EM, Air Mag/1969.	BM	52N/2-52N/7	Honeywell Tp.
Knott Tp.	Conwest Exploration Co. Ltd. (Carlson Option)	EM, Mag/1969.	BM	52N/2	Knott Tp.
Knott Tp.-Belanger Tp.	Conwest Exploration Co. Ltd.	EM, Mag/1970.	BM	52N/2	Knott Tp.
Knott Tp.-Mitchell Tp.	Dome Exploration (Canada) Ltd.	Air EM/1969.	BM	52N/2	Knott Tp.
McDonough Tp.	Cochenour Explorations Ltd.	DD(7) - 944'/1970.	Au,BM	52N/4	McDonough Tp.
Mitchell Tp.-Bowerman Tp.	North Rock Explorations Ltd.	EM, Mag/1969.	BM	52N/2	Mitchell Tp.
Mitchell Tp.-Dent Tp.	South Bay Mines Ltd.	DD(13) - 3462.5'/1969. DD(4) - 1618' /1970.	BM	52N/2	Mitchell Tp.
	South Bay Mines Ltd. (Gloster Option)	DD(3) - 1332.0'/1970.	BM	52N/2	Mitchell Tp.
Mulcahy Tp.	Cochenour Willans Gold Mines Ltd.	DD(4) - 539'/1968. DD(2) - 353'/1969.	BM	52M/1	Mulcahy Tp.
Ranger Tp.	Touchdown Syndicate (Selco-Cochenour)	DD(4) - 733'/1969. DD(4) - 912'/1970.	BM	52N/4	Ranger Tp.
Skinner Tp.	Noranda Exploration Co. Ltd.	EM, Mag/1969.	BM	52N/2-52N/7	Skinner Tp.
	Selco Exploration Co. Ltd.	DD(3) - 1109.5'/1970.	BM	52N/2	Skinner Tp.
Todd Tp.	Smith, D. and Solterman, R.	GL, GC, EM/1969.	BM,Au	52M/1	Todd Tp.
	Cochenour Explorations Ltd.	EM/1967, GL, GC, EM, Mag/1969, DD(8) - 2059.0'/1969.	BM	52M/1	Todd Tp.
	Aiken-Russet Red Lake Mines Ltd.	GL, Mag/1968.	BM,Au	52M/1	Todd Tp.

Area	Ownership	Data	Metals Sought	NTS	File Number
Willans Tp.	Touchdown Syndicate (Selco-Cochenour)	DD(2) - 400'/1969.	BM	52N/2	Willans Tp.
Avis Lake Area	Noranda Exploration Co. Ltd.	EM, Mag/1969.	BM	52K/16	52K/NE
Big Trout Lake Area	Canadian Nickel Co.	DD(3) - 598'/1969.	BM	53G/16	53G/NE
	Farrington, J.	DD(3) - 1686'/1970.	BM	53H/12	53H/NW
Birch Lake Area	Canex Aerial Exploration Ltd.	Air EM/1969, DD(3) - 2589'/1970.	BM	52N/7-52N/8	52N/SE
	Falconbridge Nickel Mines Ltd.	Afmag, Mag, DD(4) - 1577'/1970.	BM	52N/8	52N/SE
	Johnson, T. L.	Tr/1969.	BM,Au	52N/8	52N/SE
	Selco Exploration Co. Ltd.	EM, Mag/1970.	BM	52N/7-52N/8	52N/SE
Birch Lake Area (South Bay)	McGregor, A.	Air EM, Air Mag, Air Rad/1969.	BM	52N/8	52N/SE
Black Bear Lake Area	Cochenour Explorations Ltd.	EM/1966, 1969, DD(5) - 1140'/1970.	BM	52N/4-52N/5	52N/SE
Boyes Lake Area	Card Lake Copper Mines Ltd.	EM, Mag/1970, DD(3) - 2099'/1970.	BM	52O/12	52O/NW
Brownstone Lake Area	Kostynuk, A. and Kostynuk, S.	Tr/1970.		52N/9	52N/NE
Bruce Lake Area	Midland Nickel Corp. Ltd.	DD(1) - 1249'/1970.	BM	52K/14	52K/NW
	Omar Explorations Ltd.	DD(1) - 340'/1970.	BM	52K/14	52K/NW
Card Lake Area	Card Lake Copper Mines Ltd.	EM, Mag/1969.	BM	52O/11	52O/NW
Dixie Lake Area	Caravelle Mines Ltd.	Air EM, Air Mag/1969.	BM	52K/12	52K/NW
	Newmont Mining Corporation of Canada Ltd. (Caravelle Option)	DD(2) - 631.3'/1970, Physical property logs of 9 DD Holes/1970.	BM	52K/12	52K/NW
Favourable Lake-Bearhead Lake Area	Keevil Mining Group Ltd. (Cam Option)	DD(3) - 1104'/1969.	U	53C/13	53C/NW
	Keevil Mining Group Ltd. (Tudale Option)	Air EM(VLF), Air Rad/1969, DD(1) - 377'/1969.	U	53C/13	53C/NW
Ferdinand Lake Area	Madsen Red Lake Gold Mines Ltd. (Hager Option)	Tr/1969, DD(4) - 374', cs/1969.	MO	52O/4	52O/NW
Fredart Lake Area	Satellite Metal Mines Ltd.	EM, Mag/1969.	BM	52K/14	52K/NE
Gerry Lake Area	Roxmark Mines Ltd.	Air EM, Air Mag/1968, DD(4) - 2699'/1970.	BM	52K/14-52K/15	52K/NW
Gerry Lake-Troutlake River Area	Yorbeau Mines Ltd. (Hogan Mines Option in part)	Air EM, Air Mag/1969, DD(5) - 2162'/1970.	BM	52K/13-52K/14	52K/NW
Kapkichi Lake Area	Union Miniere Exploration and Mining Corp. Ltd.	EM, Mag/1969, DD(2) - 952'/1970.	Ni,Cu	52O/9	52O/NE
Kino Lake Area	Canadian Nickel Co.	DD(1) - 140'/1969.	BM	53G/15	53G/NE
Lang Lake Area	Algoma Steel Corporation Ltd., The	DD(8) - 879'/1970.	Fe	52O/12	52O/NW
	Belore Mines Ltd.	EM, Mag/1969, DD(5) - 1977'/1969.	BM	52O/11-52O/12	52O/NW
	Hanna Mining Co., The	DD(1) - 397'/1969, DD(5) - 3794'/1970.	Cu,Ag,Mo	52O/12	52O/NW
Makokibatan Lake Area	Amoco Canadian Petroleum Co. Ltd.	Air EM, Air Mag/1970.	BM	42M/5-42M/6	42M/SW
McCoy Lake Area	Low, Stephen	Tr/1970.	BM	53C/1	53C/SE
McVicar Lake Area	New Jersey Zinc Exploration Co. (Canada) Ltd.	GL/1969.	BM	52O/11	52O/NW

Area	Ownership	Data	Metals Sought	NTS	File Number
Mink Lake Area	Bralorne-Can Fer Resources Ltd.	GL/1969, 1970.	Mo	52N/8	52N/SW
	Kostynuk, M.	Tr/1970.	Au	52N/8	52N/SW
Muskrat Dam Lake Area	Canadian Onex Mines Ltd.	Air EM, Air Mag/1969.	BM	53G/4-53G/5-53F/1-53F/8.	53G/SW
	Canadian Nickel Co.	DD(1) - 106'/1969.	BM	53F/1	53F/SE
	Canadian Nickel Co.	DD(2) - 294'/1969, DD(2) - 853.1'/1970.	BM	53G/5	53G/SE
Muzhikoba Creek Area	Sherritt Gordon Mines Ltd.	Air EM, Air Mag/1969.	BM	43L/4	43L/SW
North Spirit Lake Area	Desmeules, G.	Tr/1970.	BM	53C/10	53C/NE
	Dickenson Mines Ltd.	DD(3) - 315', cs/1970.	Fe	53C/7	53C/SE
	Madsen Red Lake Gold Mines Ltd.	DD(5) - 579', cs/1970.	BM	53C/7	53C/SE
	McBean Investments Ltd.	DD(4) - 1600'/1970.	Fe	53C/10	53C/NE
	Noranda Exploration Co. Ltd.	DD(2) - 958.6'/1970.	BM	53C/7	53C/SE
	Noranda Exploration Co. Ltd. (Desmeules et al Option)	DD(4) - 1236.1'/1969.	BM	53C/7	53C/SE
	Scurry Rainbow Oil Ltd. (Desmeules et al Option)	DD(10) - 495.9'/1968.	BM	53C/7	53C/SE
Saddle Lake Area	Kennco Explorations (Canada) Ltd. (Mextor Option)	DD(4) - 1506'/1970.	BM	52O/12	52O/NW
	Mextor Minerals Ltd.	EM, Mag/1969.	BM	52O/12	52O/NW
Sandy Lake Area	Algoma Steel Corporation Ltd., The	DD(6) - 1452.1'/1970.	Fe	53F/3	53F/SW
Setting Net Lake Area	Conwest Exploration Co. Ltd.	GL, Mag/1969.	Mo	53C/13	53C/NW
	Minorex Ltd.	Tr/1969. DD(7) - 1947.5'/1969, Air EM, Air Mag/1970.	Mo	53C/13	53C/NW
Shabu Lake Area	Manderstrom, W.	DD(1) - 453'/1969.	BM	52N/7	52N/SE
Shabumeni Lake Area	Falconbridge Mines Ltd.	Air EM, Air Mag/1969.	BM	52N/7	52N/SE
	Noranda Exploration Co. Ltd.	EM, Mag/1969.	BM	52N/7	52N/SE
Shabumeni Lake-Swain Lake Area	Northwest Explorers (1967) Ltd.	Air EM, Air Mag/1969.	BM	52N/7	52N/SE
Slate Lake Area	Halren Mines Ltd.	EM, Mag/1969.	BM	52K/15	52K/NE
	Keevil Mining Group Ltd.	Mag/1969.	BM	52K/15	52K/NE
Snakeweed Lake Area	Phelps Dodge Corporation of Canada Ltd. (Copper-Lode (Rexdale) Option)	DD(6) - 3906'/1969.	Cu,Ag,Zn	52K/15	52K/NE
Swain Lake Area	Boylen, M. J.	Air EM, Air Mag/1969.	BM	52N/7	52N/SE
	Vanco Exploration of Ontario Ltd.	Air EM, Air Mag, GL, Mag, SP, 1969.	BM	52N/7	52N/SE
Troutlake River Area	Caravelle Mines Ltd.	Air EM, Air Mag/1969.	BM	52K/14	52K/NW
	Dome Exploration (Canada) Ltd.	Air EM/1969.	BM	52K/14	52K/NW
Uchi Lake Area	Dome Exploration (Canada) Ltd.	Air EM/1969, EM, Mag/1970.	BM	52N/2-52K/15	52N/SE
Washi Lake Area	Roberton, A.	Air EM, Air Mag/1969, DD(4) - 321'/1969.	BM	42M/6-42M/7	42M/SW
Wunnummin Lake - Mameigwess Lake Area	Conwest Exploration Co. Ltd.	Air EM, Air Mag/1970.	BM	43D/12-53A/7, 8, 9,10, 15	53A/NE
Zionz Lake Area	Fort Reliance Minerals Ltd.	Tr, Assays/1969.	BM	52O/5	52O/SW

Table 10 Airborne Geophysical Data on File as of December 31, 1970

The numbers correspond to the various numbered areas on Figures 6, 7, 8, and 9.

NO.	COMPANY	CONTRACTOR	TYPE	EQUIPMENT	YR.	AREA	FILE
1.	International Minerals & Chemicals Corp. Can. Ltd.	Canadian Aero	EM	Mullard low frequency inphase-outphase.			
			MAG	Elliot Electron-beam.			
			RAD	Nuclear Enterprises Mark VI-A.	1966	Lingman-Seeber Lakes	53F/NW
2.	Canadian Onex Ltd.	McPhar Geophysics	EM MAG	McPhar F-400. Varian V-4937 proton mag.	1969	Muskrat Dam Lake	53G/SW
3.	Keevil Mining Group Ltd.	Geophysical Engineering	VLF/EM	Barringer 2 channel radiophase		Favourable-North Spirit Lakes	
			RAD	McPhar AV. 13 channel spec	1968		53C/NW
	Keevil Mining Group Ltd. (Tudale Exploration Option)	Geophysical Engineering	VLF/EM	Barringer 2 channel radiophase			
			RAD	McPhar AV. 13 channel spec	1969	Favourable Lake	53C/NW
	Keevil Mining Group Ltd. (Cam Mines Option)	Geophysical Engineering	VLF/EM	Barringer 2 channel radiophase			
			RAD	McPhar AV. 13 channel spec	1969	Favourable Lake	53C/NW
4.	Minorex Ltd.	Questor	EM MAG	Barringer Mark V Input Barringer AM-101A	1970	Setting Net Lake	53C/NW
5.	Sherritt Gordon Mines Ltd.	Sherritt-Gordon	EM MAG	Hunting type (modified) Proton precession mag.	1969	Ghost Lake	43L/SW
6.	Conwest Exploration Co. Ltd.	McPhar Geophysics	EM MAG	McPhar F-400. Varian V-4937 proton mag.	1970	Wunnummin-Mameigwess Lakes	53A/NE
7.	Noranda Exploration Co. Ltd.	Questor	EM MAG	Barringer Mark V Input Barringer AM-101A	1969	North Spirit Lake	53C/SE
8.	Roberton, A.	Barringer	EM	Barringer maximum coupled, helicopter borne	1970	Washi-Makokibatan Lakes	42M/SW
9.	Mespi Mines Ltd.	Spartan Air Services	MAG	Varian proton mag.	1959	Baird Tp.-Heyson Tp.-Dome Tp.	Baird Tp. (General)
10.	Anglo Barrington Mines Ltd.	Aeromagnetic Services Ltd.	EM	Applied Research dual frequency			
			MAG	?	1957	Balmer Tp.-Bateman Tp.	Balmer Tp.
11.	Canex Aerial Exploration Ltd.	Canadian Aero	EM	Canadian Aero Mark IV	1969	Birch Lake	52N/SE
12.							
(a)	Boylen, M. J.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Swain Lake	52N/SE
(b)	Boylen, M. J.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Okanse Lake	Honeywell Tp.
	Dome Exploration (Canada) Ltd.	Canadian Aero	EM	Canadian Aero Mark IV	1969	Agnew Tp.	Agnew Tp.
(c)	Falconbridge Nickel Mines Ltd.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Shabumeni Lake	52K/SE
(d)	Canex Aerial Exploration Ltd. (Midland Nickel Option)	Canadian Aero	EM	Canadian Aero Mark IV	1969	Dent Tp.	Dent Tp.
(e)	Falconbridge Nickel Mines Ltd.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Goodall Tp.	Goodall Tp.
(f)	Vanco Exploration of Ontario Ltd.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Sundown Lake	Honeywell Tp.
(g)	Vanco Exploration of Ontario Ltd.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Swain Lake	52N/SE

NO.	COMPANY	CONTRACTOR	TYPE	EQUIPMENT	YR.	AREA	FILE
(h)	Vanco Exploration of Ontario Ltd.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Goodall Tp.	Goodall Tp.
(i)	Northwest Explorers (1967) Ltd.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Shabumeni Lake	52K/SE
13.	Long Lac Mineral Exploration Ltd.	Lockwood	EM MAG RAD	Dual frequency phase-shift Gulf Mark III Fluxgate Harwell 1531A	1969	Honeywell Tp.	Honeywell Tp.
14.	Huston, C. C.	Lockwood	EM MAG RAD	Dual frequency phase-shift Gulf Mark III Fluxgate Harwell 1531A	1969	Corless Tp.	Corless Tp.
15.	Huston, C. C.	Lockwood	MAG	Gulf Mark III Fluxgate	1968	Costello Tp. - McNaughton Tp.	Costello Tp.
16.	Canex Aerial Exploration Ltd. (Midland Nickel Option)	McPhar Geophysics	EM MAG	McPhar F-400. Varian V-4937 proton mag.	1969	Agnew Tp.	Agnew Tp.
17.	Salem Exploration	Dominion Exploration Syndicate	MAG	Dominion Exp. Syn. Vertical Fluxgate	1966	Uchi Lake	Earngey Tp.
18.	Falconbridge Nickel Mines Ltd.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Earngey Tp. (Birkett)	Earngey Tp.
19.	Copper-Lode Mines Ltd.	McPhar Geophysics	EM MAG	McPhar F-400. Varian V-4937 proton mag.	1968	Fredart-Gerry Lakes	Belanger Tp.
20.	Yorbeau Mines Ltd.	McPhar Geophysics	EM MAG	McPhar F-400. Varian V-4937 proton mag.	1969	Gerry Lake	52K/NW
	Roxmark Mines Ltd.	McPhar Geophysics	EM MAG	McPhar F-400. Varian V-4937 proton mag.	1969	Gerry-Fredart Lakes	Belanger Tp.
21.	Hollinger Mines Ltd.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Bowerman Tp.	Bowerman Tp.
22.	McGregor, A.	Canadian Aero	EM MAG RAD	Canadian Aero Mark IV Gulf Fluxgate Hamner gamma ray	1969	Exit Bay-Birch Lake	52N/SE
23.	Caravelle Mines Ltd.	Questor	EM MAG	Barringer Mark V Input Barringer AM-101A	1969	Troutlake River (Joy)	52K/NW
24.	Muscocho Explorations Ltd.	McPhar Geophysics	EM MAG	McPhar F-400. Varian V-4937 proton mag.	1969	Fredart Lake	Belanger Tp.
25.	Caravelle Mines Ltd.	Questor	EM MAG	Barringer Mark V Input Barringer AM-101A	1969	Dixie Lake	52K/NW
26.	Dome Exploration (Canada) Ltd.	Canadian Aero	EM	Canadian Aero Mark IV	1969	Uchi Lake	52N/SE
27.	Dome Exploration (Canada) Ltd.	Canadian Aero	EM	Canadian Aero Mark IV	1969	Troutlake River	52K/NW
28.	Dome Exploration (Canada) Ltd.	Canadian Aero	EM	Canadian Aero Mark IV	1969	South Bay - Confederation Lake	Knott Tp.
29.	Dome Exploration (Canada) Ltd.	Canadian Aero	MAG	Gulf Fluxgate	1957	Wenesaga Lake	52K/NW
30.	Falconbridge Nickel Mines Ltd.	Canadian Aero	EM MAG	Canadian Aero Mark IV Gulf Fluxgate	1969	Birch Lake	52N/SE
31.	[1]Larandona Mines Ltd. & Big Nama Creek Mines Ltd.	Boylen Engineering	MAG RAD	Lundberg fluxgate Nuclear Enterprises Mark XIV	1967	Echoing River	53K/SE
32.	Amoco Canada Petroleum Co. Ltd.	Questor	EM MAG	Mark V Input Barringer AM-101A	1970	Washi Lake	42M/SW

[1]Area lies close to provincial boundary, just north of Figure 6 limits.

of the E.I. Dupont de Nemours and Co. Inc., staked the magnetic anomaly and carried out an exploration program culminating in 3,207 feet of diamond drilling in 9 holes.

The area is covered by thick accumulations of moraine. The only rock exposures in the vicinity of the aeromagnetic anomaly are found on the south-east side of what is locally known as Camp Lake, about 2-3/4 miles south-southwest of the abandoned Hudson Bay post on Misamikwash Lake. Figure 10 indicates the extent of exposed outcrop in August of 1967.

General Geology

Three rock types are present along the south side of Camp Lake. The oldest is fenitized granitic country rock, patchy pink to blue-green in colour depending upon the amount of secondary amphibole developed in a given specimen. The rock consists of 5 to 10 percent quartz in various stages of replacement, between 50 and 70 percent albite secondary after more calcic plagioclase, various amounts of secondary riebeckite, calcite, phlogopite, and apatite, and accessory magnetite and pyrite.

Intrusive into the fenite as both large masses and small dikes is a massive fine- to medium-grained, pale pink calcite sovite containing whisps to well-foliated, thin lenticular blue-green masses of fine-grained riebeckite and apatite in amounts up to 60 percent. Phlogopite, magnetite, and pyrrhotite are common accessory minerals whereas pyrochlore, pyrite, and chalcopyrite are present in small or trace amounts.

A narrow, highly altered, biotite lamprophyre cuts the fenite on the west side of the exposure.

Economic Geology

Minor metamict pyrochlore occurs as small (0.5 mm), light brown octohedral crystals locally widely disseminated in massive sovite but more commonly associated with riebeckite-apatite concentrations. One drill log of Many Lakes Exploration Co. Ltd. describes 213 feet of diamond drill core in which pyrochlore is locally present in "narrow apatite zones" in amounts up to 10 percent. An average of 1 percent magnetite, ranging from small subhedral crystals to masses several centimetres in diameter is present throughout the sovite but is more abundant in riebeckite-apatite zones where it locally may form 5 percent of the rock. Minor exolved ilmenite lamellae orrur within the magnetite grains. Pyrite occurs in trace amounts as crystals and irregular grains in massive sovite or as trains of irregular grains associated with riebeckite-apatite concentrations. Rare chalcopyrite occurs as scattered small grains within both massive sovite and riebeckite-apatite zones. Diamond drill logs of Many Lakes Exploration Co. Ltd. indicate chalcopyrite to be locally present in small amounts in association with what was described as a mafic fenite consisting of varying proportions of magnetite, pyroxene, apatite, mica, and calcite.

Semiquantitative trace element analyses were run on several grab samples from the exposure area by the Laboratory and Research Branch, Ontario

Department of Mines and Northern Affairs. The results are given in Table 11.

Hermiston Property (B)

Introduction

In late 1970 this property consisted of one claim covering a small Zn-Pb-Ag showing located about 1,400 feet northeast of the north end of Keg Lake (location B on Figure 6). The showing, which lies in the northeastern corner of a low knoll, has been tested by several trenches, a local EM 16 survey by Dickenson Mines Ltd. in 1966, and a general JEM survey by Kerr Addison Mines Ltd. in 1968. The JEM survey indicated no conductors in the area; however Mr. Hermiston informed the writer that an anomaly was established by the EM 16 survey.

General Geology

The mineralization occurs in fragmental rocks of intermediate composition interpreted by the writer to be coarse pyroclastics. Fragments are up to 8 inches long and are commonly elongated parallel to the foliation which trends slightly north of east. Outcrop in the area is poor however and further investigation may show the host rocks to be coarse volcaniclastic sediments, the debris having been derived locally from the volcanic pile. Twenty-five feet south of and downdip from the showing, a small trench exposes a massive mafic rock in contact with the pyroclastic unit. Lack of exposure prevented tracing the contact to ascertain whether or not this rock is actually a mafic metavolcanic flow or a mafic dike.

Economic Geology

Two subparallel zones of mineralization occur. The northerly one has been traced for about 100 feet and averages about 18 inches thick. Twenty feet south a second zone has been traced for about 200 feet and also averages about 18 inches thick. The predominant sulphide is fine-grained pyrite which occurs in disseminations and narrow diffuse stringers and produces a distinctive rusty zone on the weathered surface. Within the pyrite zones are stringers ranging from a hairline to 3/4 inch thick containing black to dark brown sphalerite and fine-grained galena. The host rock in the mineralized zones appears to have been leached and is usually schistose due to the presence of abundant sericite.

A rough chip sample taken across one 18-inch rusty section of the northern zone gave 0.19 oz./ton Ag, 0.13 percent Pb, 0.53 percent Zn, and traces of Au and Cu upon assay by the Laboratory and Research Branch, Ontario Department of Mines and Northern Affairs. On the south zone a rough chip sample about 30 inches thick taken across a weakly mineralized zone about 5 feet west of the trench was also assayed by the Laboratory and Research Branch and gave trace Au and Ag. These samples were taken to exclude sphalerite-rich stringer zones.

Table 11 Semi-Quantitative Trace Element Analyses - Big Beaverhouse Carbonatite

Sample #	Sample Description	Trace Elements (ppm)											
	Lot I	Ba	Ce	La	Mn	Nb	Sr	Ta	Ti	Th	Y	Zr	$\%U_3O_8$ Equiv.
BBC-1a	Pale pink sovite with about 10% riebeckite-apatite and minor magnetite and pyrrhotite.	500	700	400	3000	1000	5,000	ND	3,000	ND	50	20	0.002
BBHC-1a	Mainly massive calcite from BBC-1a.	600	500	200	3000	200	6,000	ND	1,000	ND	50	10	ND
BBHC-3	Predominantly pink sovite with approx. 3% riebeckite-apatite concentrations, 2% pyrrhotite and magnetite, and trace pyrite and chalcopyrite.	500	500	200	3000	200	6,000	ND	200	ND	50	10	0.001
BBHC-Local Float	Massive sovite from sample composed of about equal amounts of blue-grey riebeckite-amphibole and massive pink calcite.	600	500	200	2500	ND	5,000	ND	10	ND	50	ND	0.001
	Limits of Detection (ppm)					40		1000	300			10	
	Lot 2												
BBHC-4a	Fenite	2000	ND	ND	1000	ND	400	ND	2000	ND	ND	120	0.007
Lamprophyre	Altered biotite lamprophyre	800	ND	ND	1000	ND	10,000	ND	12000	ND	ND	800	0.002
	Limits of Detection (ppm)	400	2000	600		200		6,000	40	2,000	40	60	

ND - Not Detected.

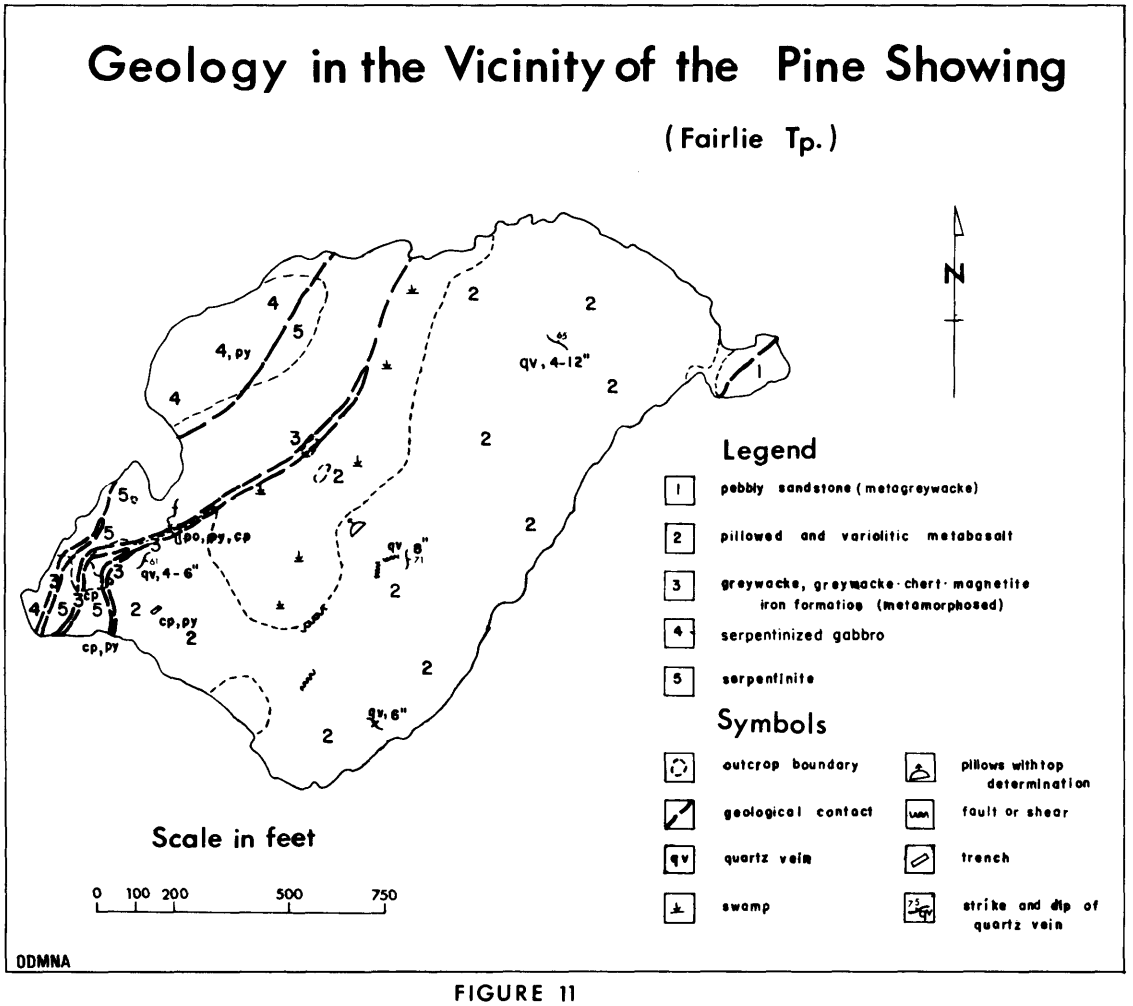

Geology in the Vicinity of the Pine Showing
(Fairlie Tp.)
N
Legend
1 pebbly sandstone (metagreywacke)
2 pillowed and variolitic metabasalt
3 greywacke, greywacke-chert-magnetite iron formation (metamorphosed)
4 serpentinized gabbro
5 serpentinite
Symbols
outcrop boundary
geological contact
qv quartz vein
swamp
pillows with top determination
fault or shear
trench
strike and dip of quartz vein
qv, 4-12"
qv, 4-6"
qv, 6"
po, py, cp
cp, py
Scale in feet
0 100 200 500 750
ODMNA

FIGURE 11

Madsen Red Lake Gold Mines Property (C)

(Pine Option)

Introduction

This property is located in southeastern Fairlie Township (location C on Figure 6) and is in part under option from Mr. Fuller Pine of Balmertown. The showing is located just west of the Dome Stock on the west end of the island on which the Department of Transport marker is located. To date limited trenching and ground geophysics have been carried out on the showing.

General and Economic Geology

The geology of the island is given in Figure 11. It appears that the asbestos-bearing serpentinite was intruded along bedding planes of the metasediment, separating it into three distinct units.

The metagreywacke-chert-magnetite iron formation contains up to 2 percent sulphides in the vicinity of the trench. Pyrrhotite, the predominant sulphide, and chalcopyrite occur along bedding planes and as fracture fillings. Malachite, in minor amounts, and traces of native copper are also present.

The south end of the large trench in the metavolcanic unit on the southwest end of the island exposes a mineralized zone averaging about 12 inches thick but up to three feet locally. The mineralization consists of minor pyrite, chalcopyrite, and malachite, with a six-inch thick lens of up to 10 percent splotchy chalcopyrite on the west side of the trench. Considerable coarse-grained amphibole and pods of coarse-grained carbonate are associated with the mineralization. South of the trench the zone averages about four inches thick, locally contains up to 2 percent chalcopyrite, and can be traced intermittently for about 200 feet.

Four samples were collected by the writer and assayed by the Laboratory and Research Branch, Ontario Department of Mines and Northern Affairs, with the following results. Two random grab samples of the iron formation from the large trench gave trace amounts of Au, Ag, Cu, Pb, Zn, Co, and Ni. A sample collected over the narrow mineralized zone in the north end of the trench ran 0.27 percent Cu and trace Au, Ag, Pb, Zn, Co, and Ni. A sample of the high-grade chalcopyrite pod assayed 3.97 percent Cu, 0.15 percent Zn, 0.23 oz. Ag, 0.01 oz. Au and trace amounts of Pb, Ni, and Co.

REFERENCES

Ayres, L.D., Bennett, G., and Riley, R.A.
1969: Geology and mineral possibilities in northern Patricia District, Ontario; Ontario Dept. Mines, MP28, 54p.

Bell, C.K.
1970: The Pikwitonei-Superior Churchill Boundary; Geol. Assoc. of Canada, Programs and Abstracts, Winnipeg, p.3 (abstract).

SAULT STE. MARIE DISTRICT

By

R.J. Rupert

CONTENTS

Sault Ste. Marie District

Tables

Figures

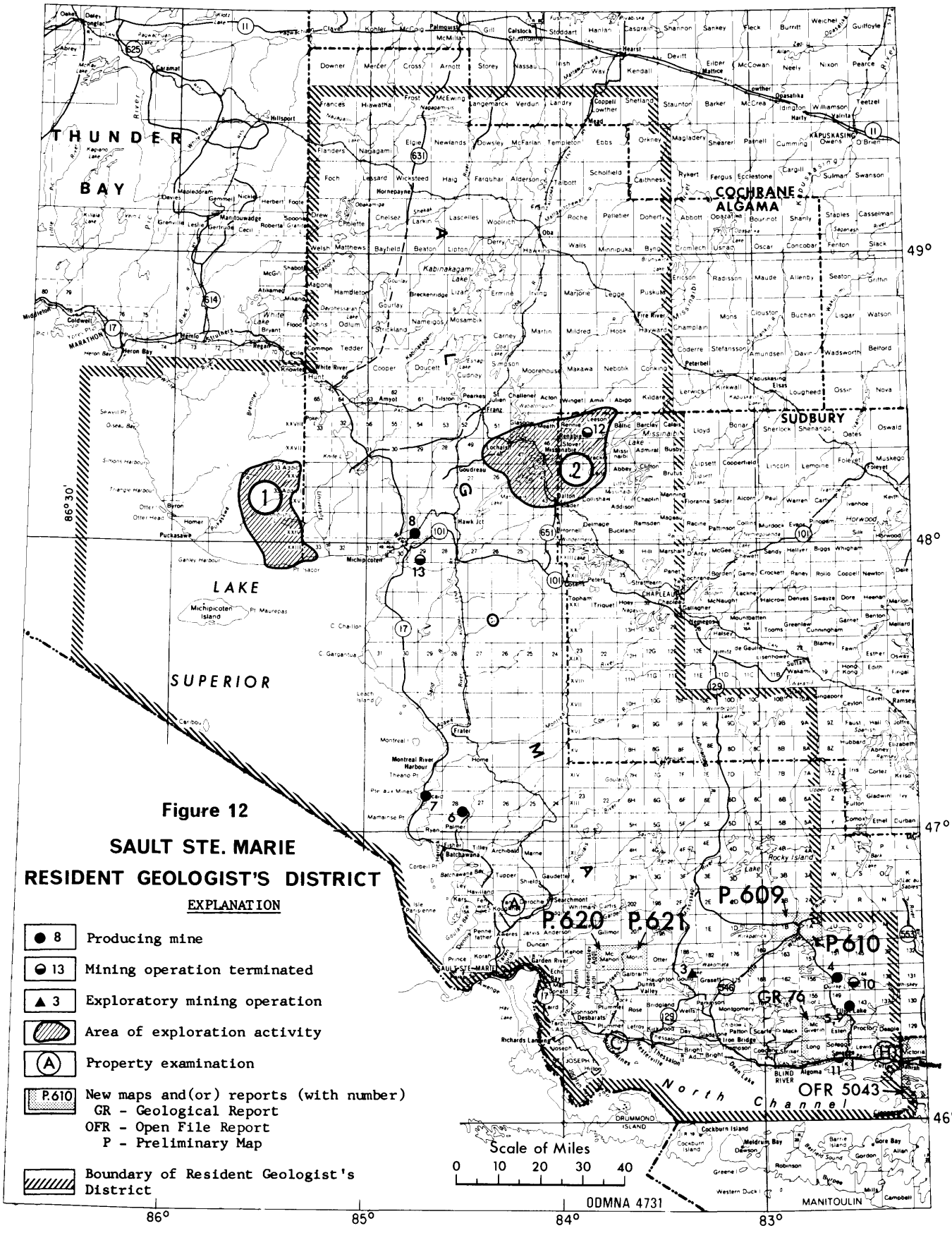


Figure 12

SAULT STE. MARIE

RESIDENT GEOLOGIST'S DISTRICT

EXPLANATION

- ● 8 — Producing mine
- ◒ 13 — Mining operation terminated
- ▲ 3 — Exploratory mining operation
- Area of exploration activity
- (A) — Property examination
- P.610 — New maps and(or) reports (with number)
  - GR - Geological Report
  - OFR - Open File Report
  - P - Preliminary Map
- Boundary of Resident Geologist's District

INDEX TO FIGURE 12

Areas of Exploration Activity

1. Pukaskwa and University River area
2. Missinaibi area

Exploratory Mining Operations

3. Gould Copper Mine

Producing Mines

4. Denison Mine, Denison Mines Ltd.
5. Quirke No. 1 Mine, New Quirke Mine, Rio Algom Mines Ltd.
6. Tribag Mine, Tribag Mining Co. Ltd.
7. Coppercorp Mine, Northern Canada Enterprises Ltd.
8. G.W. McLeod, Lucy Mines, The Algoma Steel Corp. Ltd.

Mining Operations Terminated

9. Nordic Mine, Rio Algom Mines Ltd.
10. Stanrock Mine, Stanrock Uranium Mines Ltd.
11. Pater Mine, Rio Algom Mines Ltd.
12. Renabie Mine, Renabie Mines Ltd.
13. Surluga Mine, Pango Gold Mines Ltd.

Property Examinations

A. W. Doughty Prospect, Vankoughnet Township
B. G. Solomon Prospect, Shedden Township
C. Huron-Bruce Mines Ltd., Taylor Shaft

SAULT STE. MARIE DISTRICT

By

R.J. Rupert[1]

INTRODUCTION

During 1970 the Sault Ste. Marie Resident Geologist's office was staffed by R.J. Rupert, Resident Geologist; Mrs. G. Nivins, secretary; Mr. S. Mirza, geological assistant and Mr. E.J. Leahy, geological assistant. Mr. Mirza was employed from April until October, and Mr. Leahy was re-employed by the Department in December.

On October 2 the office was moved to a new location at 370 Lake Street where core storage facilities and improved office services are available.

Core Library

Core specimens, particularly from stratigraphic bore holes in the Elliot Lake uranium mining area, were collected and catalogued. These are being stored in the core library at this office to provide a permanent and reasonably objective record of the costly exploratory drill programs currently in progress or recently completed along the north shore of Lake Huron. Specimens of core drilling from other areas are also being stored. The specimens have been obtained as donations or assessment work submissions from mining companies and as the result of sampling by departmental personnel. The attention of company geologists is again directed to Section 84, subsection 6 of the Mining Act which provides for assessment credits in respect of core specimens.

Mapping Projects

The Geological Surveys Section of the Department had three field parties working in this district during 1970 under J.A. Robertson, F.W. Chandler, and P.C. Thurston, and the writer was involved in two mapping projects.

J.A. Robertson mapped Townships 1A and 1B north of Elliot Lake (Location A on Figure 12) as part of the continuing program of 1 inch to 1/4 mile mapping in the Elliot Lake area. This project has resulted in a better understanding of the stratigraphy of the formations of the Cobalt Group including radioactive members of the Lorrain Formation, and has further defined the petrography of granophyric diabase intrusives associated with chalcopyrite and pitchblende occurrences in quartz veins.

F.W. Chandler mapped McMahon and Morin Townships on the western extension of the north limb of the Elliot Lake uranium belt (Location B on Figure 12).

---

[1]Resident Geologist, 370 Lake Street, Sault Ste. Marie.
Manuscript accepted for publication February 16, 1971.

His work has defined the basal formations, equivalent to the Hough Lake Group and Elliot Lake Group, which outcrop in this area. These formations are of particular interest because they are near uraniferous conglomerates which have been drilled in adjacent Morin, Aberdeen, and Kehoe Townships.

Operation Chapleau, a helicopter supported mapping project was completed in the summer of 1970 by P.C. Thurston, G.M. Siragusa, and R.P. Sage. This project has established the boundaries of several greenstone belts which were poorly known in the past and it located and defined a large body of anorthosite, previously unknown, which outcrops under an area of nearly 300 square miles. A preliminary map showing the results of this work is expected in 1971.

The writer spent about six weeks mapping parts of Township 29, Range 23 near Wawa as a part of a map compilation project in that area. A 1 inch to 1/4 mile data series map based on this field work and on mapping done by Pango Gold Mines and the Algoma Ore Division of The Algoma Steel Corporation will be published in 1971. The known extent of the acid volcanic pile in the Wawa area has been substantially extended by this project.

A 1 inch to 2 mile compilation sheet of the Wawa-Goudreau area (Lat. 47°30' to 48°30' and Long. 84°00' to 85°20') was completed and will be published early in 1971.

R.N. Annells of the Geological Survey of Canada spent the second of two field seasons mapping and studying the petrography of Keweenawan lavas along the east shore of Lake Superior.

During 1969, he established the nature of extensive intrusive acid sills on Michipicoten Island and his work will lead to a better understanding of the geology of Keweenawan vulcanism which is associated with many copper deposits.

M.J. Frarey of the Geological Survey of Canada spent several weeks in the Echo Bay area to complete his study of the stratigraphy of the Huronian rocks there.

PROPERTY EXAMINATIONS

Of the prospects examined by the writer during 1970, the following three are considered to have some economic promise.

W. Doughty Property, Goulais River (A)

An old mining property on which a shaft was sunk at the turn of the century has been re-examined and trenched by Mr. Doughty in Section 14 of Vankoughnet Township (Location A on Figure 12). The old shaft was sunk for gold and copper on an east-west band of steeply dipping graphitic schist in a sequence of basic flows. The top of the underlying flow immediately south of the graphite schist is intensely altered by carbonate minerals and contains low values in disseminated copper. This flow top is part of a flow of dioritic appearance with an unusually large proportion of feldspars. On the basis of a single thin section examined by the writer, the rock is classed as a trondhjemite.

The copper mineralization is found in carbonatized sections of the flow top for a horizontal width of about 100 feet south of the projected contact of the graphite schist and for over 700 feet in an east-west direction.

G. Solomon Property, Spanish (B)

A narrow quartz vein in or at the north contact of a granophyre sill which has a visually estimated grade of 0.5 to 2 percent copper across widths of a few inches to 2 feet, outcrops near the centre of Section 28, Shedden Township (Location B on Figure 12). The width and grade of the exposed vein improves for over 400 feet from the west end towards the east end where it disappears beneath overburden, and the grade is also inversely related to the distance between the vein and the subparallel contact between granophyre and quartz-mica schists.

A 1955 Turam EM survey plan by Panel Consolidated Uranium Mines Ltd., which is on file in this office shows a strong persistent anomaly extending eastwards from the new showing for over 2,500 feet. The EM profiles are in the form typical of steeply dipping narrow zones with good conductivity. There is no indication that this anomaly was ever drilled, and in fact, the report which accompanied the survey plan indicates that in 1955, it was not considered to be a significant anomaly by the interpreting geophysicist.

Taylor Shaft, Bruce Mines (C)

At Bruce Mines (Location C on Figure 12) Huron-Bruce Mines Ltd. has reactivated the Taylor Shaft from which copper ore was mined during the period from 1915 to 1921. In the prospectus of Huron-Bruce Mines Ltd., it is reported that the dewatering was done by Gome Diamond Drilling in return for the right to recover copper from mine waters. This attempt to recover copper was unsuccessful.

The underground workings, examined by the writer in September, 1970, extend for 1,960 feet along the strike of a persistent vein on the 155-foot level of the mine. The vein varies from a few inches to over 5 feet in width, with a distinct correlation between width of the vein and the strike of the vein. The best vein widths are in those sections of the vein which have a strike between 90 and 120 degrees, and sections with strikes between 130 and 145 degrees are generally too narrow to make ore. Vein sections with strikes between 120 and 130 degrees do not have ore widths at the west end of the workings, but do have ore widths at the east end. The result is a series of ore shoots displaced en echelon to the right.

The vein walls are sharp and there is no significant mineralization in the wall-rocks, although stringers of quartz do feather out into the wall-rock at angles to the veins. Minor structures in the vein indicate an eastwards plunge of about 45 to 60 degrees on the vein shoots.

Mineralogically, the vein is composed of white quartz with minor calcite and 10 to 15 percent of sulphides. The sulphides present are predominantly pyrite and chalcopyrite in approximately equal proportions, and very minor

amounts of bornite. In September, all the sulphides exposed in the drift were all completely covered with bornite stain, so accurate visual estimation of grade was impossible, but nothing was seen which would cast doubt on the sampling results of earlier operators who estimated an average grade of about 1.75 percent across an average width of about 4 feet. They estimated that 40,000 tons (320 tons per vertical foot) was minable above the bottom level. Presumably there is also similar undeveloped material below the level.

EXPLORATION ACTIVITY

A total of 1,792 claims (including claims on A.C.R. lands) were recorded in this district during 1970.

There was a heavy concentration of these claims in the areas of greenstone shown on the Operation Pukaskwa maps published by this Department in 1969 (Location 1 on Figure 12). These claims were staked in a rugged area during the winter of 1969 and 1970 in blocks of 50 to several hundred claims. Airborne geophysical surveys have now been completed over most of these claim blocks and ground surveys and drilling programs are now underway in an attempt to locate sulphide deposits associated with volcanic rocks.

In the region between Wawa and Missinaibi Lake (Location 2 on Figure 12) several hundred claims have been staked. Because of the relatively small size of individual claim blocks (6 to 50 claims each), this staking has not drawn so much attention, but this area is now about 60 percent staked, mainly by companies searching for both nickel deposits and copper-lead-zinc deposits. Several marginal or subeconomic deposits of stratiform base metal sulphides have been located here during the past decade and several extensive but unreported airborne surveys have been completed during the past few years.

Although the operations at Surluga Gold Mine have terminated, Pango Gold Mines is continuing an intensive exploration program in the surrounding area, mainly for nickel deposits similar to the Lakemount Mines Ltd. deposit near Hawk Junction.

Several companies are continuing intensive geophysical, geochemical, and diamond drilling programs in the Batchawana region near the operating Tribag and Coppercorp Mines.

As the result of the new foreign ownership laws pertaining to the uranium industry which were enacted in the spring of 1970, followed a few months later by the depressed outlook for uranium prices which was caused by discovery of large new reserves of uranium in Australia, exploration for new uranium deposits near Elliot Lake has been curtailed. Several million dollars have been spent in the past four years on diamond drilling in this area, but at present only one deep hole is being drilled, and all companies active in the area are reducing their level of activity. Most of their claims are being retained as long as possible in hopes of an improved outlook for uranium mining, and many extensive low-cost airborne surveys were completed during 1970 as a cheap means of obtaining enough assessment credit to hold these claims for several years. A few anomalies which could be caused by copper-bearing quartz veins have been located by these surveys, but only two are known to have been drilled.

Table 12 Assessment Reports Received in 1970

Abbreviations used: MAG - Magnetometer Survey; EM - Electromagnetic Survey; RAD - Radiometric Survey; AMAG, AEM, ARAD - Airborne Surveys; DD - Diamond Drilling

Township or Area	Owner	Commodity Sought	Assessment Work	File No.
Aberdeen	Canadian Johns-Manville Co. Ltd.	U	AEM, AMAG, ARAD, 33 claims, 1969.	SSM-1474
Aberdeen Add'l.	Allison, A.	Cu	Geol. Survey, 7 claims, 1970. Prospectus, 1970.	SSM-1563
	Canadian Johns-Manville Co. Ltd.	U	AEM, AMAG, ARAD, 27 claims, 1969.	SSM-1474
Aweres	Rundle, Murphy, Atkins	U	AEM, AMAG, 3.9 sq. miles, 1970.	SSM-1558
Brackin	Baltic Mines Ltd.	Au	Geol. Rept., 36 claims, 1948.	SSM-1516
	Burt, A. W.	Au	Geol. Rept., 7 claims, 1948.	SSM-1517
	Campbell, R.	Au	Geol. Survey, 9 claims, 1954.	SSM-577
Bridgland	D'Eldona Gold Mines Ltd.	U, Cu	ARAD, AMAG, AEM, 3.1 sq. miles, 1969.	SSM-1475
Chesley Add'l.	Canadian Johns-Manville Co. Ltd.	U	AEM, AMAG, ARAD, 33 claims, 1969.	SSM-1474
Cobden	Cominco Ltd.	U	DD Log, 1 hole, 4,397', 1969.	SSM-1456
	Kerr-McGee Corp.	U	ARAD, AMAG, AEM, 4.3 sq. miles, 1970.	SSM-1533
Duncan	Rundle, Murphy, Atkins	U	AMAG, AEM, 3.4 sq. miles, 1970.	SSM-1558
Galbraith	Kerr-McGee Corp.	U	ARAD, AMAG, AEM, 24 claims, 1970.	SSM-1531
	Paynter, R.	Cu	Trenching, 1969.	SSM-1471
Gaudette	MacDougall, D.	?	Trenching, 1970.	SSM-1545
Gladstone	Cominco Ltd.	U	ARAD, AMAG, AEM, 6.1 sq. miles, 1970. Partial DD Log, Hole Pat-1 to 4,600', 1969.	SSM-1534
Gould	Beaudin, R.	Cu	Trenching, 1970.	SSM-1100
	D'Eldona Gold Mines Ltd.	U, Cu	ARAD, AMAG, AEM, 7.5 sq. miles, 1969.	SSM-1475
	Gould Coppermine Ltd.	Cu	Rept. of Underground Advance, 1970.	SSM-1329
	Pellerin, F.	Cu	Trenching, 1969.	SSM-1047
	Pellerin, L.	Cu	Trenching, 1969.	SSM-1148
	Pellerin, U.	Cu	Trenching, 1970.	SSM-934
Grasett	D'Eldona Gold Mines Ltd.	U, Cu	ARAD, AMAG, AEM, 15 sq. miles, 1969.	SSM-1475
	Pacific Petroleums Ltd.	U	DD Log, 1 hole, 3,211', 1968.	SSM-1385
Hambleton	Canex Aerial Exploration Ltd.	Base Metals	MAG, 66 claims, 1969. EM & Kilocycle EM, 66 claims, 1969.	SSM-1492
	Canex Aerial Exploration Ltd.	Base Metals	DD Logs, 3 holes, 1,117', 1970.	SSM-1504
Haughton	Beaudin, A.	Cu	Trenching, 1969.	SSM-1162
	D'Eldona Gold Mines Ltd.	U, Cu	ARAD, AMAG, AEM, 3.1 sq. miles, 1969.	SSM-1475
	Lebel, Y.	Cu	Trenching, 1969.	SSM-1164
	Pellerin, L.	Cu	Trenching, 1969.	SSM-1148
Hayward	Granwick Mines Ltd.	?	Geol. Rept., 8 claims, 1957.	SSM-1484
Jarvis	Rundle, Murphy, Atkins	U	AMAG, AEM, 5.3 sq. miles, 1970.	SSM-1558
Kincaid	Keevil Mining Group Ltd.	Cu	EM & MAG, 33 claims, 1970. DD Logs, 2 holes, 257', 1970.	SSM-1509
Kirkwood	Anthony, H. W.	Cu	Trenching, 1969.	SSM-1191
Lake Huron, North Channel	Aggressive Mining Ltd.	U	DD Logs, 3 holes, 3,365', 1968, 1969.	SSM-1453
	Texas Gulf Sulphur Co. Ltd.	U	Geol. Rept. on Drilling; DD Logs, 10 holes, 6,703', 1969.	SSM-1375
	United Nuclear Mines (Canada) Ltd.	U	DD Logs, 4 holes, 2,902', 1970. Geol. & MAG, 1970.	SSM-1230
Lizar	Primrock Mining & Exploration Ltd.	Au	Geol. Rept., 1969. Assays Au. DD Logs, 2 holes, 250', 1969.	SSM-1444
Long	Adjudicated Copper Ltd.	Cu	DD Logs, 2 holes, 325', 1970.	SSM-1527
Mack	Cominco Ltd.	U	DD Log, 1 hole, 2,124', 1969.	SSM-1412
McMahon	Canadian Johns-Manville Co. Ltd.	U	AEM, AMAG, ARAD, 35 claims, 1969.	SSM-1474
Meath	Noranda Exploration Co. Ltd.	Ni, Cu	Geol. Rept., 12 claims, 1970.	SSM-1525
Montgomery	Kerr-McGee Corp.	U	AMAG, AEM, 8.6 sq. miles. ARAD, 15.3 sq. miles, 1970.	SSM-1529

Township or Area	Owner	Commodity Sought	Assessment Work	File No.
Otter	Bean, M.	Cu?	Trenching, 1970.	SSM-1538
Palmer	Keevil Mining Group Ltd.	Cu	EM & MAG, 4 claims, 1970.	SSM-1509
	New Senator-Rouyn Ltd.	Cu	SP Survey, 6 claims, 1969.	SSM-633
Parkinson	Cominco Ltd.	U	DD Log, hole no. M-1, 3,844', 1968. ARAD, AMAG, AEM, 8.0 sq. miles, 1970.	SSM-1261 & 1534
	Kerr-McGee Corp.	U	ARAD, AMAG, 10 claims, 1970.	SSM-1532
Patton	Cominco Ltd.	U	DD Log, hole no. P-1, 5,159', 1969. DD Log, hole no. P-2, 4,132', 1969.	SSM-1370
Rennie	Westfield Minerals Ltd.	Ag,Zn,Pb,Cu	IP Survey, 10 claims, 1969.	SSM-1015
Roche	Algoma Ore Properties, Algoma Steel Corp. Ltd.	?	DD Log, 1 hole, 365', 1969.	SSM-1485
Rose	McDougall, A. E.	Cu	Trenching, 1969.	SSM-1451
	Paynter, R.	Cu	Trenching, 1969.	SSM-1495
Ryan	Keevil Mining Group Ltd.	Cu	EM & MAG, 12 claims	SSM-1509
	Pall Mall Copper Mines Ltd.	Cu	DD Logs, 7 holes, 1,623.6', 1970. Assays Cu.	SSM-838
	Pall Mall Copper Mines Ltd.	Cu	EM, 28 claims, 1969. Geochemical Survey, 26 claims, 1968.	SSM-838
Scholfield	Boutin, J. P.	?	DD Logs, 3 holes, 204', 1957.	SSM-1482
	Caskanette, J. A.	?	DD Logs, 3 holes, 188', 1957.	SSM-1480
	Gaboury, J. P.	?	DD Logs, 2 holes, 82', 1957.	SSM-1479
	Kurki, J.	?	DD Logs, 5 holes, 178', 1957.	SSM-1478
	Vermette, G.	?	DD Logs, 9 holes, 389', 1957.	SSM-1481
Stover	Kaksonen, J.	Au	Geol. Rept., 3 claims, 1948.	SSM-1515
	Noranda Exploration Co. Ltd.	Base Metals	EM & MAG, 4 claims, 1969.	SSM-1487
	Seaboard Oil & Mines Ltd.	Au	Geol. Rept., 12 claims, 1949.	SSM-1513
	Thompson, A. F.	Au	Geol. Rept., 9 claims, 1948.	SSM-1514
Thompson	Kerr-McGee Corp.	U	ARAD, AMAG, AEM, 1.0 sq. miles, 1970.	SSM-1533
Walls	Canadian Nickel Co. Ltd.	Ni, Base Metals	DD Logs, 2 holes, 325', 1969.	SSM-1506
	Mitchell, D.	?	DD Logs, 2 holes, 68', 1957.	SSM-1477
	Sand River Gold Mining Co. Ltd.	?	DD Log, 1 hole, 1,106', 1957.	SSM-1473
Wells	D'Eldona Gold Mines Ltd.	U, Cu	ARAD, AMAG, AEM, 7.5 sq. miles, 1969.	SSM-1475
Q	Hollinger Mines Ltd.	U	Geol. Map, 3 claims, 1969. EM, MAG & RAD, 3 claims, 1969.	SSM-1470
	Mayfair Mines Ltd.	U	MAG & RAD, 15 claims, 1969.	SSM-1497
	Rice, C. F.	?	Trenching, 1970.	SSM-1498
U	Hollinger Mines Ltd.	U	Geol. Map, 3 claims, 1969. EM, MAG & RAD, 3 claims, 1969.	SSM-1470
	International Bibis Tin Mines Ltd.	U	DD Log, 1 hole, 301', 1968. Geol. Rept., 7 claims, 1968. Assays U, Th.	SSM-1289
U, (cont'd.)	Silver-Men Mines Ltd.	U	DD Logs, 7 holes, 3,032', 1968. MAG & RAD, 7 claims, 1968. Assays U, Th.	SSM-1228
	Sutherland, W. D.	Cu, U	AEM, AMAG & Scintillometer, 1.0 sq. miles, 1969.	SSM-1469
1A	Armore Mines Ltd.	U	RAD, 20 claims, 1968. Geol., 20 claims, 1968. Assays U, Th.	SSM-1227
	International Bibis Tin Mines Ltd.	U	DD Logs, 8 holes, 2,128', 1968. Geol. Rept., 16 claims, 1968. Assays U, Th.	SSM-1289
	Mayfair Mines Ltd.	U	EM & MAG, 9 claims, 1969.	SSM-1497
	Silver-Men Mines Ltd.	U	MAG & RAD, 16 claims, 1968. Assays U, Th.	SSM-1228
1F	Barcis, A.	Cu	Trenching, 1970.	SSM-1131
3H	Warren, W. G.	U?, Cu	Trenching, 1969,70.	SSM-780
22, Range 10	Cooper, W. J.	Cu	DD Logs, 4 holes, 837', 1969.	SSM-1430
23, Range 10	Idziak, B. R.	Base Metals	DD Logs, 10 holes, 1,952', 1969.	SSM-602
27, Range 12	Caputo, J.	Cu?	DD Logs, 2 holes, 338.5', 1968.	SSM-1337

Township or Area	Owner	Commodity Sought	Assessment Work	File No.
27, Range 13	Airnorth Mines Ltd.	Cu	EM, 16 claims, 1968. EM, 11 claims, 1969.	SSM-1494
	Keevil Mining Group Ltd.	Cu	MAG & EM, 56 claims, 1970.	SSM-1553
	New Senator-Rouyn Ltd.	Cu	SP Survey, 36 claims, 1969. DD Logs, 3 holes, 1,207', 1969.	SSM-633
28, Range 13	Keevil Mining Group Ltd.	Cu	EM & MAG, 29 claims, 1970.	SSM-1509
	New Senator-Rouyn Ltd.	Cu	SP Survey, 56 claims, 1969. DD Logs, 3 holes, 940', 1970.	SSM-633
28, Range 26	Cappellam, A.	Base Metals	DD Logs, 2 holes, 207', 1969.	SSM-1488
29, Range 23	Bohme, J. D. S.	Base Metals Au	MAG, 10 claims, 1970.	SSM-1537
	Pango Gold Mines Ltd.	Base Metals	MAG, 67 claims, 1970.	SSM-1501
29, Range 24	Pango Gold Mines Ltd.	Base Metals	MAG, 9 claims, 1970.	SSM-1501
30, Range 22	Carleton, Mrs. Blanche	Au	DD Logs, 6 holes, 1,511', 1970.	SSM-1354
33, Range 23	Rawhide 'U' Mines Ltd.	Base Metals	EM, 21 claims, 1970. Geochemical Survey, 21 claims, 1970.	SSM-1556
137	Canuc Mines Ltd.	U	Partial DD Log, hole #137-1 to 3,080', 1969.	SSM-1150
	Cominco Ltd.	U	DD Log, Mc-2, 5,375', 1969. Assays U_3O_8.	SSM-1415
	Kerr-McGee Corp.	U	Partial DD Log, hole #137-1 to 1,975', 1968. 12 Core Specimens, hole #137-1, 1,800'-1,975'. DD Log, hole #137-2, 5,343', 1969. 266 Core Specimens, hole #137-2, 0-5,343'.	SSM-1366
138	Kerr-McGee Corp.	U	Partial DD Log, hole #138-1 to 3,988', 1969. 56 Core Specimens, hole #138-1, 625'-1,390'.	SSM-1345
143	Kerr-McGee Corp.	U	ARAD, 151 claims, 1970. DD Log, hole #143-2, 3,509', 1967. 43 Core Specimens, hole #143-2, 2,525'-3,509'. Assays U_3O_8. DD Log, hole #143-3, 2,949', 1968. 78 Core Specimens, hole #143-3, 1,245'-2,949'. 9 Core Specimens, hole #143-3A, 2,721'-2,896'. DD Log, hole #143-5, 4,828', 1969. DD Log, hole #143-5A, 4,810', 1969. DD Log, hole #143-5B, 1,750'-1,772', 1969. Assays Cu, Pb, Zn. 74 Core Specimens, hole #143-5, 2,771'-4,625'. DD Log, hole #143-7, 4,494', 1969. 228 Core Specimens, hole #143-7, 0'-4,494'.	SSM-1192
144	Kerr-McGee Corp.	U	ARAD, 11 claims, 1970. DD Log, hole #144-1, 3,900', 1969. 74 Core Specimens, hole #144-1, 1,850'-3,900'.	SSM-1346
149	Stanrock Uranium Mines Ltd.	U	DD Log, hole #S-1, 3,895', 1969.	SSM-1178
150	Canuc Mines Ltd.	U	Partial DD Log, 1 hole to 3,148', 1969.	SSM-1150
150, (cont'd.)	Kerr-McGee Corp.	U	ARAD, 14 claims, 1970. DD Log, hole #150-1, 5,002', 1968. 82 Core Specimens, hole #150-1, 3,117'-5,002'. DD Log, hole #150-2, 4,920', 1968. 83 Core Specimens, hole #150-2, 3,387'-4,920'. DD Log, hole #150-4, 5,571', 1969. 219 Core Specimens, #150-4, 665'-5,571'. Partial DD Log, hole #150-5, 4,416', 1970.	SSM-1196
	Stanrock Uranium Mines Ltd.	Cu	DD Logs, 15 holes, 1,461.0', 1970.	SSM-1528
151	Sutherland, W. D.	Cu, U	AEM, MAG & Scintillometer Survey, 20.2 sq. miles, 1969.	SSM-1469
	United Nuclear Mines (Canada) Ltd.	U	AMAG, AEM, 10 sq. miles, 1970.	SSM-1557
155	Kerr-McGee Corp.	U	ARAD, 80 claims, 1970.	SSM-1550
	Western Nuclear Inc.	U	DD Log, hole #69-1, 3,058', 1969. DD Log, hole #69-2, 1,641', 1969.	SSM-1376
156	D'Eldona Gold Mines Ltd.	U	AMAG, ARAD, AEM, 0.6 sq. miles, 1969.	SSM-1476
	Kerr-McGee Corp.	U	ARAD, 146 claims, 1970. DD Log, hole #156-1, 5,394', 1969. 117 Core Specimens, hole #156-1, 2,875-5,394'. Assays U, Th. DD Logs, hole #156-2, 156-2A, 6,008', 1969. 79 Core Specimens, hole #156-2 & 156-2A, 4,325'-6,008'. DD Log, hole #156-3, 4,681', 1969. 197 Core Specimens, hole #156-3, 550'-4,681'. DD Log, hole #156-4, 5,408', 1970. 244 Core Specimens, hole #156-4, 0'-5,408'.	SSM-1367
	Labrador Mining & Exploration (Ont.) Ltd.	U	DD Logs, 3 holes, 6,230', 1969.	SSM-1455
	Mid-North Engineering Services	U	DD Log, hole #69-1, 2,391', 1969. DD Log, hole #70-1, 1,692', 1970.	SSM-1448
	Raylloyd Mines & Explorations Ltd.	U	DD Log, hole #R69-1, 0'-5,459', 1969.	SSM-1356
	St. Denis, A.	U	AMAG, AEM, 6.0 sq. miles, 1970.	SSM-1554
	Western Nuclear Mines Ltd.	U	DD Log, hole #69-3, 4,295', 1969.	SSM-1508

Township or Area	Owner	Commodity Sought	Assessment Work	File No.
157	The Astonish Lake Uranium Mining Corp. Ltd.	U	ARAD, 6 claims, 1969. RAD, 6 claims, 1969.	SSM-1507
	D'Eldona Gold Mines Ltd.	U	AMAG, ARAD, AEM, 3 sq. miles, 1969.	SSM-1476
	Keevil Mining Group Ltd.	U	ARAD, 11.2 sq. miles, 1970.	SSM-1436
	Moody & Pelchat	Cu	AEM, AMAG, 4.3 sq. miles, 1970.	SSM-1518
	St. Denis, A.	U	AMAG, AEM, 3.9 sq. miles, 1970.	SSM-1554
	Smerchanski, D.	Cu	Trenching, 1970.	SSM-1546
	United Nuclear Mines (Canada) Ltd.	U	AMAG, AEM, 13.5 sq. miles, 1970.	SSM-1557
161	Denison Mines Ltd.	U	MAG & RAD, 2 claims, 1970.	SSM-1555
162	Algoma Ore Division, Algoma Steel Corp. Ltd.	?	DD Logs, 4 holes, 438', 1970.	SSM-1505
	Atlantic Richfield Co.	U	ARAD, AMAG, AEM, 8.5 sq. miles, 1970.	SSM-1407
	Cominco Ltd.	U	ARAD, AMAG, AEM, 31 claims, 1970.	SSM-1535
	First National Uranium Mines Ltd.	U	MAG & RAD, 8 claims, 1969. Geol. Survey, 8 claims, 1969.	SSM-1489
	Gulf Minerals Co.	U	DD Log, hole #CG1-70 to 3,840.6', 1970.	SSM-1539
	Kerr-McGee Corp.	U	ARAD, AMAG, AEM, 9.6 sq. miles, 1970.	SSM-1530
	MacGregor, R. A.	U	AMAG, AEM, 28 claims, 1969.	SSM-1552
163	D'Eldona Gold Mines Ltd.	U	AMAG, ARAD, AEM, 25 sq. miles, 1969.	SSM-1476
	The Hanna Mining Co. Ltd. & The Hecla Mining Co. of Canada Ltd.	U	MAG, 35 claims, 1970. RAD, 3 claims, 1970. DD Logs, 9 holes, 6,973', 1968.	SSM-1490
	Morrison Nuclear Inc.	U	DD Log, 1 hole to 4,333', 1969.	SSM-1411
167	Fano Uranium Mines Ltd.	U	Location Plans for holes no's. 10, 11 & 12, 1969.	SSM-1324
	Kerr-McGee Corp.	U	ARAD, 14.8 sq. miles, 1970. AMAG, AEM, 9.7 sq. miles, 1970.	SSM-1529
	United Nuclear Mines (Canada) Ltd.	U	AMAG, AEM, 14 sq. miles, 1970.	SSM-1557
168	Atlantic Richfield Co.	U	ARAD, AMAG, AEM, 9.3 sq. miles, 1970.	SSM-1407
	Cannon Mines Ltd.	Cu	DD Logs, 5 holes, 1,700', 1969.	SSM-1223
	Cominco Ltd.	U	Partial DD Log, hole #Kee-2 to 3,712', 1969. Partial DD Log, hole #Kee-3 to 5,189', 1969. Partial DD Log, hole #Kee-4 to 3,457', 1970.	SSM-1443
	Falconbridge Nickel Mines Ltd.	U	Partial DD Log, 1 hole to 3,360', 1969.	SSM-1287
	Fidelity Mining Investments Ltd.	U	Partial DD Log, hole #F-1 to 2,664', 1970.	SSM-1486
	Kerr-McGee Corp.	U	ARAD, AMAG, AEM, 1.5 sq. miles, 1970.	SSM-1529
	Morrison Nuclear Inc.	U	Partial DD Log, hole #C-1 to 2,211', 1969. DD Log, hole #C-2, 4,544', 1970. Partial DD Log, hole #F-1 to 5,394', 1970.	SSM-1445
169	Atlantic Richfield Co.	U	ARAD, AMAG, AEM, 16.2 sq. miles, 1970.	SSM-1407
	The Hanna Mining Co.	U	DD Log, hole #16, 0'-3,002', 1969. 12 Core Specimens, hole #16, 0'-3,002'.	SSM-1422
	United Nuclear Mines (Canada) Ltd.	U	AMAG, AEM, 5.1 sq. miles, 1970.	SSM-1557
175	Falconbridge Nickel Mines Ltd.	U	Partial DD Log, hole #175, 100'-950', 1970.	SSM-1526
	Kerr-McGee Corp.	U	ARAD, 13.4 sq. miles, 1970. AMAG, AEM, 9.25 sq. miles, 1970.	SSM-1529
	Pacific Petroleums Ltd.	U	DD Log, hole #68-2, 4,345', 1968. 174 Core Specimens, hole #68-2, 0'-4,345'.	SSM-1396
	United Nuclear Mines (Canada) Ltd.	U	AMAG, AEM, 5.2 sq. miles, 1970.	SSM-1557
176	First National Uranium Mines Ltd.	U	MAG & RAD, 18 claims, 1968. Geol. Survey, 18 claims, 1968.	SSM-1489
182	United Nuclear Mines (Canada) Ltd.	U	AMAG, AEM, 13.4 sq. miles, 1970.	SSM-1557
M.13, Pukaskwa R.	King Island Mines Ltd.	Base Metals	ARAD, AMAG, AEM, 6.1 sq. miles, 1970.	SSM-1541
M.25, Herrick Lake	Hesse, W. A.	Cu	Trenching, 1969.	SSM-1472
M.29, Mussy Lake	Citadel Mines Ltd.	Mo	DD Logs, 9 holes, 2,804', 1969. MAG & EM, 4 claims, 1969. Geol. Survey, 3 claims, 1969.	SSM-1383

Table 13 Other Reports Received in 1970

Abbreviations used: Q.P. - Quarry Permit
DD - Diamond Drilling

Township or Area	Owner or Property Name	Commodity Sought	Type of Information	File No.
General	Denison Mines Ltd.	U	Description of Matinenda Subdivisions referred to in Denison logs.	SSM-1496
Aweres	Colleen Copper Mines Ltd.	Cu	Prospectus, 1970.	SSM-1560
Chapleau	Collings, W. H.	Sand & Gravel	Q.P.	SSM-1064
Esten	Bloxom, S. J.	Sand & Gravel	Q.P.	SSM-1512
	Elliot Lake, Corp.of Improvement Dist.	Sand & Gravel	Q.P.	SSM-1055
	Elliot Lake Lumber Co. Ltd.	Gravel	Q.P.	SSM-1519
Fenwick	Texas Gulf Sulphur Co.	U	Core Specimens of Jacobsville Sandstone, hole #F-1, 0'-1,940'.	SSM-1561
Gaudette	Fort Hope Explorations Ltd.	Base Metals	Prospectus, 1970.	SSM-1542
Gladstone	Martin, H. E.	Cu	Geol. Rept., 1962.	SSM-60
Haig	Wicksteed, Corp. of The Tp.	Sand & Gravel	Q.P.	SSM-1564
Haughton	Ont. Dept. of Lands & Forests	Gravel	Q.P.	SSM-1547
Herrick	Texas Gulf Sulphur Co.	U	Core Specimens of Jacobsville Sandstone from hole #H-1, 0'-1,200'.	SSM-1562
Hunt	Black, D. J.	Sand & Gravel	Q.P.	SSM-1217
	Canadian Pacific Rlwy.	Sand & Gravel	Q.P.	SSM-1088
	Sauriol, M. J.	Sand & Gravel	Q.P.	SSM-1083
	Spadoni Bros. Ltd.	Sand & Gravel	Q.P.	SSM-1219
I.R. #49, Gros Cap	Indian Affairs Branch	Fe	Rept. on Metallurgical Testing of an "Ore Sample" from Gros Cap I.R. #49.	SSM-1523
Lake Huron, North Channel	Texas Gulf Sulphur Co.	U	DD Logs, hole #70-1, #70-2 & #70-3, 1,240', 1970. Core Specimens and Sections for all drilling, 1968-1970.	SSM-1375
	United Nuclear Mines (Canada) Ltd.	U	42 Core Specimens, hole #68-1. 33 Core Specimens, hole #68-2. 50 Core Specimens, hole #68-3. 162 Core Specimens, hole #68-4. 19 Core Specimens, hole #68-5. 17 Core Specimens, hole #68-6. 13 Core Specimens, hole #69-1. 27 Core Specimens, hole #69-2. 3 Core Specimens, hole #69-3. 13 Core Specimens, hole #69-4. 43 Core Specimens, hole #70-1. 71 Core Specimens, hole #70-3.	SSM-1230
Lang	Algoma Ore Division, Algoma Steel Corp. Ltd.	TiO_2, Fe	DD Logs, 4 holes, 1,005', 1959. Geol. Rept., 1959. Assays TiO_2, Fe.	SSM-586
Long	Panel Consolidated Uranium Mines Ltd.	U	DD Logs, 2 holes, 244', 1955.	SSM-104
	Peach Uranium and Metal Mining Ltd.	U	DD Logs, 14 holes, 2,160.5', 1953.	SSM-1020
	Pronto Uranium Mines Ltd.	U	DD Logs, Plans, Assays and Sections for approximately 100 holes, 1952-1957. Geol. Repts., 1953, 1954.	SSM-1020
Meath	Maisondor Gold Mines Ltd.	Au	DD Logs, 5 holes, 769', 1950.	SSM-1565
Panet	Chapleau Lumber Co. Ltd.	Gravel	Q.P.	SSM-1522
	Chapleau, Municipality of	Sand & Gravel	Q.P.	SSM-1520
	Simon Ouellette Contracting Co. Ltd.	Gravel & Soil	Q.P.	SSM-1521
Patton	Knott & Charbonneau	Cu	Geol. Notes, 1960. Assays Cu.	SSM-1511
Plummer Add'l.	Huron-Bruce Mines Ltd.	Cu	Geol. Rept. and Historical Summary.	SSM-1543
Proctor	Bloxom, S. J.	Sand & Gravel	Q.P.	SSM-1066 & SSM-1512
Rennie	Wesson Mines Ltd.	Au,Ag,Zn,Pb	DD Logs, 10 holes, 1,149.2', 1947.	SSM-492
	Westfield Minerals Ltd.	Ag,Zn,Pb	DD Logs, 8 holes, 2,224.9', 1953.	SSM-1015

Township or Area	Owner or Property Name	Commodity Sought	Type of Information	File No.
Ryan	Canadian Pacific Railway	Sand & Gravel	Q.P.	SSM-1085
	Coppercorp Ltd.	Cu	Annual Reports, etc.	SSM-159
Scholfield	Continental Copper Mines Ltd.	?	EM & MAG, 12 claims, 1956.	SSM-1483
Spragge	Pater Uranium Mines Ltd.	U	DD Logs, 5 holes, 1,756', 1954. Plans and Sections, 1954. Geol. Repts., 1957, 1961, 1963.	SSM-531
	Pronto Uranium Mines Ltd.	U	Geol. Rept., 1957, 1959. Plans and Sections, 1957, 1959. DD Logs, 6 holes, 2,438', 1954.	SSM-1384
Talbott	Continental Copper Mines Ltd.	Base Metals	EM & MAG, 3 claims, 1956.	SSM-1483
Wells	Ont. Dept. of Lands & Forests	Gravel	Q.P.	SSM-1546
Wicksteed	Tp. of Wicksteed	Sand & Gravel	Q.P.	SSM-1344
1A	Albert, W. Ltd.	Sand & Gravel	Q.P.	SSM-1449
1F	Barcis, A.	Cu	Notice of Incorporation, 1970.	SSM-1131
5E	Seabrook Lake Area	N.A.	Geol. Note re Seabrook Lake Carbonatite.	SSM-1510
6E	Taman Uranium Mines Ltd.	U	Prospectus, 1970.	SSM-1503
22, Range 10	Polex Mines Ltd.	Base Metals	Prospectus, 1970.	SSM-1502
26, Range 12	Caputo, J.	Cu	Prospectus, 1970. DD Section, hole S-1, 257', 1968. Assays Cu.	SSM-1337
27, Range 12	Caputo, J.	Cu	Prospectus, 1970. DD Log, hole 1A-1, 81.5', 1968. Assays Cu.	SSM-1337
28, Range 15	Canadian Pacific Railway	Sand & Gravel	Q.P.	SSM-1086
28, Range 24	Soocana Mining Co. Ltd.	Au	Geol. Rept., 1937.	SSM-941
29, Range 14	Dejour Mines Ltd.	Cu	Prospectus with Report of Negative Results, 1970.	SSM-1355
29, Range 23	Miller, H. Construction	Top Soil	Q.P.	SSM-1057
	Pango Gold Mines Ltd.	Base Metals,Au	MAG, 23 claims, 1969, 1970. Geol. Survey, 22 claims, 1969.	SSM-1501
	Surluga Gold Mines Ltd.	Au	Composite Geological Mine Plan, 1970.	SSM-307
30, Range 19	Canadian Pacific Railway	Sand & Gravel	Q.P.	SSM-1084
30, Range 23	Blair, F. A.	Gravel	Q.P.	SSM-1244
	Cornell Properties	Sand & Gravel	Q.P.	SSM-1315
	Michipicoten, Tp. of	Sand & Gravel	Q.P.	SSM-1240
	Miller, H. Construction	Sand & Gravel	Q.P.	SSM-1386
	Ward Brothers	Sand & Gravel	Q.P.	SSM-1059
31, R. 27	Blair & Spencer	Sand & Gravel	Q.P.	SSM-1536
	Canadian Pacific Railway	Sand & Gravel	Q.P.	SSM-1089
46	Maisondor Gold Mines Ltd.	Au	DD Logs, 2 holes, 213', 1950.	SSM-1565
137	Teck Exploration Co. Ltd.	Cu	DD Logs, 11 holes, circa 1950.	SSM-478
143	Bloxom, S. J.	Sand & Gravel	Q.P.	SSM-1512
	Denison Mines Ltd.	Sand & Gravel	Q.P.	SSM-1241
	Stanrock Uranium Mines Ltd.	U	Geol. Rept. and Mine Plans, 1959.	SSM-816
144	Consolidated Denison Mines		Underground Progress Plans, 1956-1962. Underground Sections circa 1960.	SSM-373
	Denison Mines Ltd.	Sand & Gravel	Q.P.	SSM-1241
	Stanrock Uranium Mines Ltd.	U	Geol. Rept. and Mine Plans, 1959.	SSM-816
149	Algom Uranium Mines Ltd.	U	Underground Plans, circa 1956. Plans of DD hole Locations. Petrographic Studies and Reports.	SSM-701
	Beaupas Mines Ltd.	U	MAG, 7 claims, 1954. Geol., 7 claims, 1954.	SSM-1491
	Bloxom, S. J.	Sand & Gravel	Q.P.	SSM-1079
	Consolidated Callinan Flin Flon Mines Ltd.	U	DD Log, hole #B-6 to 4,327.5', 1957.	SSM-379
	Elliot Lake, Corp of Improvement Dist.	Sand & Gravel	Q.P.	SSM-1055
	Maddox, J. W.	Topsoil	Q.P.	SSM-1524
	Norsynco Mining & Exploration Co. Ltd.	U	DD Logs, 2 holes, 6,408', 1955, 1956.	SSM-698
	Stanrock Uranium Mines Ltd.	U	Geol. Rept. and Mine Plans, 1959.	SSM-816

Township or Area	Owner or Property Name	Commodity Sought	Type of Information	File No.
150	Albert, W.	Sand & Gravel	Q.P.	SSM-1243
	Algom Uranium Mines Ltd.	Limestone	Geol. Rept. on Limestone Quarry, 1955.	SSM-1389
	Beaupas Mines Ltd.	U	MAG, 4 claims, 1954. Geol., 4 claims, 1954.	SSM-1491
	Consolidated Denison Mines Ltd.	U	Underground Progress Plans, 1956-1962. Underground Sections, circa 1960.	SSM-373
	Denison Mines Ltd.	Gravel	Q.P.	SSM-1242
	Rio Algom Mines Ltd.	Sand & Gravel	Q.P.	SSM-1363
	Stanrock Uranium Mines Ltd.	U	Geol. Rept. and Mine Plans, 1959.	SSM-816
151	Sutherland and Associates	Cu	DD Logs, 3 holes. Assays Cu, Co, Ag. 70 Core Specimens.	SSM-708
155	Cameron, E.	Topsoil & Gravel	Q.P.	SSM-1408
156	Raylloyd Mines & Explorations Ltd.	U	Amendment to Prospectus, 1969.	SSM-1356
157	Astonish Lake Uranium Mining Corp. Ltd.	U	Rept. of Work Done, 1969.	SSM-1507
161	Denison Mines Ltd.	U	Assays for DD Log 69-3, 1969.	SSM-1369
162	Gulf Minerals Co.	U	Core Specimens DD hole CG-1-70, 0'-5,680', 1970.	SSM-1539
	Villeneuve & Ryan	U	Geol. Rept., 6 claims, 1969. RAD, 6 claims, 1969.	SSM-1418
163	The Hanna Mining Co. & Hecla Mining Co. of Canada Ltd.	U	Geol. Survey, 31 claims, 1969. MAG, 31 claims, 1969. RAD, 13 claims, 1969.	SSM-1382
168	North Summit Explorations Ltd.	Cu	Prospectus, 1970.	SSM-747
169	US-CA-MEX Exploration Co. Ltd.	Cu	Prospectus, 1970. Assays Cu.	SSM-1545
182	Renner, L.	Cu, Co	Trenching and Prospecting, 1970.	SSM-1559
M.13, Pukaskwa R.	King Island Mines Ltd.	Base Metals	Prospectus, 1970.	SSM-1541

Prospecting for cupriferous quartz veins along the North Shore of Lake Huron and in the district east of Ranger Lake along Highway 129 by individual prospectors and junior exploration companies continued through 1970.

In other parts of the district such as the Goulais River and Kabinakagami Lake greenstone belts, there has been only minor staking exploration activity.

MINING OPERATIONS

During 1970 both the Renabie Gold Mine and Pater Mine closed after reaching the economic limits of their deep pipe-shaped orebodies. Both mines have flooded and their mills are dismantled or idle. Stanrock Mine has terminated production of uranium by in situ leaching. The Taylor Shaft at Bruce Mines was dewatered for exploratory purposes during 1970, but no new producing mines have been established.

Except for the Tribag and Coppercorp Mines, other mining operations in this district have been continued at reduced rates on account of poor demand for both uranium and the relatively low grade (52 percent) of iron sinter produced at Wawa.

Mining operations in the district are summarized in Table 14.

Table 14 Summary of Mining Operations in 1970.

Mine Name	Operator	Location & Key Map Reference	Product & Remarks
Denison	Denison Mines Ltd.	Elliot Lake 4	Uranium producer.
Quirke	Rio Algom Mines Ltd.	Elliot Lake 5	Uranium producer.
New Quirke		Elliot Lake 5	Uranium producer.
Nordic		Elliot Lake 9	Uranium, care and maintenance only.
Stanrock	Stanrock Uranium Mines Ltd.	Elliot Lake 10	Uranium production from in situ leaching only. Closed March 1970. Care and maintenance only.
Pater	Rio Algom Mines Ltd.	Spragge 11	Copper producer. Operations terminated May 1970. Mine flooded, mill idle.

Gould	Gould Copper Mines	Gould Tp. 3	Copper, no production. Underground exploratory drifting and raising.
Tribag	Tribag Mining Co. Ltd.	Tp. 28, R.13 6	Copper producer.
Coppercorp	Northern Canadian Enterprises Ltd.	Batchawana 7	Copper producer.
G.W. MacLeod Lucy	The Algoma Steel Corp. Ltd.	Wawa Wawa 8	Iron producer. Iron producer.
Renabie	Renabie Mines Ltd.	Renabie 12	Gold producer. Operations terminated July 1970. Mine flooded and mill dismantled.
Surluga	Pango Gold Mines Ltd.	Wawa 13	Underground exploration. Terminated July 1970. Mine flooded.
Taylor Shaft	Huron-Bruce Mines Ltd.	Bruce Mines C	Copper, no production. Dewatered mine.

NEW MAPS AND PUBLICATIONS

Annells, R.N.
1970a: Volcanic studies of Michipicoten Island, Ontario, in Report of activities; Geol. Surv. Canada, Paper 70-1A, p.114-116 with map.
1970b: Keweenawan volcanic geology of Michipicoten Island, Lake Superior 16th Ann. Meeting, Inst. on Lake Superior Geology, Thunder Bay, Ontario.

Ayres, L.D.
1970: Synthesis of Early Precambrian stratigraphy north of Lake Superior, Abstract; 16th Ann. Meeting, Inst. on Lake Superior Geology, Thunder Bay, Ontario.

Bottrill, T.J.
1970: Geology and genesis of uranium deposits in the Huronian and associated geology, Blind River, Sudbury and Gowganda areas, Ontario; in Rept. of activities 1969; Geol. Surv. Canada, Paper 70-1A, p.57-58.

Cannon, W.F.
1970a: Plutonic evolution of the Cutler area, Ontario; Geol. Soc. Am., Bull. 81, p.81-94.

Cannon, W.F., and Gair, J.E.
1970: A revision of stratigraphic nomenclature for Middle Precambrian rocks in northern Michigan; Geol. Soc. Am., Bull. 81, No.9, p.2843-2846.

Chandler, F.W.
1970a: McMahon Township, District of Algoma; Ontario Dept. Mines and Northern Affairs, Prelim. Map P.620, scale 1 inch to 1/4 mile.
1970b: Morin Township, District of Algoma; Ontario Dept. Mines and Northern Affairs, Prelim. Map P.621, scale 1 inch to 1/4 mile.

Chandler, F.W., Young, G.M., and Wood, J.
1969: Diaspore in Early Proterozoic quartzites (Lorrain Formation) of Ontario; Can. J. Earth Sci., Vol. 6, No. 2, p.337-340.

Church, W.R., and Young, G.M.
1970: Discussion of the progress report of the Federal-Provincial Committee on Huronian stratigraphy; Can. J. Earth Sci., Vol. 7, No. 3, p.912-918.

Doig, R.
1970: An alkaline rock province linking Europe and North America; Can. J. Earth Sci., Vol. 7, No. 1, p.22-28.

Eisbacher, G.H.
1970: Contemporaneous faulting and clastic intrusions in the Quirke Lake Group, Elliot Lake, Ontario; Can. J. Earth Sci., Vol. 7, No. 2, p.215-225.

Eisbacher, G.H., and Bielenstein, H.U.
1970: Interpretation of clastic-strain-recovery measurements near Elliot Lake, Ontario; Can. J. Earth Sci., Vol. 7, No. 2, p.576-578.

Frarey, M.J., and Roscoe, S.M.
The Huronian Supergroup north of Lake Huron in Symposium on sedimentology in the Precambrian of Canada, ed. A. Baer; Geol. Surv. Canada, Paper 70-40. In press.

Lewis, C.F.M.
1969: Late Quaternary History of lake levels in the Huron and Erie Basins; Proc. 12th Conf. Great Lakes Research, Int. Assoc. Great Lakes Research, p.250-270.
1970: Recent uplift of Manitoulin Island, Ontario; Can. J. Earth Sci., Vol. 7, No. 2, pt.1, p.522-526.

Mothersill, J.S.
1970: Relationship of grain-size modes to nearshore sedimentary environments, Lake Superior, Ontario; Can. J. Earth Sci., Vol. 7, No. 2, pt.1, p.522-526.

Robertson, D.S., and Douglas, R.F.
1970: Sedimentary uranium deposits; CIMM Bull. 63, p.557-566.

Robertson, J.A.
1969: Geology and uranium deposits of the Blind River area, Ontario; CIMM Bull. 62, p.619-634.
1970: Geology of the Spragge area, District of Algoma; Ontario Dept. Mines, GR76, 109p. Accompanied by Maps 2185, 2186, scale 1 inch to 1/2 mile.

1970: Geology of the Massey Area, Districts of Algoma and Sudbury; Ontario Dept. Mines, Open File Rept. 5043, 150p. Accompanied by 3 maps, scale 1 inch to 1/4 mile.
1970: Township 1B, District of Algoma; Ontario Dept. Mines and Northern Affairs, Prelim. Map P.609, scale 1 inch to 1/4 mile.
1970: Township 1A, District of Algoma; Ontario Dept. Mines and Northern Affairs, Prelim. Map P.610, scale 1 inch to 1/4 mile.

Stonehouse, H.B.
1970: A description of the Penokean Province, Appendix in Oil and Gas Field Symposium; Michigan Basin Geol. Soc., Lansing, Michigan.

Stonehouse, H.B., et al.
1969: Studies of the Precambrian of the Michigan Basin; Michigan Basin Geol. Soc., Lansing, Michigan, 95p.

Thurston, P., Siragusa, G., and Sage, R.
1970: Operation Chapleau, District of Sudbury, Ontario in Summary of Field Work, 1970, by the Geological Branch, ed. E.G. Pye; Ontario Dept. Mines and Northern Affairs, MP43, p.50-57, and 2 maps.

Wood, J.
1970: Evidence for a tropical climate and oxygenic atmosphere in Upper Huronian rocks of the Rawhide Lake-Flack Lake area, Ontario, Abstract; 16th Ann. Meeting, Inst. on Lake Superior Geology, Thunder Bay, Ontario.

Young, G.M.
1969: Geochemistry of Early Proterozoic tillites and argillites of the Gowganda Formation, Ontario; Geochim. and Cosmochim. Acta, 33, p.483-492.
1970: Widespread occurrence of aluminous minerals in Aphebian quartzites, Abstract; 16th Ann. Meeting, Inst. on Lake Superior Geology, Thunder Bay, Ontario.

SOUTHERN ONTARIO DISTRICT

By

G.R. Guillet

CONTENTS

Southern Ontario District

Tables

Figures

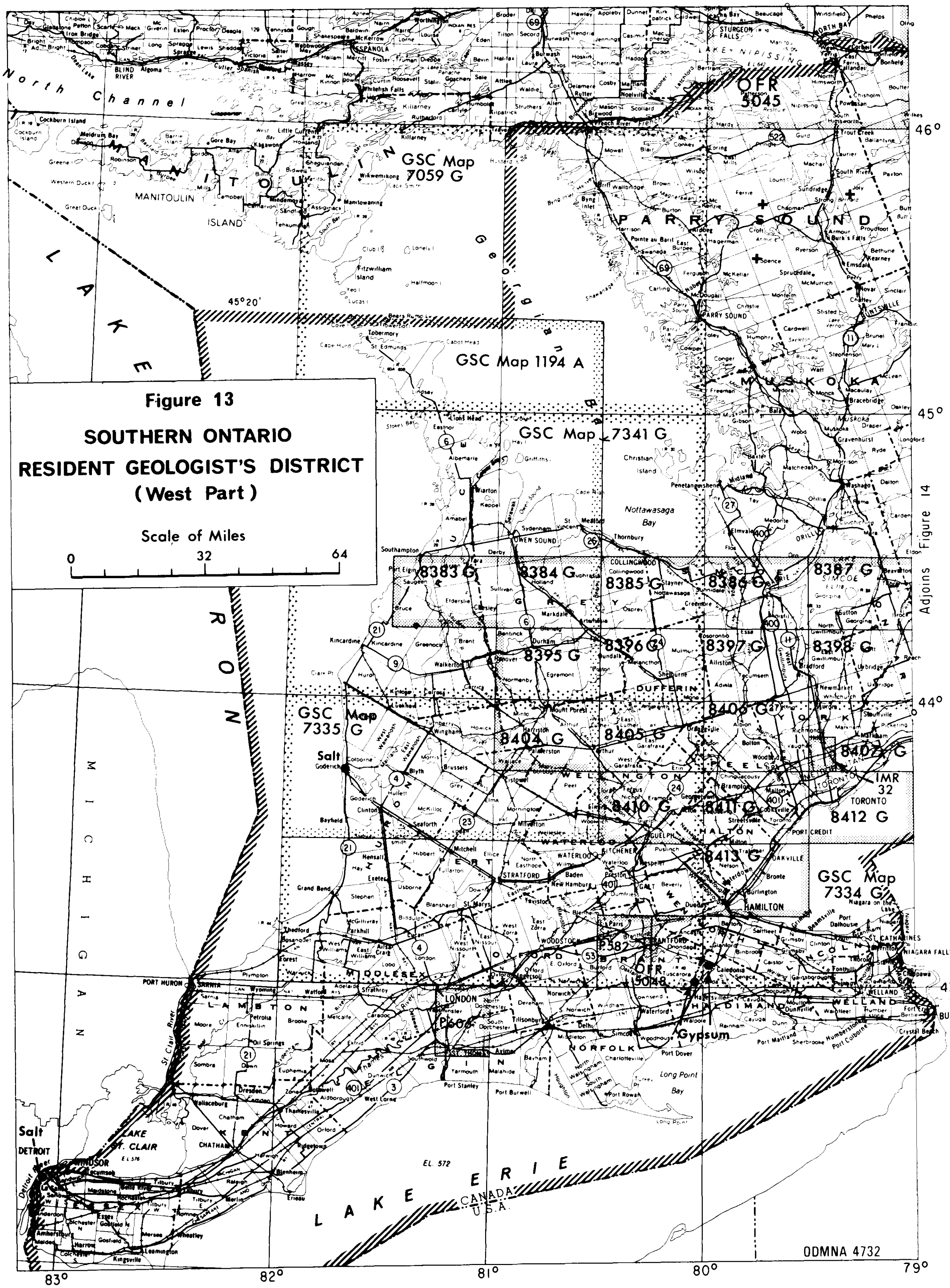


Figure 13
SOUTHERN ONTARIO
RESIDENT GEOLOGIST'S DISTRICT
(West Part)
Scale of Miles
0
32
64
GSC Map 7059 G
GSC Map 1194 A
GSC Map 7341 G
GSC Map 7335 G
GSC Map 7334 G
OFR 5045
OFR 5048
P582
P606
IMR 32 TORONTO
8383 G
8384 G
8385 G
8386 G
8387 G
8395 G
8396 G
8397 G
8398 G
8404 G
8405 G
8406 G
8407 G
8410 G
8411 G
8412 G
8413 G
Salt
Gypsum
Adjoins Figure 14
North Channel
MANITOULIN ISLAND
LAKE HURON
MICHIGAN
Georgian Bay
Nottawasaga Bay
PARRY SOUND
MUSKOKA
LAKE ST. CLAIR
LAKE ERIE
CANADA
U.S.A.
46°
45°
44°
43°
45°20'
83°
82°
81°
80°
79°
ODMNA 4732

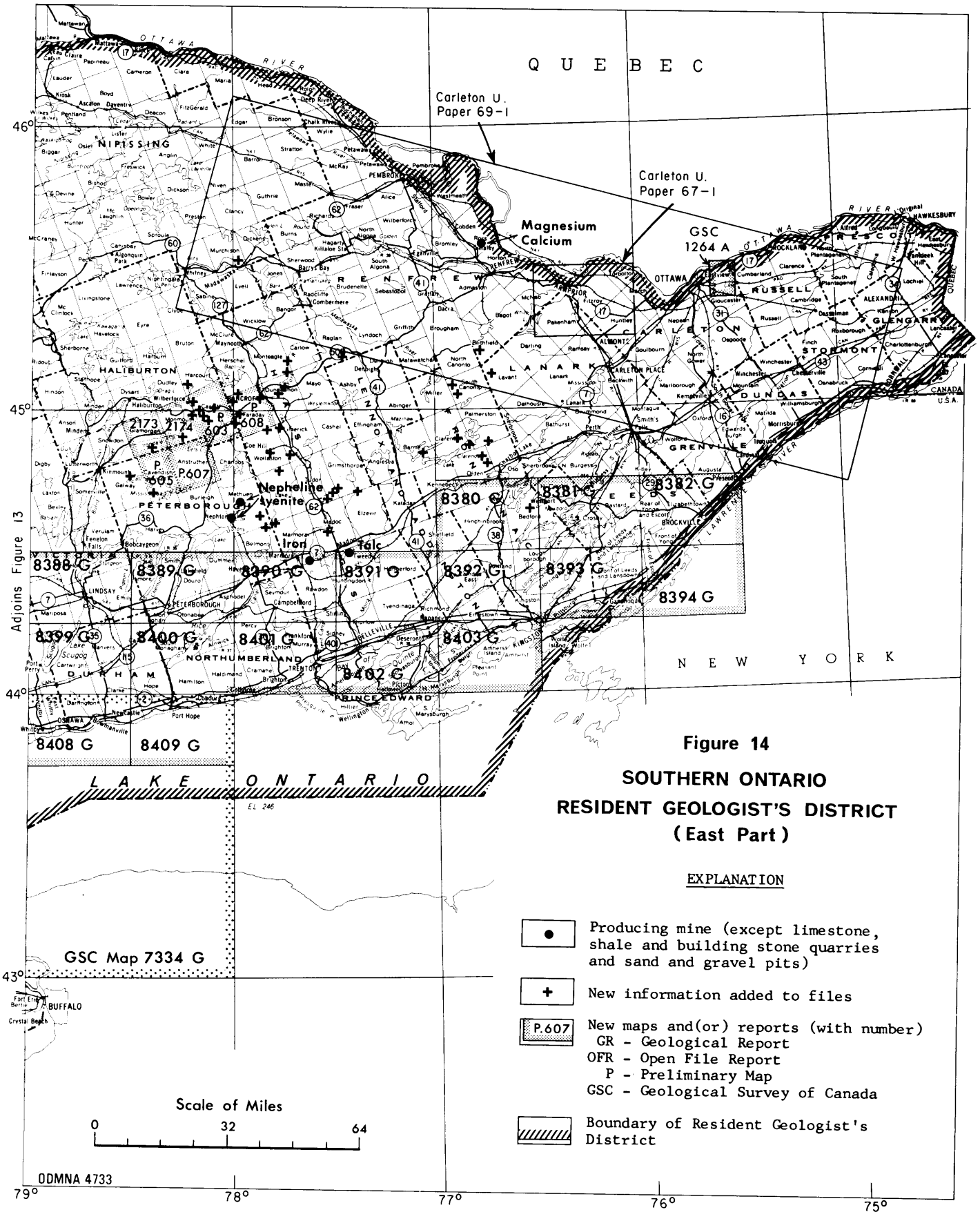


Figure 14

SOUTHERN ONTARIO
RESIDENT GEOLOGIST'S DISTRICT
(East Part)

EXPLANATION

- ● Producing mine (except limestone, shale and building stone quarries and sand and gravel pits)
- \+ New information added to files
- P.607 New maps and(or) reports (with number)
  - GR - Geological Report
  - OFR - Open File Report
  - P - Preliminary Map
  - GSC - Geological Survey of Canada
- Boundary of Resident Geologist's District

SOUTHERN ONTARIO DISTRICT

By

G.R. Guillet[1]

INTRODUCTION

Declining uranium exploration brought a notable drop in the District's overall activity. Although the Toronto office was not handling as many inquiries on pure exploration, it was much more involved with matters pertaining to surface mining in the urban and near-urban areas. Growing public concern for the environment, and the unfortunate lack of concern by many early gravel and stone producers, has resulted in the extractive industry facing an uncertain future in the more populated areas of the province.

Much of the work of the Toronto office was handled by Shirley Gibson, Geological Assistant. In addition to maintaining the files of assessment work and other information, Data Series maps were published for Cardiff, Cavendish, Anstruther, and Faraday Townships. These maps show the areas covered by assessment and other unpublished reports available in the Resident Geologist's files; the contents of these files are described in mimeographed notes that accompany each map. Inset geological and aeromagnetic maps are also shown on the Data Series maps.

A notable addition to the Resident Geologist's files were a series of uranium files donated by J. Satterly. Largely composed of information gathered in the 1950s, the files pertain mainly to activities in the Bancroft area.

A summer assistant, Janice Blair, prepared drift-thickness maps for the Perch and Sarnia sheets of the 1:50,000 National Topographic Series, using data from oil, gas, and water-well logs. Several other sheets in Lambton, Kent, and Essex Counties were partially completed.

Miss Blair also compiled information on the mineral occurrences of the Trent-Severn and Rideau canal systems for the National Parks plan.

Field work in Cyprus Lake Provincial Park in the Bruce Peninsula was carried out by Misses Gibson and Blair; a geological guidebook-brochure is in preparation.

An enlarged Industrial Minerals Section undertook a number of Pleistocene, Paleozoic, and industrial mineral studies in Southern Ontario. These are mentioned further in a later chapter.

---

[1]Resident Geologist, Parliament Buildings, Toronto 181.
Manuscript accepted for publication February 16, 1971.

The Data Retrieval and Education Section conducted mineral exploration classes in Toronto in February and March (both Basic and Special Topics courses) and October. One-day lectures were given at each of 13 Junior Ranger camps in Southern Ontario, and the large Resource Ranger camp near Bracebridge, during the summer months.

Department participation at rockhound events was largely in the form of display material and the distribution of brochures and reports.

MINING ACTIVITY

The mining economy of Southern Ontario is largely based on industrial minerals. The only metals produced from local minerals are magnesium and calcium; there is also one producer of iron ore. Uranium has not been produced since 1964. Oil and gas are produced in southwestern Ontario.

Mineral Production

Total mineral production (including oil and gas) in Southern Ontario in 1969 was valued at $220,608,357, essentially unchanged from 1968. Final figures are not available for 1970, but preliminary indications show a continuation of the levelling trend in production of most nonmetallic minerals.

Table 15 shows the production record for various commodities in 1969. Most of the construction materials showed slight declines over the previous year, but cement and nepheline syenite were moderately higher.

Table 15 Southern Ontario Mineral Production in 1969.

	Number of Producers	Quantity (tons)	Value (dollars)
Iron, magnesium, calcium	2	-	15,340,635
Sand and gravel*	186	64,173,384	38,743,891
Clay and shale products	47	-	31,482,405
Crushed stone	57	26,033,083	28,275,502
Cement	6	3,112,697	56,650,012
Lime	8	1,129,274	12,433,603
Gypsum	2	622,058	1,597,938
Building stone**	19	198,472	2,850,337
Salt	5	3,760,042	19,104,176
Nepheline syenite, talc	3	520,840	6,250,588
Peat	2	22,786	487,087
Natural gas		11,237,888 mcf.	4,275,152
Petroleum		1,161,889 bbl.	3,117,031
			220,608,357

* Includes all sand and gravel produced by, or sold to, Department of Highways, counties, and townships in Southern Ontario (17,834,899 tons valued at $5,740,305); not included in previous Resident Geologists' Annual Reports.

** Includes ornamental stone, special aggregates, roofing granules.

Quarry Permits

There were 77 quarry permits issued during 1970, a 50 percent increase over 1969. Quarry permits allow immediate commercial production of industrial minerals from Crown lands for a royalty fee of 10 cents per ton or cubic yard. Table 16 is a summary of the quarry permits issued in Southern Ontario for 1970. (Note: Operating permits are now required by extractive industries located along the Niagara Escarpment, but these should not be confused with "Quarry Permits" that apply to Crown land throughout the province).

Table 16 Quarry Permits Issued in 1970.

Commodity	Number of permits
Sand, gravel and fill	68
Quartz	3
Granite	2
Stone	1
Marble	1
Flagstone	1
Mica, amazonite, feldspar	1
	77

EXPLORATION ACTIVITY

Exploration activity was markedly lower in 1970 than in the previous year. Only 508 mining claims were recorded in 1970 compared with 2,919 in 1969. The total number of claims in good standing as of December 31, 1970, was 1,747.

The amount of assessment work recorded in 1970 was 30 percent lower than in 1969. Table 17 gives a breakdown by type of work.

Table 17 Assessment Work Recorded in 1970.

	Days of credit
Diamond drilling	18,548
Geophysical surveys	8,482
Manual labour	6,525
Power equipment	1,321
Geological surveys	1,011
	35,887

Companies and individuals engaged in exploration during 1970 are listed in Table 18.

Table 18 Exploration in 1970 (Compiled from assessment work files and new releases).

Company or Individual	Township	Work Done
Nickolas Axiotis	Blithfield	Trenching
W.A. Beninger	Marmora	Drilling
J.L. Campbell	Limerick	Pitting, stripping
Canada Costa Rica Mines Ltd.	Belmont	Plant test of bulk samples
Canuc Mines Ltd.	Monmouth	Drilling
Carndesson Mines Ltd.	Lavant	Drilling
A.H. Clark, Sr.	Wollaston	Magnetometer and EM surveys
Grasset Lake Mines Ltd.	Madoc	Drilling
Archie Haggerty	Joly	Geological survey, drilling
Frank Halas	Galway	Geiger counter and magnetometer survey
A.A. Hardy	Barrie	Trenching, stripping
H.K. Hesselmann	Cardiff, Tudor	Pitting
D.J. Holmes	Belmont, Glamorgan	Trenching, stripping
Indusmin Ltd.	Methuen	Drilling
Joseph Kakish	Burleigh	Geological survey
L.V. Lomas Chemical Co. Ltd.	Burleigh	Drilling
Lynx-Canada Explorations Ltd.	Olden	Geophysical survey, drilling
Macassa Gold Mines Ltd.	Limerick, Wollaston	Drilling, magnetometer surveys, metallurgical testing
Maclan Exploration Ltd.	Faraday	Drilling
T.F. Madden	Elzevir	IP survey, drilling, trenching
Mandarin Mines Ltd.	Glamorgan	Surface exploration
Megaton Mines Ltd.	Bedford	Drilling
Metalridge Mining Corp. Ltd.	Belmont, Marmora	Process research
Metals, Petroleum and Hydraulic Resources Consulting Ltd.	Spence	Magnetometer and EM surveys
Mid-North Engineering Services Ltd.	Cardiff	Drilling
Noranda Exploration Co. Ltd.	Tudor	Drilling
Norbaska Mines Ltd.	Miller	Surface exploration
Richore Gold Mines Ltd.	Conger	Airborne and ground spectrometer surveys, sampling, trenching
Earl Sager	Madoc	Drilling
Peter Simonds	Cardiff	Stripping
Solar Explorations Ltd.	Olden	Scintillometer survey
Swiss Oils of Canada (1959) Ltd. and G.C. Stevens	Galway	Geological and scintillometer surveys, drilling
Syngenore Explorations Ltd.	Lake	Drilling
M.R. Tripp	Methuen	Drilling
J.R. Wilson	Cardiff, Faraday	Trenching, stripping
R.J. Wright	Olden, Palmerston	Geological survey, trenching

Carndesson Mines Limited

A drilling program started in 1969 was completed in early 1970 on a mercury-copper-antimony-silver property near Clyde Forks in Lavant Township, Lanark County. The property, optioned by Carndesson Mines Limited from a private syndicate, was first opened in 1919 for barite but was poorly suited because of the abundance of disseminated sulphides. In recent years the barite-sulphide zone has been traced by diamond drilling and a short adit. Geochemical soil testing over a wide area underlain by the Grenville marble country rock has indicated a number of mercury anomalies.

The recent drilling program was designed primarily to test the known zone. Thirteen of the twenty-four holes intersected the zone along a strike length of 400 feet and for a distance of 600 feet down dip (The Northern Miner, April 2, 1970). The more attractive mineralized intersections reported by the company are given in Table 19. No significant mineralization was encountered in the other holes, most of which were purely exploratory.

Table 19 Carndesson Mines Limited, Drill Hole Assays

Hole No.	Core Length feet	Mercury percent	Copper percent	Antimony percent	Silver ounces
1	9.0	.035	.38	.75	2.1
3	1.7	.05	1.32	.62	2.28
4	4.0	.045	1.50	.68	1.97
5	1.6	.046	.95	.53	1.6
6	2.5	.02	.27	.38	1.7
7	2.5	.041	.45	.21	.53
10	14.2	.016	.50	.14	.41
12	2.8	.039	.46	.22	1.30
13	5.5	.024	.61	.20	.74
	1.9	.025	.30	.26	1.11
14	4.2	.02	.48	.22	1.00
16	15.0	.031	.57	.25	1.10
19	6.2	.05	.79	.39	2.01
20	3.0	.30	.67	.43	1.99

Lynx-Canada Explorations Limited

Renewed interest in the Long Lake Zinc Mine in Olden Township, Frontenac County, has resulted in some interesting drill core intersections. With a history dating back to 1897, and a small production of zinc and lead recorded during the period 1902-07, the property was recently optioned by Lynx-Canada Explorations Ltd. in partnership with Canadian Reynolds Metals Company Ltd.

Mineralization consists of sphalerite, pyrite, and marcasite with a little galena in a gangue of coarse calcite and diopside. The sulphides occur in lenses and narrow vein-like replacements in a band of marble that is flanked by gabbro and cut by felsite dikes and granite.

The deposit had been previously developed by a number of shallow shafts, open-cuts, and test-pits. About 350 feet of drifting was also reported; the deepest workings are 125 feet. The current exploration began with IP and EM surveys that indicated five anomalies. Drilling of the largest anomaly is continuing. Results reported by the Northern Miner (November 26, December 31, 1970) are given in Table 20.

Table 20 Lynx-Canada Explorations Limited, Drill Hole Assays

Hole No.	Core Length feet	Zinc percent	Lead percent	Silver ounces
5	8.6	16.4		
	3.8	37.5	2	1.5
7	7.8	5.7		
	1.8	15.0		
9	1.7	49.5		1.92
10	2.2	25.0		
11	8.6	30.0		
12	1.7	13.0		
	3.5	10.5		
	1.0	25.8		
15	11.5	20.0		
	1.2	7.2		
	4.7	11.3		
	1.0	23.1		
17	1.2	23.7		
	23.3	28.4		
	2.2	33.8		
18	10.7	16.6		
	1.3	22.9		
	4.5	16.4		
20	41.6	24.7		

Macassa Gold Mines Limited

Continued interest in its nickel-copper prospect in Limerick Township, south of Bancroft, was shown by Macassa Gold Mines Ltd. during 1969 and 1970. A further program of diamond drilling and metallurgical testing was involved.

According to The Northern Miner (April 9, 1970) reserves of 3,894,400 tons grading 0.825 percent nickel and 0.253 percent copper have been outlined to a depth of 1,100 feet. The deposit is a fine-grained concentration of pyrrhotite, pentlandite, pyrite, and chalcopyrite in a talc gangue, contained within a tongue of metapyroxenite associated with gabbro and metavolcanics.

INDUSTRIAL DEVELOPMENTS

Canada Cement Lafarge Limited

Plans for a new cement plant at Bath, 15 miles west of Kingston, have been announced by Canada Cement Lafarge Ltd. Estimated to cost $49 million the plant is designed for a production of 1,100,000 tons cement annually. Limestone is available at the plant site, and the company hopes to obtain sandstone from Pittsburgh Township, 12 miles east of Kingston, and transport it by barge to the plant.

Domtar Chemicals Limited

A $5.8 million expansion program is underway at the Goderich salt mine of Domtar Chemicals Ltd. Completion scheduled for early 1972 will increase salt production 36 percent to 2,250,000 tons annually. Increased Canadian and United States demands for rock salt for highway ice control and chemical processing has necessitated the expansion.

Kipco Metals and Chemicals Limited

A $10 million iron smelter is planned at Oshawa in conjunction with the development of the Multi-Minerals Ltd. magnetite-apatite deposit at Nemegos, Ontario. An anticipated production of 1,000 tons per day will consist of 700 tons of titaniferous magnetite concentrate to feed the new smelter, and 300 tons of nonmagnetic tailings which may be further treated by Multi-Minerals for their content of phosphate and rare earths. Development and operation of the mine and smelter is to be by a newly formed corporation, Kipco Metals and Chemicals Ltd.

GOVERNMENT ACTIVITIES

Department of Mines and Northern Affairs

The creation of a Northern Affairs Branch has resulted in not only a name change for the Department but certain staff changes as well. R.V. Scott has been made Director of the new branch, and has been succeeded in his former position of Director of the Mining Lands Branch by J.R. McGinn. The new Chief Mining Recorder is J.C. Smith. Designed as an information and communication link between northern Ontario and Queen's Park, the many offices of the Northern Affairs Branch are interconnected by a telex network.

The Petroleum Resources and Energy Board functions of the Department of Energy and Resources Management have been transferred to the Department of Mines and Northern Affairs. D.A. Sharp is Chief Engineer of the Petroleum Resources Section of the Mines Inspection Branch. A.R. Crozier is Chairman of the Ontario Energy Board.

Jurisdiction over the Ontario Northland Transportation Commission has also been transferred to this department. The Commission is responsible not only for the Ontario Northland Railway but extensive bus and truck transport systems and a telecommunications network throughout the north. The Chairman is W.A. Johnston.

The Niagara Escarpment Protection Act

Designed to protect the scenic qualities of the Niagara Escarpment against further mining encroachment, The Niagara Escarpment Protection Act was enacted on June 26, 1970. The new legislation, known as Bill 79, prohibits future quarrying of the Escarpment face and a strip of land 300 feet wide measured back from the face. It also provides for control of mining activities in a 4-mile zone that straddles the Escarpment. The regulations apply equally to existing as well as new operations.

Although concerned primarily with quarrying of the Lockport and Amabel dolomites which form the caprock of the Escarpment, and which are extensively used for crushed aggregate, the legislation also applies to shale and building stone quarries, and sand and gravel pits.

All present and proposed mining operations in the 4-mile protected zone must have a permit from the Minister of Mines and Northern Affairs. Permits may be issued following the receipt of an acceptable development and rehabilitation plan for the mining site, and after considering the recommendations of other government departments and those of the municipality.

Bill 79 was intended to be the forerunner for general legislation on standards of operation and rehabilitation for pits and quarries throughout the province.

Geological Field Studies

The Industrial Mineral Section is responsible for the whole area of environmental geology. In addition to industrial mineral reports, the section is involved in Pleistocene mapping, mineral resource inventories, and special studies.

Industrial mineral reports planned or in progress include revisions of the reports on the limestone industries, asbestos, salt, building stones, silica, and clay products. Mineral resource studies are underway on Ordovician and Silurian limestone, and on the mineral resources of the Oshawa and Niagara-Welland areas. Pleistocene mapping is planned or in progress for the Niagara-Welland, Windsor-Essex, Lucan, Orangeville, and Dundalk areas of Southern Ontario.

Mapping of the Paleozoic rocks of the Arnprior Sheet was completed. Paleozoic mapping of the middle and southern portions of the Niagara Escarpment is planned, and an atlas of stratigraphic sections is in preparation.

Bedrock mapping in the Mattawa-Deep River area of the District of Nipissing is planned by the Geological Surveys Section.

NEW INFORMATION

Assessment Reports

Work reports submitted for assessment credit are received from the Mining Recorder and placed on open file in both the assessment work library of the Mining Lands Branch and in the Resident Geologist's office. Reports received during 1970 are listed in Table 21. A number of older files recently transferred to the Resident Geologist's office are also listed.

Other Reports

Table 22 is a list of other reports added to the files in 1970. These are mainly copies of company prospectuses, sometimes accompanied by geological reports, filed with the Ontario Securities Commission.

Not listed, but available for examination in the Resident Geologist's office, are a number of uranium files donated by J. Satterly pertaining mainly to the Bancroft belt. These files contain information on the uranium activities of the 1950s, some of which may not have been preserved elsewhere.

1970 Publications, Ontario Department of Mines and Northern Affairs

Industrial Mineral Reports

IMR29 (reprinted) - Sand and gravel in southern Ontario, 1967-68 (including Map 2184); by D.F. Hewitt and W.R. Cowan.

IMR32 Pleistocene geology of the Thornhill area (including Maps P.244 (revised) and P.574); by P.F. Karrow.

IMR33 Pits and quarries: A guide to site development and rehabilitation; by A.M. Bauer.

IMR34 Urbanization and rehabilitation of pits and quarries; by D.F. Hewitt and M.A. Vos.

Miscellaneous Papers

MP36 Annual report of Resident Geologists' Section, Geological Branch, 1969, Part 4: Southern Ontario; by G.R. Guillet.

MP37 Current activities and trends in exploration in Ontario; by E.G. Pye.

MP40 The Geological Branch, its history, services and operations; by J.E. Thomson.

Table 21 **Assessment Reports Received in 1970**

County	Township	Ownership (Optionee)	Commodity Sought	Assessment Work	File No.
Frontenac	Barrie	A.A. Hardie (110 Sammon Ave., Toronto 6)		1970 - Trenching & stripping	Barrie 19
Frontenac	Clarendon	Alit-El Mines Ltd.	Uranium	1969 - Geological survey Scintillometer survey	Clarendon 7
Frontenac	Clarendon	Alit-El Mines Ltd.	Uranium	1969 - Bulk sampling	Clarendon 8
Frontenac	Clarendon	Consolidated Golden Arrow Mines Ltd. (Canadian Arrow Mines Ltd.)	Uranium	1970 - Magnetometer survey Spectrometer survey	Clarendon 9
Frontenac	Olden	R.J. Wright (P.O. Box 49, Toronto-Dominion Centre, Toronto 1) (Keevil Mining Group Ltd.)	Uranium	1969 - Property report Geological survey Scintillometer survey (airborne & ground)	Olden 8
Frontenac	Olden	R.J. Wright (The Uranium Syndicate)	Uranium	1970 - Trenching	Olden 9
Frontenac	Oso & Palmerston	R.J. Wright (Keevil Mining Group Ltd)	Uranium	1969 - Airborne scintillometer survey	Olden 8
Frontenac	Palmerston	John Eastman (Box 98,Havelock)	Uranium	1969 - 1 DDH (205')	Palmerston 5
Frontenac	South Canonto	J.C. Honsberger (15 Meadowacres Dr., Agincourt)	Uranium	1969 - Plugger sampling	South Canonto 4
Frontenac	South Canonto	Bordun Mining Corp. Ltd.	Uranium	1969 - Plugger sampling	South Canonto 5
Frontenac	South Canonto	Bordun Mining Corp. Ltd.	Uranium	1969 - Spectrometer survey	South Canonto 6
Frontenac	South Canonto	Bordun Mining Corp. Ltd.	Uranium Rare earths	1970 - Property report	South Canonto 7
Haliburton	Cardiff	CAM Mines Ltd.		1969 - 1 DDH (247')	Cardiff 90
Haliburton	Cardiff	International Mine Services Ltd.	Uranium	1969 - 1 DDH (354')	Cardiff 91
Haliburton	Cardiff	International Mine Services Ltd.	Uranium	1969 - Geological survey Scintillometer survey	Cardiff 92
Haliburton	Cardiff	Mid-North Engineering Service Ltd.	Uranium	1970 - 2 DDH (502')	Cardiff 93
Haliburton	Cardiff	Peter Simonds (2682 Flannery Dr., Ottawa 8)	Uranium	1970 - Stripping	Cardiff 94
Haliburton	Cardiff	J.R. Wilson (7 Lockwood Rd., Toronto 8)		1970 - Trenching & stripping	Cardiff 95
Haliburton	Cardiff	H.K. Hesselmann (732 Detroit Court, Lincoln Park, Michigan 48146, U.S.A.)		1970 - Pitting	Cardiff 96
Haliburton	Cardiff	G.H. Denfield (Wilberforce) (Stratmat Ltd.)	Uranium	1955 - 1 DDH (240')	Cardiff 97*
Haliburton	Cardiff	G.H. Denfield (Stratmat Ltd.)	Uranium	1955 - 1 DDH (41')	Cardiff 98*
Haliburton	Cardiff	A.H. Sovereign (366 Bay St., Toronto 1) (Stratmat Ltd.)	Uranium	1955 - 4 DDH (125)	Cardiff 99*
Haliburton	Cardiff	Stratmat Ltd.	Uranium	1955 - 1 DDH (40')	Cardiff 100*
Haliburton	Cardiff	Elmridge Mines Ltd.	Uranium	1956 - 4 DDH (1401')	Cardiff 101*
Haliburton	Cardiff	S.G. Farrar (217 Bay St., Toronto) (Mindus Corporation Ltd.)	Uranium	1955 - 2 DDH (165') Trenching	Cardiff 102*
Haliburton	Cardiff	S.G. Farrar (Box 33, Lorne Park) (Mindus Corporation Ltd.)	Uranium	1956 - 2 DDH (601')	Cardiff 103*
Haliburton	Cardiff	Mina - Nova Mines Ltd.	Uranium	1958 - Trenching	Cardiff 104*
Haliburton	Cardiff	Gamma-Ray Surveys Ltd.	Uranium	1956 - 3 DDH (166')	Cardiff 105*
Haliburton	Cardiff	C.G. Paton (403 - 25 Adelaide St. W., Toronto) (Red Bark Mines Ltd.)	Uranium	1955 - 4 DDH (1009')	Cardiff 106*

County	Township	Ownership (Optionee)	Commodity Sought	Assessment Work	File No.
Haliburton	Cardiff	W.S. Robertson (25 King St. W., Toronto 1) (Climax Molybdenum Co.)	Uranium	1955 - 3 DDH (621')	Cardiff 107*
Haliburton	Glamorgan	D.J. Holmes (Albert St., Lakefield)		1970 - Trenching	Glamorgan 4
Haliburton	Harcourt	Dean Carlson (43 Thorncliffe Park Dr., Toronto) (Jet Uranium Ltd.)	Uranium	1969 - 8 DDH (2207')	Harcourt 7
Haliburton	Monmouth	A.E. Tyson (47 Elmdale Court, Richmond Hill) (Milmount Exploration Ltd.)	Uranium	1969 - Spectrometer survey	Monmouth 20
Haliburton	Monmouth	Canuc Mines Ltd.	Uranium	1970 - 3 DDH (2392')	Monmouth 22
Haliburton	Monmouth	Silanco Mining and Refining Co. Ltd.	Uranium	1955 - 6 DDH (506')	Monmouth 23*
Hastings	Dungannon	Urban Quebec Mines Ltd.		1969 - 2 DDH (209')	Dungannon 11
Hastings	Dungannon	CAM Mines Ltd.	Uranium	1968 - 3 DDH (592') Trenching	Dungannon 12
Hastings	Elzevir	T.F. Madden (Apt. 18, 707 Dundas St. W., Whitby)	Copper, nickel	1969 - 3 DDH (243')	Elzevir 3
Hastings	Elzevir	T.F. Madden	Copper, nickel	1970 - 1 DDH (100') Trenching	Elzevir 4
Hastings	Elzevir	T.F. Madden	Copper, nickel, zinc, gold, silver	1968-70 - Sampling	Elzevir 5
Hastings	Faraday	Faraday Uranium Mines Ltd.	Uranium	1953-54 - 7 DDH (1657')	Faraday 9*
Hastings	Faraday	Sam Taylor (1024 - 85 Richmond St. W., Toronto 1) (Red Bark Mines Ltd.)		1955 - 1 DDH (326')	Faraday 10*
Hastings	Faraday	A.C. Williams (R.R.#1, Bonarlaw) (Trent River Iron Ltd.)	Iron	1954 - Magnetometer survey	Faraday 11*
Hastings	Faraday	Torny Financial Corp. Ltd.	Iron	1955 - Geological survey	Faraday 12*
Hastings	Faraday	Goldhawk Porcupine Mines Ltd.	Uranium	1955 - Geological survey Scintillometer survey	Faraday 13*
Hastings	Faraday	Goldhawk Porcupine Mines Ltd.	Uranium	1955 - 1 DDH (400')	Faraday 14*
Hastings	Faraday	Goldhawk Porcupine Mines Ltd.	Uranium	1955 - 3 DDH (1306')	Faraday 15*
Hastings	Faraday	Goldhawk Porcupine Mines Ltd.	Uranium	1955 - 1 DDH (161.5')	Faraday 16*
Hastings	Faraday	Pacemaker Mines and Oils Ltd.	Uranium	1955 - 3 DDH (2047')	Faraday 17*
Hastings	Faraday	Silver Crater Mines Ltd.	Uranium	1955 - 1 DDH (150')	Faraday 18*
Hastings	Faraday	Robert Campbell (330 Bay St., Toronto) (Silver Crater Mines Ltd.)	Uranium	1956 - 10 DDH (3214') Trenching	Faraday 19*
Hastings	Faraday	Goldhawk Porcupine Mines Ltd.	Uranium	1955 - 1 DDH (165')	Faraday 20*
Hastings	Faraday	Fidelity Mining Investments Ltd.	Uranium	1970 - Magnetometer survey	Faraday 29
Hastings	Faraday	Maclan Exploration Ltd.	Uranium, copper	1970 - 2 DDH (1025')	Faraday 30
Hastings	Faraday	J.R. Wilson (7 Lockwood Rd., Toronto 8)		1970 - Trenching & stripping	Faraday 31
Hastings	Faraday	Tanda Ltd.	Iron	1969 - Geological survey Magnetometer survey	Wollaston 4
Hastings	Grimsthorpe	T.F. Madden (Apt. 18, 707 Dundas St. W., Whitby)	Copper, nickel, zinc, gold, silver	1968-70 - Sampling	Elzevir 5
Hastings	Lake	Syngenore Explorations Ltd.	Copper	1969 - Geological survey Magnetometer survey EM survey	Lake 7
Hastings	Lake	Syngenore Explorations Ltd.	Copper	1970 - 3 DDH (1650')	Lake 8
Hastings	Limerick	Syngenore Explorations Ltd.	Nickel, copper	1969 - 5 DDH (1878')	Limerick 4
Hastings	Limerick	Macassa Gold Mines Ltd.	Copper, nickel	1970 - Magnetometer survey	Limerick 5
Hastings	Madoc	Earl Sager (Madoc)	Copper, nickel	1970 - 1 DDH (150')	Madoc 14

County	Township	Ownership (Optionee)	Commodity Sought	Assessment Work	File No.
Hastings	Madoc	Earl Sager	Copper, nickel	1970 - DDH (75' extension)	Madoc 15
Hastings	Madoc	W.A. Beninger (916 Elmdale Cr., Peterborough)	Copper, zinc	1970 - 1 DDH (204')	Marmora 6
Hastings	Monteagle	S.H. Law (7 Brule Terrace, Toronto) (McKenzie Red Lake Gold Mines Ltd.)	Graphite	1952 - 12 DDH (999')	Monteagle 4*
Hastings	Monteagle	B.C. Robson (Box 78, Lakefield, Ontario)	Uranium	1957 - 2 DDH (310')	Monteagle 5*
Hastings	Monteagle	T.E. Barton (205 Park Hill Rd. W., Peterborough)	Uranium	1969 - 7 DDH (282')	Monteagle 6
Hastings	Monteagle	L.G. Hobbs (65 Westwood Lane, Thornhill) (Union Mining Corp.)	Uranium	1969 - Trenching	Monteagle 7
Hastings	Monteagle	L.G. Hobbs (Union Mining Corp.)	Uranium	1969 - Bulk Sampling	Monteagle 8
Hastings	Tudor	W.H. Musselwhite (8 Queensgrove Rd., Scarborough 714)	Copper, nickel	1966 - 1 DDH (102.5')	Tudor 7
Hastings	Tudor	H.K. Hesselmann (732 Detroit Court, Lincoln Park, Michigan 48146, U.S.A.)		1970 - Pitting	Tudor 8
Hastings	Wollaston	Tanda Ltd.	Iron	1969 - Geological survey Magnetometer survey	Wollaston 4
Hastings	Wollaston	A.H. Clark, Sr. (P.O. Box 396, Bancroft)	Copper	1970 - Magnetometer survey EM survey	Wollaston 5
Hastings	Wollaston	Syngenore Explorations Ltd.	Copper	1969 - Geological survey Magnetometer survey EM survey	Lake 7
Lanark	Lavant	Carndesson Mines Ltd.	Mercury, copper silver, antimony	1969-70 - 24 DDH (5347')	Lavant 9
Nipissing	Murchison	T.J. Hamilton (Madawaska, Ontario)	Uranium	1969 - Trenching	Murchison 1
Nipissing	Murchison	T.J. Hamilton	Uranium	1969 - 2 DDH (78')	Murchison 2
Nipissing	West Ferris	W.H. Nichol (Nipissing Junction, Ontario)		1969 - 1 DDH (180')	West Ferris 1*
Parry Sound	Ferrie	E.T. Jones (R.R.#1, Callander)		1969 - Trenching	Ferrie 1
Parry Sound	Joly	Archie Haggerty (R.R.#3, Bancroft)	Copper, nickel	1970 - 2 DDH (100') Pitting	Joly 1
Parry Sound	Spence	G.W.R. Goodyear (100 Rowena Ave., Apt. 523, Toronto) (Metals, Petroleum and Hydraulic Resources Consulting Ltd.)	Copper, nickel	1970 - Magnetometer survey EM survey	Spence 1
Peterborough	Anstruther	H.E. Martin (St. 600 - 250 University Ave. Toronto 1) (Aubelle Mines Ltd.)	Uranium	1955 - 4 DDH (1774')	Anstruther 29*
Peterborough	Anstruther	H.E. Martin (Avillabona Mines Ltd.)	Uranium	1955 - 8 DDH (3310')	Anstruther 30*
Peterborough	Anstruther	A.L. Jones (8 Belton Rd., Don Mills) M.R. (Anstruther Rare Metals Co. Ltd.)	Uranium	1956 - 3 DDH (2026')	Anstruther 31*
Peterborough	Anstruther	Garland Mining and Development Co. Ltd.	Uranium	1956 - Property report 12 DDH (1992') Trenching	Anstruther 32*
Peterborough	Anstruther	Higgins Uranium Mines Ltd.	Uranium	1955 - 9 DDH (2138')	Anstruther 33*
Peterborough	Anstruther	Gray Wolf Exploration Co. Ltd.	Uranium	1956 - 8 DDH (693') Trenching	Anstruther 34*
Peterborough	Anstruther	Nathan Allen (20 East Cedar St., Chicago, Ill. USA) (A.L. Kemp, 26 Webb Ave. Toronto 9)	Uranium	1957 - 5 DDH (1282') Trenching	Anstruther 35*
Peterborough	Belmont	D.J. Holmes (Albert St., Lakefield)		1970 - Trenching & stripping	Belmont 12

County	Township	Ownership (Optionee)	Commodity Sought	Assessment Work	File No.
Peterborough	Burleigh	R.A. Hill (106 Princess Margaret Blvd., Islington) (L.V. Lomas Chemical Co. Ltd.)	White marble	1970 - 3 DDH (230')	Burleigh 14
Peterborough	Cavendish	Cavendish Uranium and Mining Co. Ltd.	Uranium	1954 - 16 DDH (4594')	Cavendish 36*
Peterborough	Cavendish	K.A. Weldon (512 Homewood Ave., Peterborough) (Kelbee Rare Metals Corp. Ltd.)	Uranium	1956 - 4 DDH (1034')	Cavendish 37*
Peterborough	Cavendish	Cavendish Uranium and Mining Co. Ltd.	Uranium	1954 - 12 DDH (4252')	Cavendish 38*
Peterborough	Cavendish	Drude Uranium Mines Ltd.	Uranium	1955 - 2 DDH (683')	Cavendish 39*
Peterborough	Cavendish	Calvin Comer (Pefferlaw, Ontario) (Alvin Godfrey, Pefferlaw)		1955 - 1 DDH (38') Trenching	Cavendish 40*
Peterborough	Cavendish	T.C. Michie (38 Maxwell Ave., Toronto 7) (Cardicore Uranium Corp.)	Uranium	1955 - 1 DDH (207') Trenching	Cavendish 41*
Peterborough	Cavendish	L.G. Sowten (129 Humbercrest Blvd., Toronto) (Cromwell Uranium and Development Co. Ltd.)	Uranium	1955 - 14 DDH (3695')	Cavendish 42*
Peterborough	Cavendish	R.W. Drude (18657 Audette, Dearborn, Mich., U.S.A) (Drude Uranium Mines Ltd.	Uranium	1955 - 3 DDH (1445')	Cavendish 43*
Peterborough	Cavendish	R.W. Drude (Drude Uranium Mines Ltd.)	Uranium	1955 - 2 DDH (1079')	Cavendish 44*
Peterborough	Cavendish	H.G. Greene (835 Nicholls St., Peterborough) (Louvicourt Goldfield Corp.)	Uranium	1969 - 6 DDH (1192')	Cavendish 45
Peterborough	Cavendish	H.G. Greene (Louvicourt Goldfield Corp.)	Uranium	1969 - Scintillometer survey Magnetometer survey	Cavendish 46
Peterborough	Cavendish	R.W. Drude (Drude Uranium Mines Ltd.)	Uranium	1956 - 2 DDH (100')	Cavendish 47*
Peterborough	Cavendish	Drude Uranium Mines Ltd.	Uranium	1956 - 2 DDH (100')	Cavendish 48*
Peterborough	Galway	G.C. Stevens (250 University Ave., Toronto) (Swiss Oils of Canada (1959) Ltd.)	Uranium	1970 - 2 DDH (287')	Galway 9
Peterborough	Methuen	W.A. Brown (Trent River) G.H. White (R.R.#3, Stirling)	Iron, titanium	1969 - 2 DDH (294')	Methuen 5
Peterborough	Methuen	Indusmin Ltd.		1970 - 2 DDH (253')	Methuen 6
Renfrew	Blithfield	Nickolas Axiotis (1451 Niles-Cortland Rd. NE, Warren, Ohio, U.S.A.)		1969 - Trenching	Blithfield 2
Renfrew	Blithfield	Nickolas Axiotis		1970 - Trenching	Blithfield 3
Renfrew	Blithfield	Nickolas Axiotis		1969 - Trenching	Blithfield 4
Renfrew	Raglan	Stewart Henderson (Box 601, Bancroft)		1969 - Trenching, pitting	Raglan 13

* Reports of previously submitted work, added to Resident Geologist's files during 1970.

Table 22 Other reports received in 1970

County	Township	Ownership	Commodity Sought	Type of Work	File No.
Frontenac	Barrie	Bey Mines Ltd.	Gold, silver, lead, zinc	1939 - Subsurface plans & assays	Barrie 18
Frontenac	Bedford	Megaton Mines Ltd.	Lead, zinc	1970 - Property report	Bedford 3
Frontenac	Olden	Solar Explorations Ltd.	Uranium	1970 - Prospectus	Olden 10
Frontenac	South Canonto	Carndesson Mines Ltd.	Mercury, copper, silver, antimony	1969 - Property report Prospectus	Lavant 8
Haliburton	Glamorgan Monmouth	Sylvanite Gold Mines Ltd.	Nepheline syenite	1942 - Geological Map	Monmouth 21
Hastings	Faraday	Geological Survey of Canada	Uranium	1968 - Paper on airborne gamma-ray spectrometer test survey	Faraday 28
Hastings	Tudor	Great Indian Explorations Ltd.	Lead, zinc, silver	1970 - Property report Prospectus	Tudor 9
Lambton	Warwick	New United Salt Mines Ltd.	Salt	1969 - Property report Prospectus	Warwick 1
Lambton	Warwick	New United Salt Mines Ltd.	Salt	1970 - Prospectus	Warwick 2
Lanark	Lavant	Carndesson Mines Ltd.	Mercury, copper, silver, antimony	1969 - Property report Prospectus	Lavant 8
Renfrew	Griffith	North American Molybdenum Corp. (former Spain Mine)	Molybdenum	1940 - Property report	Griffith 2

MP43 Summary of field work, 1970; by the Geological Branch, edited by E.G. Pye.

Coloured Geological Maps

Map 2173 Glamorgan Township, Haliburton County; by H.S. Armstrong and J. Gittins. Scale 1 inch to 1/2 mile.

Map 2174 Monmouth Township, Haliburton County; by H.S. Armstrong and J. Gittins. Scale 1 inch to 1/2 mile.

Preliminary Maps

P.244 (revised) - Thornhill area, York County, Pleistocene geology; by P.F. Karrow.

P.452 (revised) - Aeromagnetic maps of carbonatite-alkalic complexes in Ontario; compiled by J. Satterly.

P.574 Thornhill area, York County, Bedrock Topography Series; by P.F. Karrow.

P.582 Pleistocene geology of the Brantford area (west half); by W.R. Cowan.

P.603 Cardiff Township, Haliburton County, Data Series; compiled by S. Gibson.

P.605 Cavendish Township, Peterborough County, Data Series; compiled by S. Gibson.

P.606 St. Thomas area (east half), Pleistocene geology; by A. Dreimanis.

P.607 Anstruther Township, Peterborough County, Data Series; compiled by S. Gibson.

P.608 Faraday Township, Hastings County, Data Series; compiled by S. Gibson.

Open File Reports

No. 5045 Geology of the North Bay area; by S.B. Lumbers.

No. 5048 Pleistocene geology of the Brantford area; by W.R. Cowan.

Other Publications

Vol. 78 Annual report for the year 1968, report on mining operations in Ontario; compiled by G.S. Riddell.

Vol. 1 Annual statistical report for the year 1968, mineral production of Ontario; compiled by E.E. Matten.

1969 Review Annual review of the Ontario Department of Mines.

MLP3 Index of township and area claim maps in Ontario, 1970; compiled by Mining Lands Branch.

Map 2190 All that glisters; new edition of the popular brochure showing the geology and principal mineral deposits of Ontario.

1970 Publications, Geological Survey of Canada

Paper 69-45 A catalogue of Canadian minerals; by R.J. Traill.

Paper 70-1 Part A - Report of activities, April to October 1969; compiled by R.G. Blackadar.

Paper 70-1 Part B - Report of activities, November 1969 to March 1970; compiled by R.G. Blackadar.

Paper 70-4 Abstracts of publications in scientific journals by officers of the Geological Survey of Canada, April 1969 to March 1970.

Map 1194A Bruce Peninsula area (Geology); by B.A. Liberty and T.E. Bolton.

Map 1251A Tectonic map of Canada; compiled by C.H. Stockwell et al. (published 1969).

Map 1254A Physiographic regions of Canada; compiled by H.S. Bostock.

Map 1256A Isotopic age map of Canada; compiled by C.H. Stockwell et al.

Map 1257A Retreat of Wisconsin and Recent ice in North America; by V.K. Prest (published 1969).

Map 1264A Blackburn, Ontario-Quebec, geomorphology; compiled by J. LeMenestrel (published 1969).

Map 7059G Tobermory, Ontario, Aeromagnetic Map, scale 1 inch to 4 miles (published 1969).

Map 7334G Toronto, Ontario, Aeromagnetic Map, scale 1 inch to 4 miles.

Map 7335G Kitchener, Ontario, Aeromagnetic Map, scale 1 inch to 4 miles.

Map 7341G Bruce, Ontario, Aeromagnetic Map, scale 1 inch to 4 miles.

Maps 8380G to 8413G inclusive - Aeromagnetic Maps, scale 1 inch to 1 mile, over part of the Paleozoic belt of Southern Ontario.

SUDBURY DISTRICT

By

D.G. Innes

CONTENTS

Sudbury District

Tables

Figures

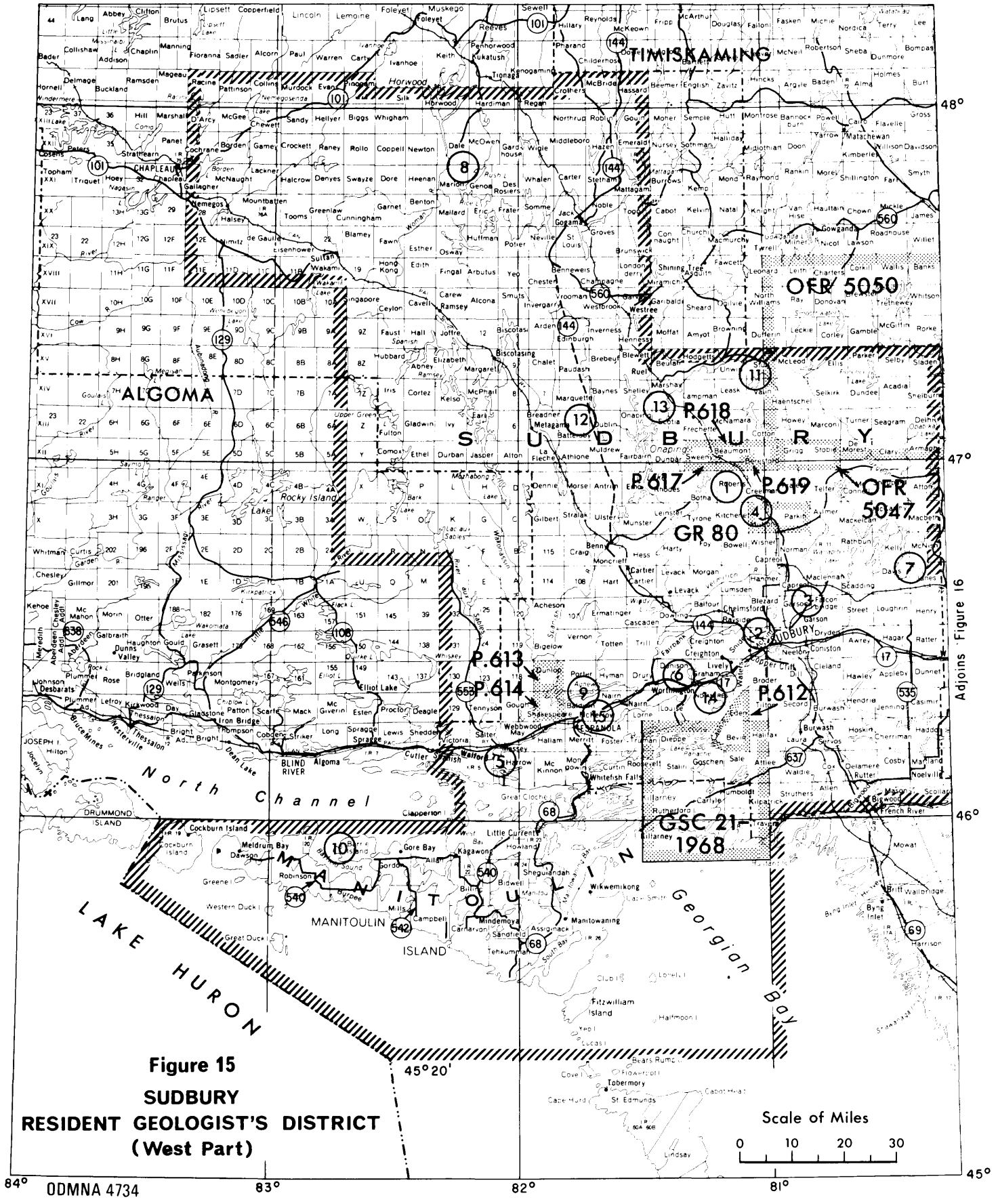


Figure 15

SUDBURY
RESIDENT GEOLOGIST'S DISTRICT
(West Part)

ODMNA 4734

INDEX TO FIGURES 15 & 16

1. Nordic Mines and Investments Limited Property
2. The International Nickel Company of Canada Limited
3. Falconbridge Nickel Mines Limited
4. National Steel Corp. of Canada Limited
5. Hermina Mine
6. Kidd Copper Mine
7. Davis, Kelly and Janes Area
8. Rush Lake Area
9. Agnew Lake Area
10. Union Carbide Canada Mining Limited
11. Stull Township
12. Battersby and Dublin Townships
13. Marshay Township
14. Whitefish Lake Indian Reserve
15. Spanish River Mines Limited

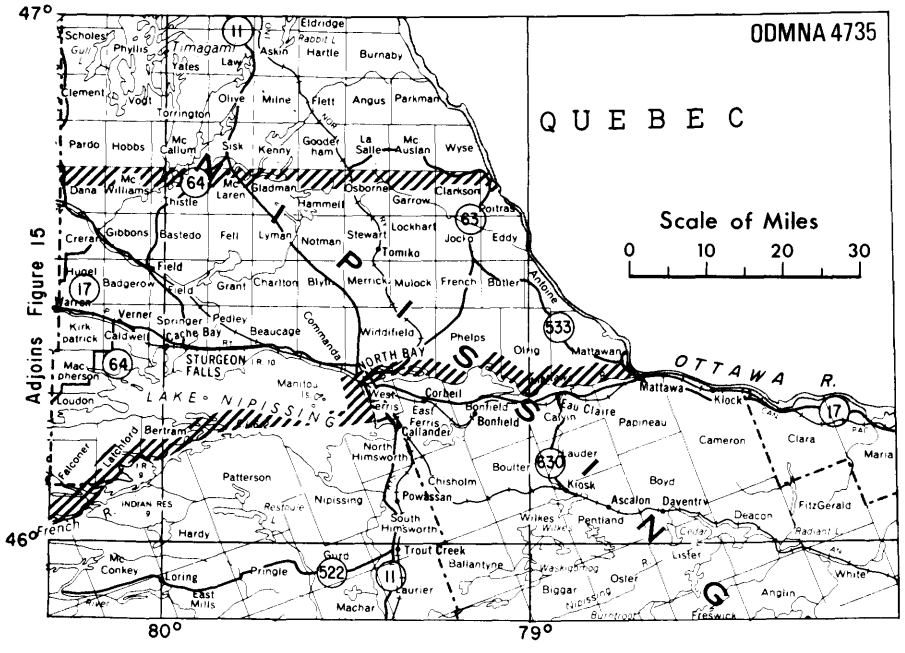


Figure 16

SUDBURY RESIDENT GEOLOGIST'S DISTRICT

(East Part)

EXPLANATION

(3) Location mentioned in text

Boundary of Resident Geologist's District

P.617 New maps and(or) reports (with number)
- GR - Geological Report
- OFR - Open File Report
- P - Preliminary Map
- GSC - Geological Compilation Series

SUDBURY DISTRICT

By

D.G. Innes[1]

INTRODUCTION

Sudbury staff of the Geological Branch during 1970 included the following persons: K.D. Card (field geologist), D.G. Innes (Resident Geologist's assistant), L. Joliat (summer assistant), J. Carriere (geologist's assistant), and Mrs. Y.M. Paquette (secretary). Miss Joliat returned to Laurentian University in September of 1970. Mrs. Carriere, a graduate of Laurentian University, commenced her work as assistant to Dr. Card in September 1970.

Field trips and conventions attended by staff members included the annual Prospectors and Developers Convention in Toronto, and a field trip for the Department's geological staff in the Red Lake-English River area. Several field trips in the Sudbury and Espanola areas for visiting geologists and university students were conducted by Card and Innes.

Card also participated on committees planning for the Geological Association of Canada-Mineralogical Association of Canada Convention to be held in Sudbury in 1971, and for the International Geological Congress field trips in the Sudbury area in 1972. Card attended the Geological Survey of Canada workshop conference on basins and geosynclines and represented the Minister at a meeting of the Ontario Council of Conservation Authorities held in the summer of 1970.

During the 1970 field season, mapping of Eden Township, and parts of Bevin and Caen Townships, and Dunlop and Shakespeare Townships was completed by Card, P. Palonen and assistants.

Mapping of Sweeny, Beaumont, and Beresford Townships was completed by H.D. Meyn and assistants.

A geological guide book describing the geology and scenery between Sault Ste. Marie and Sudbury is being prepared by J.A. Robertson and Card. The guide book is nearing completion and is scheduled for publication in 1972.

During 1970, Card, Meyn, Robertson, Innes, and T. Bottrill visited the Nordic Mines Investments Ltd. property (Location 1 on Figure 15) in Roberts Township.

MINING AND EXPLORATION ACTIVITY

Exploration activity was high during 1970 and according to the Office of the Mining Recorder, Sudbury, there were 3,763 claims recorded in 1970 as

---

[1]Resident Geologist's Assistant, 1349 LaSalle Blvd., Sudbury.
Manuscript accepted for publication February 17, 1971.

compared with 3,312 claims in 1969. Information for assessment credit, including geological and geophysical surveys, and diamond drill logs, was submitted to the Resident Geologist's office by companies and individuals working in 71 different townships. This information is summarized in the table of Assessment Work filed in 1970 (Table 23).

The International Nickel Company of Canada Limited (Location 2 on Figure 15), the major producer of the district, currently operates 12 mines for the production of nickel, copper, and other metals.

Falconbridge Nickel Mines Ltd. (Location 3 on Figure 15) operated eight mines in the Sudbury District during 1970. No new mines were brought into production, but four properties are in various stages of exploration and development. No. 2 Shaft of the Lockerby Mine was collared and preparations are underway for sinking in 1971. No. 1 Shaft reached the 3,825-foot level, and the mill site has been cleared. Shafts have been collared at the Lindsley, Fraser, and Onex properties, with sinking operations scheduled for 1971. Start-up of the new $35,000,000 nickel-iron refinery at Falconbridge was achieved late in the year. The plant is designed to process 500,000 tons of pyrrhotite concentrate annually, producing 300,000 tons of a new iron-nickel product in pellet form which is directly chargeable to steel-making furnaces.

The National Steel Corporation of Canada Ltd. (Location 4 on Figure 15) produced 656,000 tons of iron ore pellets during 1970. Production continued at the Hermina Mine (Location 5 on Figure 15) near Massey, and at the Spanish River Mines Ltd. property (Location 15 on Figure 15) in Baldwin Township, the ore being treated at the Pronto Mill in Spragge. Production continued also at the Kidd Copper Mine (Location 6 on Figure 15) a former nickel-copper producer in Denison Township.

Copper-nickel exploration was actively carried out in the Sudbury District by many companies in 1970. Kennco Explorations Ltd. and Mid-North Engineering Services Ltd. continued their investigation of diabase bodies with widespread low-grade copper, nickel mineralization in Davis, Kelly, and Janes Townships (Location 7 on Figure 15).

Disseminated copper mineralization occuring in and around a porphyritic phase of a granite stock in the Rush Lake area (Location 8 on Figure 15) is being investigated by Northwest Canalask Nickel Mines Ltd., Quadroyal Mining Company Ltd., and Marquis Explorations Ltd. Diamond drilling and geophysical surveys indicate the possibility of a porphyry copper type deposit.

Uranium-bearing laminated "argillite" in Roberts and Beaumont Townships was investigated for uranium mineralization by PCE Explorations Ltd., Murgor Explorations Ltd., Copperville Mining Corporation Ltd., M. Watts and G. Leliever during 1970. Broulan Reef Mines Ltd., C. Springer, Delcan Minerals Ltd., and Ruim Explorations Ltd. continued exploration for uranium and base metals in the Agnew Lake area (Location 9 on Figure 15).

Table 23 Assessment and other reports received in 1970

Abbreviations

GL	Geological survey	SP	Self Potential survey	DDH	Diamond drill hole log
GP	Geophysical survey	MAG	Magnetometer survey	5DDH	(1230') 5 diamond drill hole logs for 1,230 feet
EM	Electromagnetic survey	RA	Radiometric survey		

rept.	Report		
Tr.	Trenching		
St.	Stripping		

Symbols

Au	Gold						
Cb	Columbium	Cu	Copper	Ky	Kyanite	U	Uranium
Co	Cobalt	F	Fluorite	Ni	Nickel	Zn	Zinc
				S	Sulphides		

Date received means the date on which the file was received at the Sudbury office.

Township or Area	Ownership	Date Received	Nature of Work	No. of Claims	Commodity Sought
Antoine	Cononaco Mines Ltd.	Oct. 15/70	Tr: (Cobra Drill)	4	
Baldwin	Ruim Exploration Ltd.	July 3/70	Plugger work; Tr	2	U
	Springer, Conrad	Mar. 31/70	3 DDH (727')	1	U
	Springer, Conrad	May 27/70	Manual labour; location map	1	U
	Stump Mines	Dec. 28/70	Prospectus	12	S
Barrie Island	Ont. Dept. Mines	Sept. 10/70	Exploratory licence; Info to be held confidential for 1 yr.)		
Benneweiss	Broken Hill Explorations Ltd.	Nov. 12/70	Prospectus; GL rept.; Plan of claims	12	Cu
	Safari Explorations Ltd.	Dec. 28/70	GL: survey & map; claim & location survey map; prospectus	9	Cu
Beaumont	Murgor Explorations Ltd.	Feb. 17/70	GL: survey; GP: survey (RA)	35	U
	Murgor Explorations Ltd.	May 22/70	GL: survey & map; GP: Gamma ray survey & map	35	U
Broder	Rainville, Robert	June 5/70	Tr; St	1	
Butler	MacWilliam, Morris J.	Apr. 20/70	Manual labour	3	
Chester	Cravit, H.	Mar. 3/70	GP: EM ground work	15	Au, Cu
	Cravit, H.	May 22/70	GP: EM survey & map; GL: survey	15	Au, Cu
	Darwin Mines Ltd.	Sept. 29/70	Prospectus	10	Au, Cu
	Gogama Minerals Ltd.	Sept. 29/70	Prospectus; GL: rept.; Summary Rept.; Property location map . Assays	15	Au, Cu, Ag
Chester	Kingbridge Mines Ltd.	Sept. 29/70	Prospectus; Amendment to prospectus; Exploration Programme; claims location map	19	Au, Cu
	Lava Minerals Ltd.	Sept. 29/70	Prospectus; GL: rept.; location plan; GL: plan; claim group	20	Au, Cu
	Three Duck Gold Mines Ltd.	Feb. 9/70	GP: EM rept. & maps	4	Au, Cu
Chewett	Dominion Gulf Co. (Transferred from Kirkland Lake)	May 6/70	GL: rept. & map; 29 DDH (14,844')		
Clarkson	Haberer, Joseph	Oct. 15/70	Drilling & blasting	1	
Coppell	Talisman Mines Ltd.	Sept. 29/70	Amendment to prospectus		
Craig	Almore Explorations Ltd.	Dec. 28/70	Prospectus; claims location map; GL: rept. & GL: location map & legend	18	Au, Cu
Cunningham	Consolidated Shunsby Mines Ltd.	Jan. 9/70	GL: surveying	1	Cu, Pb, Zn
	Consolidated Shunsby Mines Ltd.	Jan. 22/70	Tr & blasting	4	Cu, Pb, Zn
	Consolidated Shunsby Mines Ltd.	Mar. 11/70	GL: survey & map	1	Cu, Zn, Pb
	Consolidated Shunsby Mines Ltd.	Sept. 25/70	GL: mapping & assay expenditures	6	Cu, Pb, Zn
	Consolidated Shunsby Mines Ltd.	Nov. 10/70	GL: rept. & map; group sketch; S: Cu,Pb,Zn	10	Cu,Pb,Zn
Dana	Patrie, J. P.	Jan. 9/70	Plugger work; St	4	
Davis	Christie, S.	Jan. 22/70	Mechanical equipment; 2 DDH (60')	1	
	Kennco Explorations Ltd.	Mar. 20/70	GP: EM & MAG rept. & maps	382	Fe

Township or Area	Ownership	Date Received	Nature of Work	No. of Claims	Commodity Sought
Davis & Janes	Mid-North Engineering Services Ltd.	Apr. 20/70	GP: MAG survey	25	Cu, Ni
	Mid-North Engineering Services Ltd.	May 7/70	Core specimens collected; GP: EM survey	5	Cu, Ni
	Mid-North Engineering Services Ltd.	May 15/70	8 DDH (1461'); locations	2	Cu, Ni
	Mid-North Engineering Services Ltd.	July 22/70	7 DDH (1334'); drill plan; S: Cu, Ni	2	Cu, Ni
	Mid-North Engineering Services Ltd.	Nov. 2/70	GP: MAG rept. & map; EM rept.	63	Cu, Ni
Denyes	Brown, Arthur	July 3/70	Tr, blasting, drilling	12	
Dryden	Bjelajac, Simo	July 3/70	Tr	1	
	Frank, Laura G.	May 21/70	GP: EM survey	3	
	West, Robert	May 21/70	GP: EM & MAG surveys	4	
Eddy & Poitras	Geauvreau, Douglas	Apr. 9/70	Tr; manual labour	1	
Falconbridge	Bjelajac, Simo	Sept. 25/70	Tr; location	1	
	Bjelajac, Simo	May 21/70	Tr	1	
	Frank, Wilbur B.	May 21/70	GP: EM & MAG surveys	6	
	Kingsland, L. R.	Mar. 31/70	GP: EM survey	6	
	Plese, Mike	June 5/70	Tr; manual labour	1	
	Robinson, Frank	Feb. 17/70	GP: EM, MAG surveys	5	
	Thorpe Bay Explorations Ltd.	Feb. 23/70	Prospectus; GL: rept. & map	32	S
	Thorpe Bay Explorations Ltd.	Oct. 15/70	GL: mapping; GP: work	17	S
Falconbridge	Tradewinds Exploration Ltd.	Sept. 30/70	GP: EM & MAG repts. & maps	5	S
	West, Gladys M.	May 21/70	GP: EM & MAG survey	3	S
Falconbridge & Dryden	Pershland Gold Mines	Sept. 30/70	GP: EM & MAG rept. & maps	6	S
Field	MacDonnell, A.	Jan. 8/70	GL: rept. & work	15	rare earths
Foy & Tyrone	Falconbridge Nickel Mines Ltd.	Jan. 23/70	3 DDH (2653')	2	S
Fraleck	Rivers, Ernest J.	Sept. 25/70	Manual labour; plugger work; location	1	
	Rivers, Ernest J.	May 27/70	Power equipment (plugger);manual labour	1	
Genoa & Eric	Marquis Exploration Ltd.	Sept. 29/70	Prospectus; GL: rept.; key map; claims group map; location map	12	Cu
Grigg & Stobie	Canadian Johns-Manville Co. Ltd.	Feb. 10/70	GL: traverses	86	U
Graham	Falconbridge Nickel Mines Ltd.	Jan. 8/70	GL: rept. & map	2	Cu, Ni
	Falconbridge Nickel Mines Ltd.	Jan. 28/70	GP: survey	2	Cu, Ni
	Falconbridge Nickel Mines Ltd.	Mar. 9/70	GP: MAG & EM rept. & maps	2	Cu, Ni
	Falconbridge Nickel Mines Ltd.	Apr. 9/70	GP: MAG survey	18	Cu, Ni
	Falconbridge Nickel Mines Ltd.	Oct. 8/70	GP: MAG & EM rept. & Maps	18	Cu, Ni
	International Nickel Co. of Canada Ltd., The	July 10/70	3 DDH (3013'); locations	5	Cu, Ni
	Palco Explorations Ltd.	May 20/70	8 DDH (1997'); locations	8	Cu, Ni
Hart	Lacelle, Aurele	Jan. 22/70	10 DDH (132')	1	
Hodgett's	A.G.N. Syndicate	Jan. 15/70	GP: EM & MAG survey & maps	5	Cu
	Metron Exploration Ltd.	Oct. 15/70	Airborne EM survey	18	
Hotham Island	Tough-Rock Quarries Ltd.	Dec. 18/70	GL: rept. on survey; GL: maps; 7 DDH(2784'	4	
Hutton	International Mine Services Ltd.	Jan. 8/70	3 DDH (4031')	2	U
Hutton & Creelman	Bohme, J. D. S.	Mar. 2/70	GL: rept. & map	29	U
Hyman	Camisso, Anthony	Mar. 4/70	GP: air RA & ground survey & maps	20	U
	Camisso, Anthony	July 31/70	GL: rept. & map; GP: MAG, spectrometer rept. & map	58	U
	Carmont Mines Ltd.	Mar. 31/70	GL: survey	19	U
	Richore Gold Mines Ltd.	Jan. 14/70	GP: RA spectrometer survey & map	11	U
	Richore Gold Mines Ltd.	June 5/70	GP: survey; GL: survey	20	U
	Richore Gold Mines Ltd.	Aug. 24/70	1 DDH (3502'); location; DD rept.; plugger work & map	7	U

Township or Area	Ownership	Date Received	Nature of Work	No. of Claims	Commodity Sought
Hyman & Nairn	Buchy, Harry	Mar. 31/70	St & Tr	5	
	Monteagle Minerals	Sept. 29/70	Prospectus		U
	Monteagle Minerals	Dec. 28/70	Prospectus		U
Janes	Carmont Mines Ltd.	Mar. 25/70	GL:survey	19	S
	Rivers, E. J.	Mar. 25/70	GP: Induced polarization ground survey	15	S
Janes	Rivers, E. J.	Sept. 25/70	GP: Induced polarization rept. & map; GL: map		S
	Rivers, E. J.	Oct. 15/70	7 DDH (6725')	5	S
Kelly	Kennco Explorations (Canada) Ltd.	May 7/70	Manual work; mechanical equipment & location trench	2	Cu, Ni
	Kennco Explorations (Canada) Ltd.	May 20/70	8 DDH (825'); locations	1	Cu, Ni
	Kennco Explorations (Canada) Ltd.	July 27/70	8 DDH (5353')	6	Cu, Ni
	Summit Explorations & Holdings Ltd.	Nov. 12/70	Prospectus; GL: rept. & GL claims map	6	Cu, Ni Pb,Zn,Au,Ag
MacLennan	Blanchard, Ed	Sept. 25/70	Manual & mechanical trenching; location	1	
	Kosciuszko, John	Apr. 20/70	Plugger work	1	
	Kosciuszko, John	June 25/70	Plugger work	1	
	Kosciuszko, John	July 20/70	Plugger work	1/	
	Kosciuszko, John	Aug. 13/70	Blasting; location	1	
Mallard	Bulldog Mines Ltd.	Dec. 28/70	GL: rept.; claims location map; prospectus	12	Cu
Marion	Northwest Canalask Nickel Mines Ltd.	Nov. 12/70	Prospectus; GL: rept.; GL: map showing holdings	18	Cu
	Parr Mines Ltd.	Dec. 28/70	Prospectus; GL: rept.; claims location map	49	Cu
	Wendmar Gold Mines Ltd.	Nov. 16/70	GP: geo-MAG rept. & map	18	Cu
Marion	Quadroyal Mining Co. Ltd.	Sept. 29/70	Prospectus		Cu
Moncrieff & Hess	Moncrieff Uranium Mines Ltd.	Sept. 29/70	GL: rept.	83	U
Mongowin	Jolloco Explorations Ltd.	Feb. 17/70	GP: EM, MAG, RA surveys; GL: survey	16	U
	Jolloco Explorations Ltd.	May 22/70	GP: EM, MAG & Scintillometer surveys & map; locations; GL: map & survey	23	U
	Jolloco Explorations Ltd.	Oct. 15/70	5 DDH (1480'); GL: map; location map	3	U
Morgan	International Nickel Co. of Canada Ltd., The	Apr. 17/70	1 DDH (401')	1	
	Lake Kozak Mines	Mar. 2/70	GP: MAG rept.		
	Lake Kozak Mines	Mar. 4/70	GP: MAG, EM surveys & maps	East ½ Lot 8, Conc.I	
Nairn	Alanen, Wm.	Feb. 19/70	Drilling, blasting, St & mucking	1	
	Cairnglen Explorations Ltd.	Jan. 21/70	GL: survey	17	Cu, Ni
	Cairnglen Explorations Ltd.	Apr. 27/70	GP: MAG, rept. & map; GL: rept. & map	17	Cu, Ni
	Grimsell, Stanley	Feb. 19/70	Drilling, blasting & mucking	1	
	Sadowski, John,	Jan. 22/70	GP: survey	20	
	Sadowski, John	Mar. 4/70	GP: survey (MAG & EM) & maps	20	
Neelon	MacIntyre, C.	Sept. 25/70	GP: MAG, ground work, EM work	6	
Norman	Tincombe, Richard	Apr. 27/70	4 DDH (632')	1	S
Parkin	Laframboise, George	Sept. 25/70	Plugger work; location	1	
	Miron, Theodore	June 25/70	Plugger work	1	
	Phelan, L. G.	July 10/70	1 DDH (2147'); location	2	

Township or Area	Ownership	Date Received	Nature of Work	No. of Claims	Commodity Sought
Porter & Shakespeare	Broulan Reef Mines Ltd.	Jan. 7/70	5 DDH (3275')	4	U
Porter & Vernon	Canadian Johns-Manville Co. Ltd.	Oct. 15/70	3 DDH (3627')	5	U
Rathbun	Mareast Explorations Ltd.	Oct. 9/70	GP: EM rept. & map	10	S
	Mid-North Engineering Services Ltd.	Apr. 9/70	GP: EM check survey	4	S
Rhodes	Blanchard, Ed	Mar. 31/70	Bulldozing; St	1	
	Richardson Lake, Iron Mines Ltd.	July 3/70	Bulldozing	2	
Roberts	Leliever, Gordon	Mar. 31/70	Shaft sinking	1	U
	Leliever, Gordon	July 3/70	Shaft sinking	1	U
	PCE Explorations Ltd.	Jan. 8/70	GP: RA survey; rept. & map	10	U
Roberts & Beaumont	Leliever, Gordon	Mar. 4/70	GL: survey & map; GP: MAG survey & map	16	S, U
Roberts & Kitchener	Copperville Mining Corp. Ltd.	Nov. 12/70	Prospectus	33	U
	Watts, Murray	Jan. 23/70	GL: Plan; RA survey	33	U
	Watts, Murray	Apr. 27/70	GL: rept. & map; GP: rept. & map	33	U
Robinson	Union Carbide Canada Mining Ltd.	Aug. 12/70	GP: location plan; ground MAG results; ground induced polarization results; 2 DDH (4512'); cross-section of D.D.H. logs		
Salter	Dagenais, Armand	Sept. 25/70	Manual labour; locations	2	
	Dagenais, Armand	Oct. 15/70	St & Tr		
Scadding	Laframboise, George	Aug. 13/70	2 DDH (532'); locations	2	S
	Lone, James H.	Jan. 22/70	1 DDH (400')	1	S
	Rivers, E. J.	Mar. 31/70	3 DDH (1297')	2	S
Shakespeare	Delcan Minerals Ltd.	June 5/70	Tr with gas plugger; location	1	U
	Delcan Minerals Ltd.	July 20/70	Tr with gas plugger	1	U
	Falconbridge Nickel Mines Ltd.	May 22/70	1 DDH (1200'); location	1	U
Shakespeare & Baldwin	Broulan Reef Mines Ltd.	July 10/70	1 DDH (2070'); core specimen; location	2	U
Stetham	Jonsmith Mines Ltd.	Jan. 13/70	Bulldozing	1	
Stull	Metron Explorations Ltd.	June 5/70	GL: survey; line cutting & induced polarization survey; V.L.F. survey (EM 16).	12	Cu
	Metron Explorations Ltd.	July 20/70	4 DDH (1981.5'); locations	67	Cu
Trill	Alanen, Wm.	Feb. 19/70	GP: MAG surveys	2	
	Alanen, Wm.	July 3/70	GP: EM surveys	3	
	Canadex Mining Corp. Ltd.	Feb. 23/70	Prospectus	8	Cu, Ni
	Grimsell, Stanley	Feb. 19/70	GP: MAG surveys	3	
	Grimsell, Stanley	July 3/70	GP: EM surveys	3	
	Plaskett, G. G.	Feb. 19/70	GP: MAG survey	5	
	Plaskett, G.G.	May 22/70	GP: MAG survey & map	6	
	Plaskett, G.G.	July 3/70	GP: EM surveys	5	
Trill	Rastall, D. E.	Feb. 19/70	GP: MAG survey	3	
	Rastall, D. E.	July 3/70	GP: EM surveys	3	
Valin	Chimo Gold Mines Ltd.	July 3/70	Plugger work; GP: work	5	Cu
	Chimo Gold Mines Ltd.	Dec. 8/70	GP: induced polarization survey rept. & map	5	Cu
Vernon	Canadian Johns-Manville Co. Ltd.	Sept. 25/70	GL: work & GP: work	7	U
129	Withers, Stanley, D.	Jan. 22/70	Hand drilling	1	

NEW INFORMATION

References to papers, geological reports, and maps containing information on the geology and known ore deposits of the Sudbury District are given in the appended tables.

Information reported in the press is added to a separate, unnumbered press-clippings file.

A summary of the new data received is presented in Table 24. For comparison, figures for the preceding year are also listed.

Table 24 Summary List of New Information Received

	1969	1970
Townships or areas represented	455	455
Geological Surveys	46	41
Geophysical Surveys	41	57
Reports of drilling	796	140
Total footage of reported drilling	299,482.7	73,895.5
Reports of stripping and trenching	19	34
Quarry permits	85	95

Diamond drilling by Union Carbide Canada Mining Ltd. (Location 10 on Figure 15) on the north side of Manitoulin Island cut 1,000 feet of Paleozoic rocks to a Precambrian basement of essentially granitic composition. Basement rocks and magnetics under the Paleozoic cover indicate the possibility of large intrusives of the Croker Island complex type.

Several occurrences of copper mineralization in Stull Township (Location 11 on Figure 15) in the Shining Tree area, reported early in 1970, warrant further investigation.

The discovery of a new greenstone belt in Battersby and Dublin Townships (Location 12 on Figure 15) is of potential economic interest. This belt possibly hooks up with the greenstone belt in Marshay Township (Location 13 on Figure 15) to the northeast. Occurrences of sphalerite have been known in Marshay Township for some time, and just recently copper, lead, and zinc finds have been reported in Dublin Township.

Work done by the Gravity Division of the Department of Energy, Mines and Resources, has indicated the presence of a broad positive gravity anomaly associated with the Sudbury structure and Grenville Front zone.

Minor amounts of niobium-bearing rutile and sphalerite occur in subvolcanic mafic alkaline intrusions (fenite breccias) in the Whitefish Lake Indian Reserve (Location 14 on Figure 15).

Highway 144, the new highway between Sudbury and Timmins, is now open and offers improved access to a large area.

NEW MAPS AND LITERATURE

Card, K.D., McIlwaine, W.H., and Meyn, H.D.
1970: Geology of the Maple Mountain area, Districts of Sudbury, Timiskaming, and Nipissing; Ontario Dept. Mines and Northern Affairs, Open File Rept. 5050.

Card, K.D., Palonen, P., and Siemiatkowska, K.
1970: Eden Township and parts of Bevin and Caen Townships, Louise-Eden area; Ontario Dept. Mines and Northern Affairs, Prelim. Geol. Map P.612, scale 1 inch to 1/4 mile. Geology 1970.

Card, K.D., Palonen, P., Siemiatkowska, K., and Masson, S.
1970a: Dunlop Township, District of Sudbury; Ontario Dept. Mines and Northern Affiars, Prelim. Geol. Map P.613, scale 1 inch to 1/4 mile. Geology 1970.
1970b: Shakespeare Township, District of Sudbury; Ontario Dept. Mines and Northern Affairs, Prelim. Geol. Map P.614, scale 1 inch to 1/4 mile. Geology 1970.

Chandler, F.W., Young, G.M., and Wood, J.
1969: Diaspore in Early Proterozoic quartzites (Lorrain Formation) of Ontario; Can. J. Earth Sci., Vol. 6, No. 2, p.337-346.

Church, W.R., and Young, G.M.
1970: Discussion of the progress rept. of the Federal Provincial Committee on Huronian Stratigraphy; Can. J. Earth Sci., Vol. 7, No. 3, p.912-918.

Clifford, P.M., Henderson, J.R., Hsu, M.Y., Kwak, T.A.P., and Spuven, H.R.
1970: The Grenville Front south of Sudbury, Ontario; Abstract of Paper, GAC-MAC Ann. Meeting, Winnipeg, Manitoba, Aug.-Sept. 1970.

Fox, J.S.
1970: Petrologic study of chloritoid and staurolite bearing rocks, Agnew Lake, Ontario; Unpub. M.Sc. Thesis, McGill University, Montreal, Quebec.

Frarey, M.J., and Cannon, R.T.
1969: Notes to accompany a map of the geology of the Proterozoic rocks of Lake Panache-Collins Inlet map-area of Ontario (41I/3, H/14); Geol. Surv. Canada, Paper 68-63, 5p. Accompanied by Map 21-1968, scale 1 inch to 2 miles.

French, B.M.
1969: Possible relations between meteorite impact and igneous petrogenesis as indicated by the Sudbury structure, Ontario, Canada; Goddard Space Flight Centre, Greenbelt, Maryland.

Krogh, T.E., and Davis, G.L.
1969: Old isotopic ages in the northwestern Grenville Province, Ontario; Geol. Assoc. Canada, Spec. Paper No. 5, p.189-192.

Meyn, H.D.
1970a: Geology of Hutton and Parkin Townships, District of Sudbury; Ontario Dept. Mines, GR80, 78p. Accompanied by Map 2180, scale 1 inch to 1/2 mile.
1970b: Geology of Grigg and Stobie Townships, District of Sudbury; Ontario Dept. Mines, Open File Rept. 5047.
1970c: Sweeny Township, District of Sudbury; Ontario Dept. Mines and Northern Affairs, Prelim. Geol. Map P.617, scale 1 inch to 1/4 mile. Geology 1970.
1970d: Beaumont Township, District of Sudbury; Ontario Dept. Mines and Northern Affairs, Prelim. Geol. Map P.618, scale 1 inch to 1/4 mile. Geology 1970.
1970e: Beresford Township, District of Sudbury; Ontario Dept. Mines and Northern Affairs, Prelim. Geol. Map P.619, scale 1 inch to 1/4 mile. Geology 1970.

Pye, E.G.
1970a: Current activities and trends in exploration in Ontario; Ontario Dept. Mines, MP37, 31p.
1970b: Summary of field work, 1970, by the Geological Branch; Ontario Dept. Mines, MP43, 96p.

Robertson, J.A., Card, K.D., and Frarey, M.J.
1969a: The Federal-Provincial Committee on Huronian Stratigraphy, Progress Rept.; Ontario Dept. Mines, MP31, 23p.
1969b: The Federal-Provincial Committee on Huronian Stratigraphy; Progress Rept.; Can. J. Earth Sci., Vol. 6, No. 2, p.335-336.

Stevenson, J.S., and Colgrove, G.L.
1968: The Sudbury Irruptive: some petrogenetic concepts based on recent field work; International Geol. Congress 23rd Session, Czechoslovakia, Rept., Oct. 4, p.27-35.

Souch, B.E., Podolsky, T., and the Geological Staff of The International Nickel Company of Canada Ltd.
1969: The sulfide ores of Sudbury; their particular relationship to a distinctive inclusion bearing facies of the nickel irruptive; Econ. Geology (in press).

Thomson, J.E.
1969: A discussion of Sudbury geology and sulphide deposits; Ontario Dept. Mines, MP30, 27p.

Young, G.M.
1970: An extrusive Early Proterozoic glaciation in North America?; Paleogeology, Paleoclimatology, Paleoecology, Vol. 6 (in press).

THUNDER BAY DISTRICT

By

C.R. Kustra

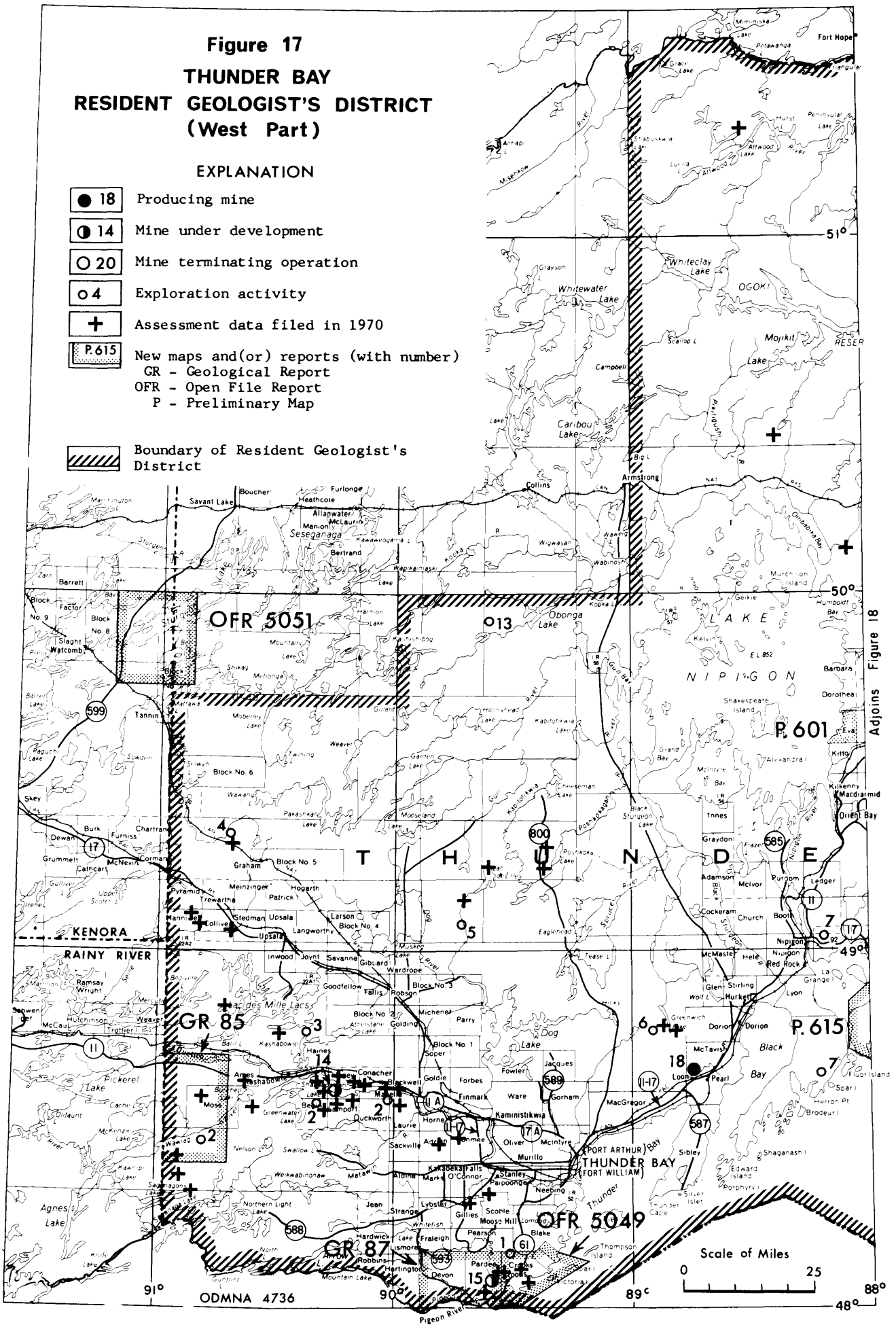
CONTENTS

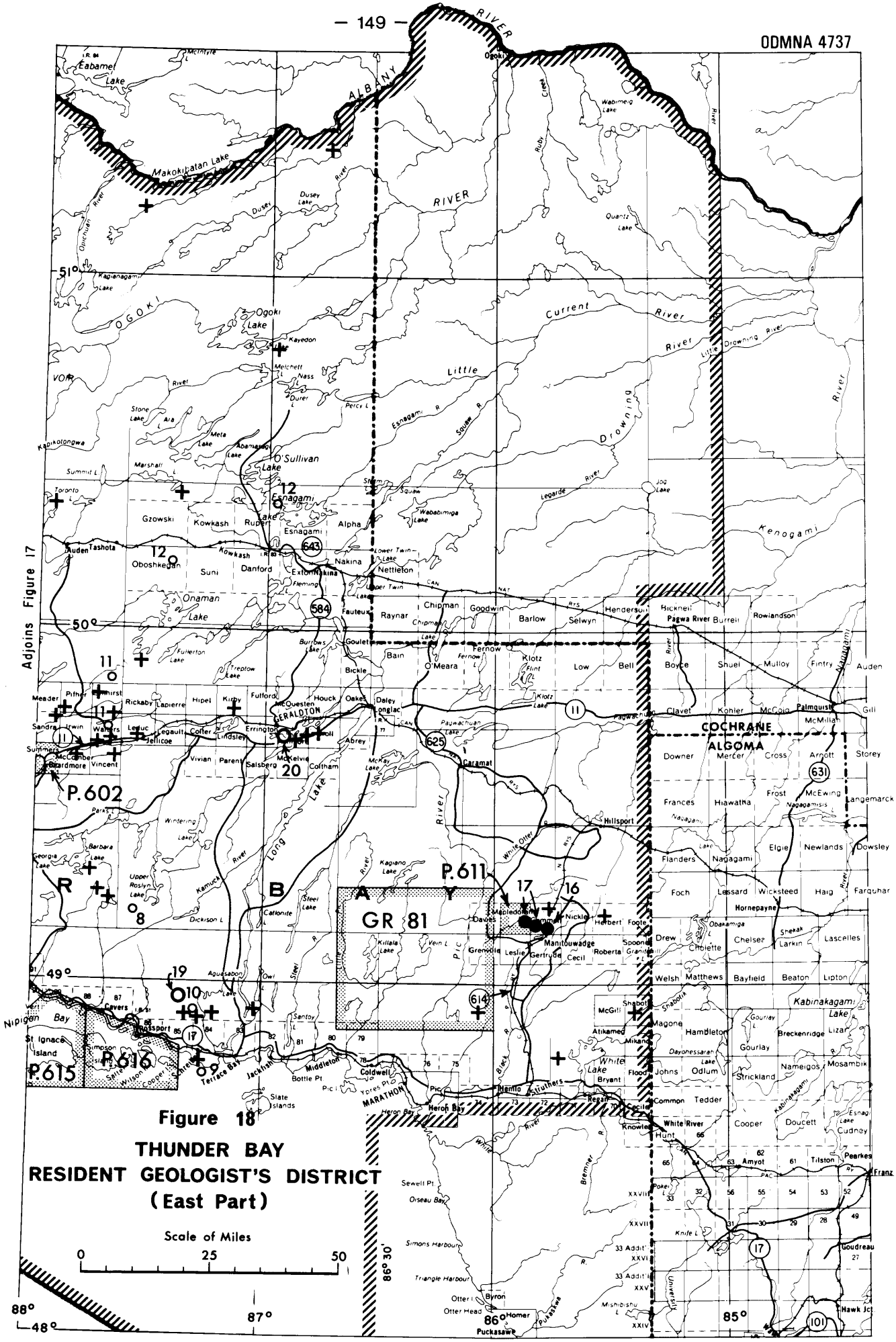
Thunder Bay District

Table

Figures

Figure 17
THUNDER BAY RESIDENT GEOLOGIST'S DISTRICT (West Part)




Adjoins Figure 17
Adjoins Figure 19
Eabamet Lake
Lake
ALBANY
RIVER
Ogoki
Makokibatan Lake
Dusey River
Dusey Lake
Quantz Lake
Ruby Creek
Wabimeig Lake
Ogoki Lake
OGOKI
Current River
Little Drowning River
Kenogami River
Kayedon
Melchett
Nass
Ourer
Percy L
Esnagami R
Squaw R
Stone Lake
Meta Lake
Abamasagi Lake
O'Sullivan Lake
Marshall L
Summit L
Toronto L
Shiram L
Squaw
Wababimiga Lake
Jog Lake
Legarde River
Gzowski
Kowkash
Rupert
Esnagami
Alpha
Auden
Tashota
Oboshkegan
Suni
Danford
Exton
Nakina
Nettleton
Lower Twin Lake
Upper Twin Lake
Onaman Lake
Fleming
Fauteux
Raynar
Chipman
Goodwin
Barlow
Selwyn
Hendersun
Bickneil
Pagwa River
Burrell
Rowlandson
Goulet
Burrows Lake
Fernow
Fernow L
Bain
O'Meara
Klotz
Flint
Low
Bell
Boyce
Shuel
Mulloy
Fintry
Auden
Treptow Lake
Fullerton Lake
Bickle
Meader
Pifher
Rickaby
Lapierre
Hipel
Kirby
Fulford
Houck
Oakes
Daley
Longlac
Klotz Lake
Clavet
Kohler
McCoig
Palmquist
Gill
McMillan
Sandra
Irwin
Walters
Leduc
Legault
Jellicoe
Coffer
Lindsley
Errington
GERALDTON
McQuesten
Pagwachuan Lake
COCHRANE
ALGOMA
Summers
McCamber
Beardmore
Vincent
Vivian
Parent
Salsberg
McKelvie
Cotham
McKay Lake
Caramat
Downer
Mercer
Cross
Arnott
Storey
Frances
Hiawatha
Frost
McEwing
Langemarck
Nagagamisis
Nagagami
Hillsport
Wintering Lake
Barbara Lake
Georgia Lake
Upper Roslyn Lake
Kamuscat River
Long Lake
Dickison L
Steel River
Steel Lake
Cathonite
Kagiano Lake
White Otter R
Flanders
Nagagami Lake
Elgie
Newlands
Dowsley
Foch
Lessard
Wicksteed
Haig
Farquhar
Hornepayne
Obakamiga L
Chelsea
Shekak
Larkin
Lascelles
Drew
Cholette
Spoonhill
Granitehill
Manitouwadge
Roberta
Cecil
Gertrude
Leslie
Grenville
Killala Lake
Vein L
Davies
Nickle
Herbert
Foote
Welsh
Matthews
Bayfield
Beaton
Lipton
Aguasabon Lake
Owl L
Santoy L
Nipigon Bay
Covers
Nipigon
St Ignace Island
Simpson Island
Sellers
Wilson
Cooper
Shirley
Terrace Bay
Jackfish
Middleton
Bottle Pt
Slate Islands
Pic
Coldwell
Ypres
MARATHON
Heron Bay
Pic R
Black R
Memrio
Struthers
Regan
Common
Tedder
Knowles
White River
Hunt
Cooper
Doucett
Esnag Lake
Cudney
Kabinakagami Lake
McGill
Shabot
Shabotik R
Magone
Hambleton
Gourlay L
Breckenridge
Lizar
Atikamed
Mikano
Dayonessarah Lake
Gourlay
Nameigos
Mosambik
White Lake
Bryant
Flood
Johns
Odlum
Strickland
Kabinakagami
Amyot
Tilston
Pearkes
Franz
Pakesley
Knife L
Goudreau
Sewell Pt
Orseau Bay
Simons Harbour
Triangle Harbour
Otter I
Otter Head
Byron
Homer
Puckasaw
Bremner R
Mishibishu L
Hawk Jct
P.602
P.611
P.615
P.616
GR 81
A
B
R
Y
Figure 18
THUNDER BAY
RESIDENT GEOLOGIST'S DISTRICT
(East Part)
Scale of Miles
0
25
50
88°
48°
87°
86°
30'
85°

INDEX TO FIGURES 17 AND 18

○ 4 Exploration Activity

		Commodity Sought
1.	Pigeon River	Copper, nickel
2.	Shebandowan area	Copper, nickel
3.	Lac des Mille Lacs area	Copper, nickel
4.	Petry-Graham area	Base metals
5.	Lac des Isles area	Copper, nickel
6.	Greenwich Lake area	Uranium
7.	Nipigon area	Mineralization in Proterozoic sediments and volcanics
8.	Kabamichigami Lake area	Copper, gold
9.	Schreiber area	Copper, molybdenum
10.	Rhea Lake area	Copper, molybdenum
11.	Beardmore-Geraldton area	Base metals
12.	O'Sullivan Lake area	Base metals, gold
13.	Survey Lake-Puddy Lake area	Base metals

◑ 14 Mines Under Development

14.	The International Nickel Company of Canada Ltd. (Shebandowan Mine)	Copper, nickel, platinum
15.	Great Lakes Nickel Ltd.	Copper, nickel, platinum

● Producing Mines

16.	Noranda Mines Ltd. (Geco Division)	Copper, zinc, gold
17.	Willroy Mines Ltd.	Copper, zinc, lead, silver
17.	Big Nama Creek Mines Ltd.	Copper, zinc
17.	Willecho Mines Ltd.	Copper, zinc, lead, silver
18.	Thunder Bay Amethyst Mines Ltd.	Amethyst

○ 20 Mines Terminating Operations in 1970

19.	Zenmac Metal Mines Ltd.	Zinc, cadmium
20.	Lake Shore Mines Ltd. (MacLeod-Mosher Division)	Gold, silver

+ Assessment Data Filed in 1970

(Refer to Table 25)

Literature Received

GR87	Final Geological Report
OFR 5049	Open File Report
P.611	Preliminary Map

THUNDER BAY DISTRICT

By

C.R. Kustra[1]

INTRODUCTION

The Thunder Bay Resident Geologist's district witnessed a sharp increase in prospecting activity. According to Mr. R. Poutanen, Mining Recorder for Thunder Bay, recorded claims increased by approximately 40 percent over 1969 and assessment credits increased 100 percent.

Two field geologists, K.G. Fenwick and W.H. McIlwaine are stationed in the Thunder Bay office. The former continued his mapping program in the Shonia Lake area; the latter, recently transferred from the Toronto office, completed a field project on Black Bay Peninsula and vicinity.

F.R. Harris resigned as field geologist and G.W. Johns, geological assistant, returned to university.

Activities of the Resident Geologist were varied. In addition to regular duties concerned with consultation, rock and mineral identification and office administration, the writer participated in numerous outdoor science teacher workshops, student field trips and elementary school lectures. Several geological field parties were visited, in addition to various mining and exploration operations.

Mineral exploration classes were held in November, conducted by a Department geological lecturer, E.B. Freeman. A Special Topics Series, involving resource personnel from the mining industry and Lakehead University, was held in the latter part of January. During the period May 30 to June 2, 1970, Mr. E.B. Freeman and Dr. S.A. Ferguson conducted a prospector's field course in the area.

A panel display and mineral exhibit was arranged by the Department during the Canadian Lakehead Exhibition.

Geological Surveys

Four geological survey parties were stationed in the district during the 1970 mapping season. J. Morin completed mapping Hagey and Conacher Townships in the Shebandowan area, and W.H. McIlwaine mapped the Proterozoic sediments and volcanics underlying the peninsula south of Black Bay. A helicopter-supported geological-geochemical program, led by M.W. Carter and W.J. Wolfe, was completed in the Nipigon-Rossport-Dickison Lakes area. W.O. Mackasey continued his work in the Beardmore area, mapping Barbara and Meader Townships.

---

[1]Resident Geologist, 179 South Algoma Street, Thunder Bay.
Manuscript accepted for publication February 17, 1971.

A brief description of the projects outlined above is contained in "Summary of Field Work, 1970, by the Geological Branch" (edited by E.G. Pye), Ontario Department of Mines and Northern Affairs, Miscellaneous Paper 43.

Two mapping projects are scheduled for the 1971 field season. W.H. McIlwaine will begin a two-year program covering McTavish and Dorion Townships and vicinity; W.O. Mackasey continues his project in the Beardmore area, mapping Pifher Township.

EXPLORATION, DEVELOPMENT, AND MINING

Exploration Activity

A 40 percent increase in the number of claims recorded and general widespread exploration reflected a moderate upsurge in activity during 1970. Several areas received relatively concentrated staking and exploration, and these are mentioned briefly in the following text. Locations of areas or properties mentioned in the text are indicated with a number or letter, enclosed by brackets and shown on Figures 17 and 18.

In the Pigeon River area (1), particularly Devon, Pardee and Crooks Townships, much exploration in the form of diamond drilling, trenching, and stripping has occurred. The many copper-nickel occurrences associated with Keweenawan diabase and gabbro dikes and sills are being thoroughly examined.

Great Lakes Nickel Ltd. has explored 10,700 feet in strike length of a favorable anorthositic gabbro host rock. Detailed feasibility studies indicate that an annual mining and milling operation of 6,000,000 tons is economically viable. A daily rate of 16,000 to 17,000 tons are estimated to produce 43,500,000 and 18,660,000 pounds of copper and nickel respectively. Diamond drilling has detailed approximately 106,000,000 tons of ore grading 0.40 percent copper, 0.20 percent nickel with $1.75 in precious metals (platinum, palladium, rhodium, gold and silver) (The Northern Miner, June 4, 1970, p.18, and July 2, 1970, p.3).

Activity continues in the Shebandowan area (2). In addition to The International Nickel Company of Canada Ltd.'s Shebandowan Mine and the company's explorations in the Greenwater Lake area, other companies and individuals are at work. Belore Mines completed geophysical surveys and diamond drilling on their Moss Township claim group (The Northern Miner, January 14, 1971, p.17).

Much of the ground along the Knife Lake Fault (see GR85, Map 2204 and GR66, Map 2149), extending from the Quetico Provincial Park boundary to Moss Township, is held by Falconbridge Nickel Mines. Freeport Canadian Exploration Company owns a large block of claims on the southeast side of Burchell Lake, covering felsic and mafic metavolcanic rocks intruded by granitic and dioritic to pyroxenitic material. Other companies and individuals, including Mandarin Mines and Noranda Mines, conducted exploration east of the Shebandowan Lakes.

A metavolcanic-metasedimentary belt, extending westerly from Henderson Lake, along the south side of Lac des Mille Lacs (3) was thoroughly prospected

last year for base metals by at least six companies. In excess of 400 claims were recorded to cover this belt.

In the Petry-Graham area (4) Protu Explorations, Ameranium Mines Ltd., and Northfield Mines explored ground underlain by granitic gneisses. An airborne electromagnetic survey was completed over a large part of the area for Northfield Mines by Questor Surveys. The results of the airborne survey indicated several conductive zones, believed to be caused by sulphide concentrations (Assessment files, Thunder Bay Resident Geologist's office).

The Lac des Isles mafic intrusive complex centres around Lac des Isles and extends southwesterly for several miles. More than 580 claims were recorded in 1970 to cover this extension (5). Principal claim holder in the area is the Meridian Mining Company which continues to explore the mafic rocks for copper and nickel.

The Greenwich Lake area has for several years received sporadic attention for the radioactive content of the rocks along the southwest side of Greenwich Lake (6). In addition to diamond drilling, trenching, and ground radiometric surveys, an airborne radiometric survey was completed for Univex Exploration and Development Corp. Attention has been directed to massive granite and granitic gneisses.

In the Nipigon area (7) several companies including Kennco Explorations, The Wolf River Mining Syndicate, and Anaconda American Brass Ltd. conducted surface exploration of the Proterozoic sedimentary and volcanic rocks and Keweenawan intrusives. Copper mineralization, such as chalcocite in the dolomitic and siltstone units of the Sibley Group sediments, and native copper and chalcocite in the sediments and basalts of the Osler Group, is well known.

The Kabamichigami Lake area (8) has for several years received much attention in the form of trenching, geophysical surveys, and diamond drilling. Common to the area are northwest-southeast- and northeast-southwest-trending fault zones, up to 150 feet in width, transecting granitic gneisses. The faults are highly silicified and locally contain fragments of altered mafic material that may represent former dikes, crushed and silicified. Pyrite and chalcopyrite are commonly associated with the silicified zones and are quite widespread along the faults. A study relating structure and mineralization, and exploring the intersection of faults, is warranted.

In the area south of Schreiber, particularly that portion between the Canadian Pacific Railway and Lake Superior (9), Univex Exploration and Development and several individuals have conducted ground geochemical and radiometric surveys, trenching and diamond drilling, and an airborne radiometric survey. The district is underlain by a complexly folded assemblage of felsic and mafic metavolcanics intruded by granitic rocks, in part monzonitic in composition. Chalcopyrite and molybdenite are weakly disseminated in the monzonite as discrete grains, and also in association with narrow quartz-filled fractures.

Approximately 6 miles northwest of Schreiber, in the Rhea Lake area (10) Briar-Court Mines and Halren Mines have acquired ground covering molybdenite and chalcopyrite mineralization occurring along the contact of mafic meta-

volcanic and granitic rocks. Briar-Court Mines completed trenching and sampling and plans further work in 1971 (The Northern Miner, October 22, 1970, p.8).

Nicohal Mines acquired 214 claims containing several nickel-copper and copper occurrences. The claims cover a strike length of approximately 8 miles along a volcanic-granite contact, and include a nickel-copper zone occurring on a part of the property formerly owned by Nicopor Mines. Geophysical surveys, geological mapping, and diamond drilling were conducted in 1969 by Zenmac Metal Mines. Additional drilling is recommended to test the occurrences at depth (The Northern Miner, October 1, 1970, p.16; Assessment files, Thunder Bay Resident Geologist's office).

Exploration for base metals in the Beardmore-Geraldton area lessened slightly last year (11). Prior to 1970, several companies, including Inco, conducted geophysical surveys and diamond drilling of the metavolcanic-metasedimentary belt extending from Lake Nipigon to Jellicoe. Much of the felsic to mafic complex extending north from Elmhirst-Rickaby-Lapierre Townships to Onaman Lake continued to be explored in 1970.

In excess of 840 claims were recorded during 1970 for the area lying between Oboshkegan and Gzowski Townships, O'Sullivan Lake and Esnagami Lake (12). Numerous claim blocks cover anomalous areas derived from airborne geophysical surveys flown over felsic and mafic metavolcanic rocks. A circular, ultramafic intrusive, carrying small amounts of copper and nickel sulphides occurs under Esnagami Lake and outcrops on the islands in the lake.

The Puddy Lake serpentinite is part of a folded complex of metavolcanic and metasedimentary rocks intruded by mafic to ultramafic material (13). Commerce Nickel Mines owns a group of claims covering much of the serpentinite mass surrounding Puddy Lake. Since 1965, trenching, geochemical and geophysical surveys and diamond drilling have been done. In 1969, Falconbridge Nickel Mines optioned the property in preparation for further exploration.

Other companies active in the area of the felsic and mafic metavolcanic rocks in the Tommy How-Survey Lakes area include Dome Explorations, The Phelps-Dodge Corp. of Canada, Yorbeau Mines and Jorex Mines.

Mining Activity

Seven mines operated in 1969, including two that terminated production. The mines are listed in the index to Figures 17 and 18.

Zenmac Metal Mines (19) terminated underground mining in mid-April 1970, and milling operations at the end of the month. Since the beginning of milling in April 1966, total production reached 181,830 tons of ore from which were recovered 55,668,734 pounds of zinc, 517,214 pounds of copper and 141,403 pounds of cadmium. The average grade of ore was 16.5 percent zinc and the net smelter return approximated $3,152,617 (The Northern Miner, October 22, 1970, p.3).

The MacLeod-Mosher Division of Lake Shore Mines poured the final gold brick on September 29, 1970 marking the closing of the last gold mine in the Geraldton-Beardmore area. Since milling operations began by MacLeod-Cockshutt

Mines in 1938, 2,071 gold bars have been poured. At year-end 1969, 13,541,038 tons of ore had been treated. In the 32-year life of the mine, 1,847,083 ounces of gold and 140,051 ounces of silver were recovered (The Northern Miner, September 3, 1970, p.17).

Thunder Bay Amethyst Mines Ltd. has become a public company. During 1970, approximately 300 tons of amethyst and amethystine stone were produced (R. Hartviksen, personal communication). The mine site is a favourite spot for tourists and rockhounds. More than 1,500 vehicles entered the property last year and it is estimated that over 3,000 visitors came to watch operations and purchase amethyst.

NEW INFORMATION

Literature and Maps

During the year, various reports and maps were received. Those containing information about the Resident Geologist's district are listed below.

Geological Reports

GR81 Geology of the Killala-Vein Lakes area, by M.E. Coates. The report describes geology and mineral deposits of an area including an alkalic syenite complex.

GR85 Geology of the Moss Lake area, by F.R. Harris. This publication covers an area, west and southwest of Shebandowan Lake, which is currently receiving much exploration activity.

GR87 Geology of Pardee and Devon Townships and the Stuart Location, by J.J.C. Geul. A description of the base metal prospect of Great Lakes Nickel Ltd. is included in this report.

Open File Reports

OFR5049 Geology of Crooks Township, Jarvis and Prince Locations and Offshore Islands, District of Thunder Bay, by J.J.C. Geul. A continuation of the project in Pardee and Devon Townships, the report describes Proterozoic geology and copper-nickel occurrences related to intrusive mafic dikes and sills.

OFR5051 Geology of the Bell Lake-Sturgeon Lake area, Districts of Kenora and Thunder Bay, by N.F. Trowell. The Mattagami Mines discovery is located a short distance east of the area covered by this publication.

Preliminary Maps

P.601 Eva Township and P.602, Summers Township, by W.O. Mackasey, show the geology and mineral deposits in the Beardmore area. Map scale 1 inch to 1/4 mile.

P.611 Mapledoram Township, by V.G. Milne, shows in detail the geology in the vicinity of the Manitouwadge base metal camp. Map scale 1 inch to 800 feet.

P.615 St. Ignace Island and Vicinity, west and east parts respectively,
P.616 Lake Superior District, by J.F. Giguere. Proterozoic geology of a group of islands, in the north part of Lake Superior, is shown. Map scale 1 inch to 1/2 mile.

Others

MP43 Summary of Field Work, 1970, by the Geological Branch, edited by E.G. Pye.

M.Sc. Thesis Geology of the Killala Lake Igneous Complex, District of Thunder Bay, by M.E. Coates, McGill University, 1967.

Ph.D. Thesis Stratigraphy of the Gunflint Iron-bearing Formation of Ontario, by A.M. Goodwin, University of Wisconsin, 1953.

ASSESSMENT REPORTS RECEIVED IN 1970

Assessment data filed for 1970 is summarized in Table 25. Eighty-eight pieces of data, excluding mechanical and manual work, were filed in 1970, compared with 58 pieces in 1969 and 53 pieces in 1968. Diamond drill core footage applied toward assessment credit totalled 86,338 feet, compared with 62,905 feet in 1969 and 72,132 feet in 1968.

Drill core submitted for assessment credit was supplied by A. Bahlieda (110 samples) and the H.K. Porter Co. (69 samples). Mr. Bahlieda's samples represent the Rove shale formation of Animikie age, and diabase and gabbro intrusive rocks of Keweenawan age, located in Crooks Township, 25 miles southwest of Thunder Bay. The H.K. Porter specimens were taken from drill core intersecting a serpentinized peridotite intrusive, in the Cirrus Lake area, approximately 15 miles northeast of Marathon.

Table 25 Assessment and other reports received in 1970

Explanation of Abbreviations

DDH - Diamond drill hole; number of holes drilled and total footage
Rpt. - Geological report
Mag. - Magnetometer survey
EM - Electromagnetic survey
SP - Self-Potential survey
Rad. - Radiometric survey

Ownership	Township or Area	N.T.S.	Year Work Performed	Type of Assessment Data
Adams, L.E. Thunder Bay, Ontario	Block Creek	52H6/SW	Sept. 1970	1 DDH-102'
Addicks Canadian Properties Inc.	Georgia Lake	42E4/NE	Sept.Oct. 1969	EM
Ameranium Mines Ltd.	Hanniwell Tp.	52G2/NE		Prospectus (not filed for assessment)
Anderson, John T. Shebandowan, Ontario	Hagey Tp.	52B9/NW	Jan.Feb. 1970	1 DDH-812'
Anglo American Nickel Corp. Ltd.	Georgia Lake	42E4/NE	Aug. 1968	6 DDH-2,617'
Bahlieda, A. Thunder Bay, Ontario	Crooks Tp.	52A3/SW	July 1970	2 DDH-1,750' Core Samples
Barringer Research Ltd.	Dusey Lake	42M7/NW	Mar. 1969	2 DDH -177'
Canadian Nickel Company Ltd.	Block Creek	52H4/NE	Mar. 1969	1 DDH-880'
" " "	Colliver Tp.	52G2/SE	Mar. 1970	2 DDH-722'
" " "	Lac Des Mille Lacs	52B15/SE	Sept. 1969	1 DDH-226'
" " "	Blackwell,Laurie Tps.	52A12/NW,SW	July-Nov. 1969	11 DDH-7,521'
" " "	Ames Tp.	52B10/NE	Feb. Mar. 1970	1 DDH-450'
" " "	Begin Tp.	52B9/SW	Jan-July 1970	8 DDH-5,630'
" " "	Conacher Tp.	52B9/NE	1969	14 DDH-9,560'
" " "	Hagey Tp.	52B9/NE	1969	7 DDH-7,233'
" " "	Haines Tp.	52B9/SW	1970	1 DDH-657'
" " "	Lamport Tp.	52B9/SE	1969	2 DDH-916'
" " "	Moss Tp.	52B10/SW	Sept. 1969	1 DDH-153'
" " "	Burchell Lake	52B10/SE	Feb. 1970	3 DDH-810'
" " "	Powell Lake	52B7/NW	Aug. 1969	2 DDH-289'
" " "	Saganagons Lake	52B7/SW	Sept. 1969	2 DDH-304'
" " "	Kirby Tp.	42E14/SE	Sept. 1969	2 DDH-322'
" " "	Leduc Tp.	42E12/NE	1969	7 DDH-1,685'
" " "	McComber Tp.	42E12/SW	Aug. 1969	4 DDH-749'
" " "	Vincent Tp.	42E12/SE	1969	8 DDH-1,562'
" " "	Walters Tp.	42E12/SW	1969,1970	3 DDH-995'
" " "	Onaman Lake	42E13/SE	July 1969	2 DDH-345'
" " "	Onaman Lake	42E14/NW	May-June 1970	2 DDH-1,097'
Canadian Onex Mines Ltd.	Shabuskwia	52P2/NE 52P7/SE	Feb. 1970	Airborne EM, Mag.
Caprive Oil & Gas Co. Ltd.	Crooks Tp.	52A3/SW	Nov. Dec. 1969	Mag.
Carravelle Mines Ltd.	Heron Bay-White Lake	42C13/SW	Aug. 1969	8 DDH-3,819'
Chimo Gold Mines Ltd.	Melchett Lake	42L14/SE	Mar.-June 1969	5 DDH-1,494' EM, Mag. Geochemical
Chimo Gold Mines Ltd.	Peninsular Lake	42M4/NE	Feb.1969	EM
Cliffs of Canada Ltd.	Lac Des Mille Lacs	52B16/SW	Mar. 1970	EM
Creswell Mines Ltd.	Gillies, O'Connor Tps.	52A5/SE	1968,1969	12 DDH-3,162' Geological Geochemical
Falconbridge Nickel Mines Ltd.	Hebert Tp.	42F4/NE	1969	Assay results for Copper, Nickel,Zinc,Gold. Diamond drilling on cls. 112514,112515
" " "	" "	42F4/NE	1970	1 DDH-399'
" " "	Shebandowan(Home Lake)	52B7/NW	Aug. 1970	1 DDH-607'
" " "	Haines Tp.	52B9/NW	Jan-Mar. 1970	8 DDH-532'
Hannam, Lenore G. Ottawa, Ontario	Tp. 80	42D15/SE	May 1970	2 DDH-206'
Hollinger Mines Ltd.	Ashmore Tp.	42E10/NW	Aug. Sept. 1970	1 DDH-642'

Ownership	Township or Area	N.T.S.	Year Work Performed	Type of Assessment Data
Holm, Hilda M. Geraldton, Ontario	Ashmore,Croll Tps.	42E10/NE/NW	June 1970	1 DDH-160'
" " "	Sandra,Meader Tps.	42E12/NW 42E13/SW	June-July 1970	2 DDH-323'
International Mogul Mines Ltd.	Gzowski-Kowkash	42L5/NW/SE	Dec. 1969	15 DDH-7,992'
Jacobus Mining Corp. Ltd.	Elmhirst Tp.	42E13/SE	1969	Rpt. EM, Mag.
Kagiano Mines Ltd.	Georgia Lake	42E5/SW	Mar. 1969	EM, Mag., Geological
Koosel, F.	Gzowski-Kowkash	42L6/NW	Jan.-Mar. 1970	EM, Mag.
Mandarin Mines Ltd.	Hagey,Conacher Tps.	52B9/SE	Sept.Oct. 1969	EM, Mag. Core samples
McWilliams, D.B. Toronto, Ontario	Paipoonge,Scoble Tps.	52A5/SE	Sept.Oct. 1969	AM,Mag. Geochemical.
Meridian Mining and Exploration Company Ltd.	Block Creek	52H4/NE	Mar.1970	EM
Midland Nickel Corp. Ltd.	Pardee,Crooks Tps.	52A4/SE	July.Aug. 1970	2 DDH-740'
Monpre Iron Mining Ltd.	Duckworth,Laurie Tps.	52A12/SW		Prospectus and Rpt. (not filed for assessment)
Morton, C. Pasadena,California	Loon Lake	52A15/SW	Feb. 1969	Airborne Rad.
Nicohal Mines Ltd.	Duck Lakes-Schreiber	42D14/NE/NW	1969	Rpt.
Noranda Exploration Company Ltd.	Adrian Tp.	52A5/NW	1967	EM, Mag
Noranda Exploration Company Ltd.	Conmee Tp.	52A5/NE	1967	EM,Mag.
Noranda Exploration Company Ltd.	Hanniwell Tp.	52G2/SW	Jan. 1967	EM,Mag.
Noranda Mines Ltd.	Gemmell Tp.	42F4/NW	Sept. 1969	Rpt.
North Coldstream Mines Ltd.	Gzowski-Kowkash	42L5/NW/SW	July-Dec. 1969	7 DDH-6,718'
North Rankin Nickel Mines Ltd. (Now Tontine Mining Ltd.)	Heron Bay-White Lake	42D16/SW	May-Aug. 1969	Mag
Northfield Mines Inc.	Hogarth-Upsala	52G2/NE 52G7/SW/SE	Dec. 1969 Jan. 1970	Airborne EM, Mag.
Norway Lake Iron Mines Ltd.	Pardee Tp.	52A4/SE	May 1970	1 DDH-218'
Petrick, J. Thunder Bay, Ontario	Pifher Tp.	42E13/SW	Oct. 1969	1 DDH-195'
Phelps Dodge Corp. of Canada Ltd.	Block Creek	52H6/SE	Apr.Aug.1970	4 DDH-424'
H.K. Porter Company Ltd.	Heron Bay-White Lake	42D16/NE/NW	Jan.-Mar. 1969 Mar.-Aug. 1970	Mag. 7 DDH-4,451' Core samples
H.K. Porter Company Ltd.	Elmhirst,Walters Tps.	42E12/NE 42E13/SE	June-July 1968	EM
Tantalum Mining Corp. of Canada Ltd.	Zig Zag Lake	52I8/NW	May-Aug. 1969	EM, Mag.Rpt. Assays for Tantalum
Tontine Mining Ltd.	Tps. 77,78	42D15/SE 42D16/SW	1969	Rpt. Assays for nepheline
Two L's Mining Company Ltd.	Shabotik Tp.	42C14/NW	Oct. 1969	4 DDH-234'
Univex Exploration and Development Corp. Ltd.	Loon Lake	52A15/SW	Nov.Dec. 1969 Jan.Feb. 1970 Dec. 1969	14 DDH - 1399' Airborne Rad.
Univex Exploration and Development Corp. Ltd.	Tp. 84	42D14/SE	Feb.June 1969	5 DDH-1,460'
Wodian, J.	Meader Tp.	42E13/SW	Aug. 1970	1 DDH-165'
Woynarski, J.	Lamport Tp.	52B9/SE	Dec. 1969	2 DDH-1,325'
Zenmac Metal Mines Ltd.	Duck Lakes-Schreiber	42D14/NW	Sept. Oct. 1969	Mag. 8 DDH-2,107'
Zenmac Metal Mines Ltd.	Duck Lakes-Schreiber	42D14/SE	Dec. 1969	Mag, Geochemical.
Zmudzinski, J. Jellicoe, Ontario	Zig Zag Lake	52 I 1/NE	Sept. 1970	Mag, S.P.

TIMMINS DISTRICT

By

E.G. Bright

CONTENTS

Timmins District

Tables

Figures

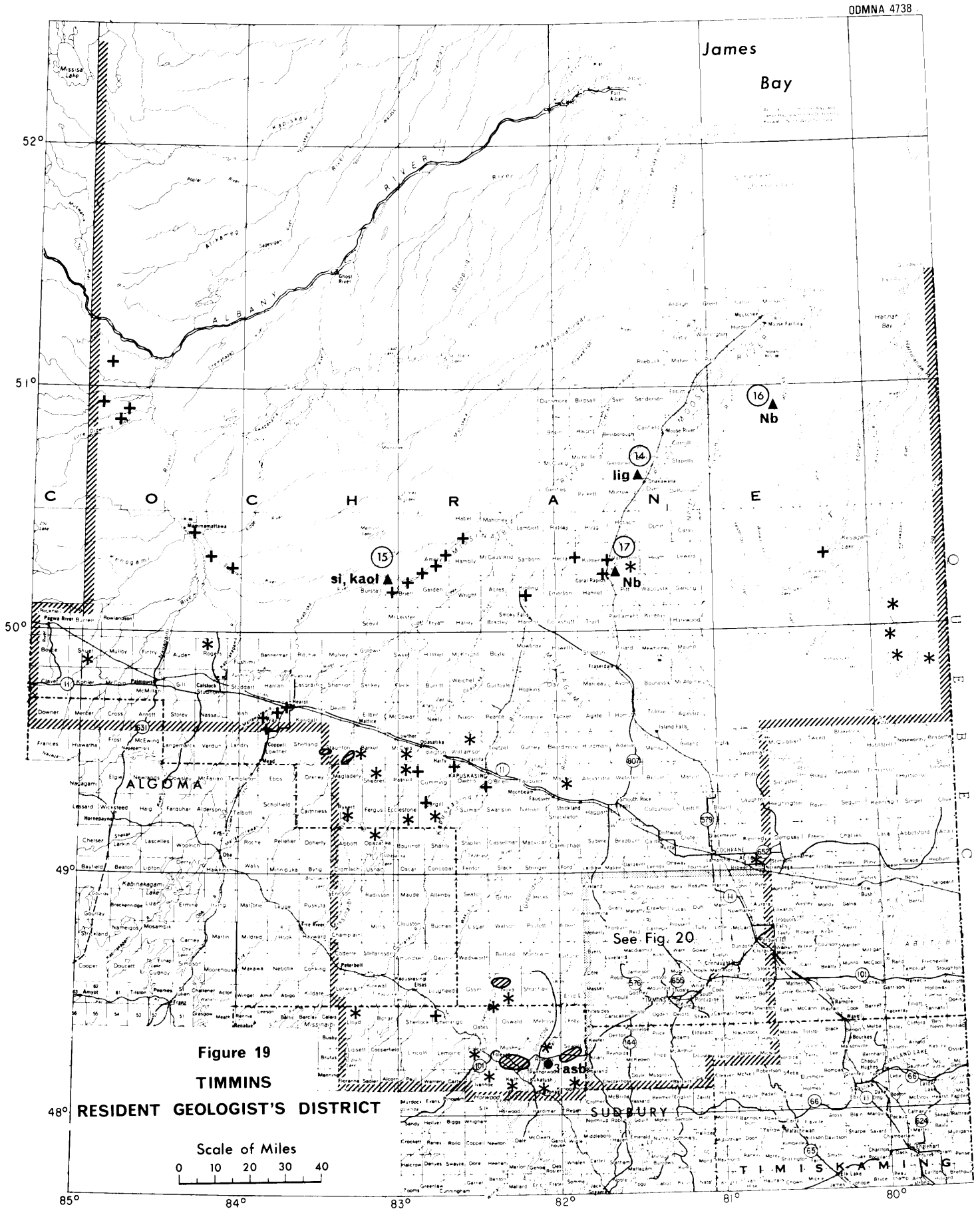
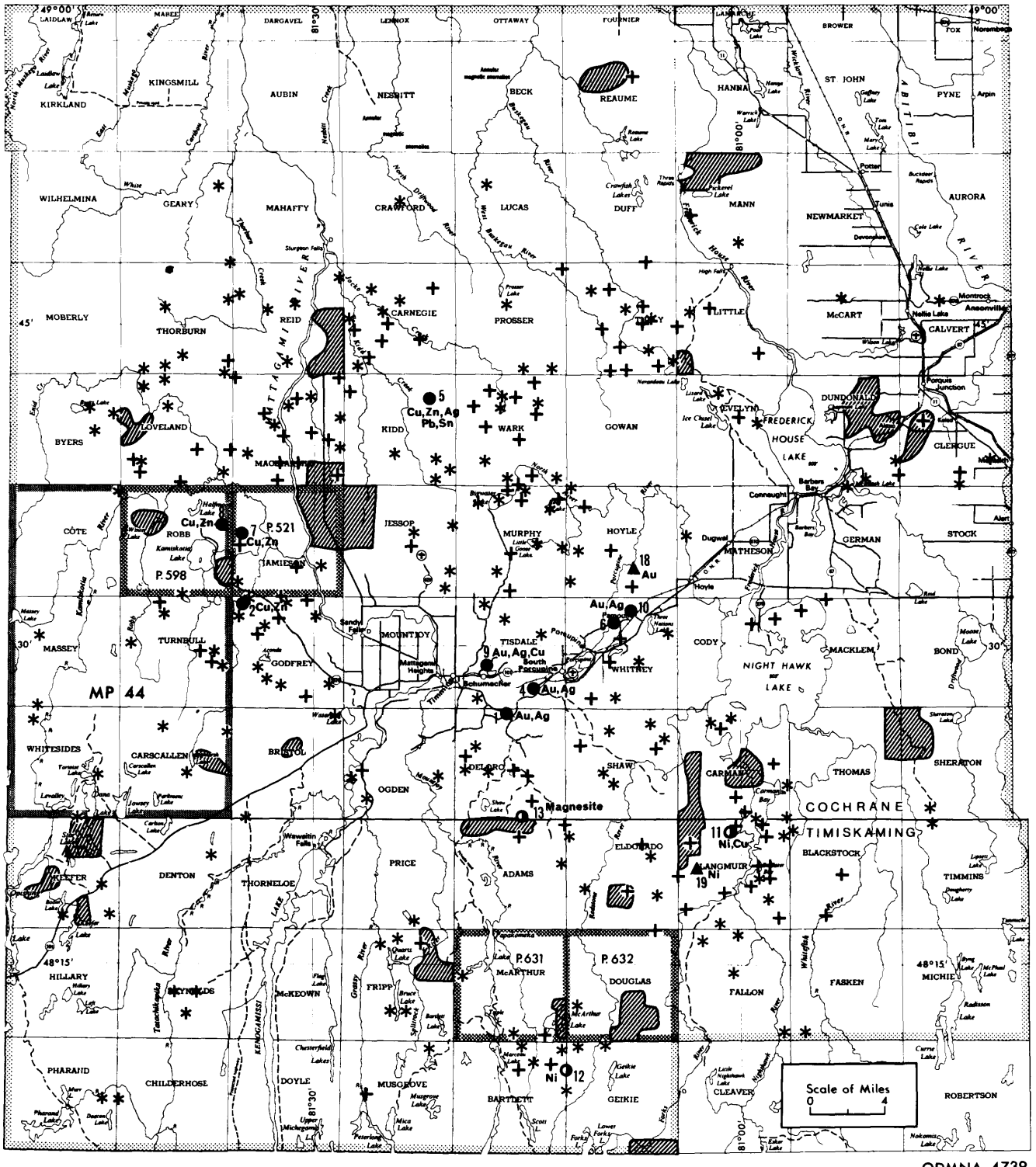


Figure 19

TIMMINS

RESIDENT GEOLOGIST'S DISTRICT



ODMNA 4739

Figure 20 – Timmins area

EXPLANATION

- ●2 Producing mine
- ○12 Property under development
- ▲18 Property under exploration and evaluation
- \+ Assessment data filed in 1970
- ✱ Area of staking activity, minor and major respectively
- P.632 New maps and(or) reports (with number) MP - Miscellaneous Paper P - Preliminary Map
- Boundary of Resident Geologist's District

INDEX TO FIGURES 19 AND 20

Producing Mines

●

1. Aunor Gold Mines Limited .... Gold, Silver
2. Canadian Jamieson Mines Limited .... Copper, Zinc
3. Canadian Johns-Manville Co. Ltd., Reeves Mine .... Asbestos
4. Dome Mines Limited .... Gold, Silver
5. Ecstall Mining Ltd., Kidd Creek Mine .... Copper, Zinc, Silver, Lead, Tin
6. Hallnor Mines Limited .... Gold, Silver
7. Jameland Mines Limited .... Copper, Zinc
8. Kam-Kotia Mines Limited .... Copper, Zinc
9. McIntyre Porcupine Mines Limited .... Gold, Silver, Copper
10. Pamour Mines Limited .... Gold, Silver

Properties Under Development

◑

11. Noranda-Inco, Langmuir Tp. Project .... Nickel, Copper
12. Sheridan-Texmont, Bartlett-Geikie Mine .... Nickel
13. Canadian Magnesite, Deloro Tp. deposit .... Magnesite

Properties under Exploration and Evaluation

▲

14. Alberta Coal Ltd., Onakawana Project .... Lignite
15. Algocen Mines Ltd., Missinaibi R. Project .... Kaolin, Silica-Sand
16. Consolidated Morrison Expln. Ltd., Moosonee Project ... Columbium
17. " " " " Valentine " ... Columbium
18. Inco, Hoyle Tp. prospect .... Gold
19. Tontine Mining Co. Ltd. (formerly McWatters-Langmuir Prospect .. Nickel

TIMMINS DISTRICT

By

E.G. Bright[1]

SUMMARY

In the 60-year period since 1910 when the Hollinger Gold Mine first went into production, the Timmins region has produced over 2 billion dollars from its gold, silver, copper, zinc, and asbestos deposits. This sum almost equals the total monies generated by the entire mineral production of Ontario during 1969.

In 1970, mineral production in the Timmins region was derived from five gold-silver operations, five copper and copper-zinc operations and one asbestos operation. New developments include the 1971 production start-up of the Noranda-Inco nickel-copper orebody in Langmuir Township, and the Sheridan-Texmont nickel orebody in Bartlett Township, both south of Timmins. In addition to these two new base metal producers, feasibility reports are pending on the following mineral deposits:

a) The Canadian Magnesite deposit of magnesite in Deloro Township.
b) The Tontine Mines Ltd. (formerly McWatters) nickel deposit in Langmuir Township.
c) The Consolidated Morrison columbium deposit near Moosonee.
d) The Algocen Mines silica-sand-kaolin deposits north of Hearst.

INTRODUCTION

The Timmins Resident Geologist's office is now located together with the Mining Recorder's office at 60 Wilson Avenue in Timmins.

Regular duties of the Resident Geologist include field mapping, collecting, filing, and compiling geological and mineral exploration data, discussions with prospectors and exploration geologists, visiting mining operations and examining mining properties; also geological talks to various schools, professional, and social groups in the district.

Geological Surveys

During 1970, the author carried out a helicopter-supported field mapping and drill core collection survey in a block of 45 townships situated immediately north of Timmins (Pamour Sheet). Operation Pamour was designed to gather all available geological data and drilling information heretofore not available to the public at large. The results of this mapping and sampling program are to be

---

[1]Resident Geologist, 60 Wilson Avenue, Timmins.
Manuscript accepted for publication February 18, 1971.

combined with all other filed geological and geophysical information to produce Timmins Data Series Maps (see published ODM Prelim. Map P.486, Timmins Data Series, Kidd Township). Prior to the release of these township maps a new geological compilation of the Timmins region will be issued at a scale of 1 inch to 2 miles.

D.R. Pyke completed a geological survey of McArthur and Douglas Townships; P.C. Thurston, G.M. Siragusa, and R.P. Sage carried out a helicopter reconnaissance field mapping survey of the Chapleau-Foleyet region; and R.S. Middleton co-ordinated three programs in the area: 1) a gravity survey in the Timmins region, 2) a ground magnetic survey of Loveland and MacDiarmid Townships and 3) nine flight lines flown in the Kamiskotia area using a gamma-ray spectrometer and a Radiophase VLF-EM system.

EXPLORATION ACTIVITY

The tempo of exploration activity in the area continued its upward trend, and in recent years is only surpassed by the two years 1965 and 1966 which reflected the intense activity immediately following the announced discovery of the Texas Gulf base metal deposit in April 1964.

Table 26 Chart of Recent Exploration Activity

	1963	1964	1965	1966	1967	1968	1969	1970
Total Applied Days Assessment Credit	40,370	146,633	486,246	227,732	117,299	42,575	143,304	167,468
Days Credit for Diamond Drilling	34,328	48,095	242,869	151,747	79,634	42,575	86,397	96,946
Days Credit for Geophysics	2,348	93,863	224,959	65,577	32,220	26,896	53,497	59,013
Total Claims Staked	1,971	20,823	47,900	5,724	2,944	3,923	3,482	3,900

The major portion of this increased activity is due to the participation of major mining concerns. In addition to the use of new airborne and ground techniques, exploration companies are utilizing new techniques in whole-rock geochemistry, soil geochemistry and basal-till geochemistry which are particularly applicable to the clay-till overburden characteristics of the region north of Timmins.

To-date the following companies have established exploration offices in Timmins to co-ordinate their operation in northeastern Ontario:

Amax Exploration Ltd.
Canadian Jamieson Mines Ltd.
Dome Exploration Ltd.
Falconbridge Exploration Ltd.
Hollinger-Imperial Oil Consortium
Canadian Nickel Exploration Ltd.

Table 27 Assessment and other reports received in 1970

EXPLANATION

Refer to Figures 19 and 20 for approximate location of assessment work.

Symbols and Abbreviations

Au: gold
Ag: silver
Mo: molybdenite
sp: sphalerite
Ni: nickel
asp: arsenopyrite
IF: iron formation
Cp: chalcopyrite
Cu: copper
Mag: magnetite

DDH: diamond drill hole
AMag: airborne magnetometer survey
Mag: ground magnetometer survey
AEM: airborne electromagnetic survey
EM, EM16, JEM, Radem: ground electromagnetic surveys
VEM: ground vertical loop electromagnetic survey
HEM: ground horizontal loop electromagnetic survey
VLF: ground very low frequency electromagnetic survey
geol: geological report

Location	Ownership	Commodity Found	Type of Work	Year	File No.
Adams Tp.	Dr.R.Opatowski,c/o The Lord Simcoe Hotel,150 King St., Toronto, Ont.		Trenching	1970	T-642
Adams Tp.	Canadian Nickel Co.		3 DDH for 3728'	69-70	T-1383
Amery Tp.	The Algoma Steel Corp.L.-Algoma Ore Division (Also known as Algocen Mines Ltd.)	Kaolin, trace Au	gravel sampling pits,tests on clay, 13 DDH-1767'	68-69	T-1303
Bartlett Tp.	Silver Summit Mines Ltd.		5 DDH - 2200'	1969	T-1091
Bartlett Tp.	R.Allerston,322 Elm St.N.,Timmins		Trenching	1970	T-619
Blackstock Tp.	L.E.Hill,66 Helmer Ave., South Porcupine,Ont. P.O.Box 1022	Trace Mo	1 DDH - 123'	1970	T-1482
Bristol Tp.	W.Kuehne, 76 Fourth Ave., P.O.Box 315, Schumacher,Ont.		Stripping, 1 DDH - 245'	1970	T-1099
Cargill Tp.	Union Carbide Canada Mining Ltd.		Mag.	1969	T-1171
Carman Tp.	Canadian Nickel Co.		11 DDH-10036'	69-70	T-1009
Carman Tp.	J. Larche, 721 Churchill St., Timmins, Ont.		Mag., VEM	69-70	T-1223

Table cont.

Location	Ownership	Commodity Found	Type of Work	Year	File No.
Carman Tp.	A. Theriault, 551 Spruce St.S. Timmins, Ont.		Mag.,VEM	'69-70	T-685
Carman Tp.	P.T.George,391 John St.,Timmins		Mag.	1970	T-655
Carnegie Tp.	Mercury-Chipman Co. Ltd.		Mag.,VEM	1969	T-939
Carnegie Tp.	Cromarty Exploration Co. Ltd.		Mag.,VEM	68-69	T-1246
Carnegie Tp.	Area Mines Ltd.		VEM	1969	T-1197
Carnegie Tp.	Cromarty Exploration Co. Ltd.		1 DDH - 591'	1970	T-1140
Carnegie Tp.	Hollinger Mines Ltd.		2 DDH - 1262'	1970	T-1454
Carnegie Tp.	Hollinger Mines Ltd.		AEM- Input	1970	T-681
Clergue Tp.	Amax Exploration, Inc.		EM	1969	T-691
Clergue Tp.	Amax Exploration, Inc.		Mag.	1969	T-1282
Clergue Tp.	Amax Exploration, Inc.		VEM	1969	T-1213
Cody Tp.	Canadian Nickel Co.		Mag., EM	1969	T-1434
Cody Tp.	Canadian Nickel Co.		6 DDH - 4857'	69-70	T-1494
Deloro Tp.	Canadian Nickel Co.		Mag., EM, 1 DDH - 613'	1970	T-1341
Deloro Tp.	Canadian Nickel Co.		Mag.	1970	T-1206
Deloro Tp.	P.C.Reidy,85 Williams St., Bradford,Penna, USA		Trenching	1970	T-641
Deloro Tp.	M.I.Watson, c/o Lynx-Canada Explorations Ltd., 1212- 80 King St.W., Toronto, Ont.		7 DDH -3124'	1970	T-1083
Douglas Tp.	Newmont Mining Corpn. of Can.Ltd.		3 DDH-1583'	1969	T-1183
Duff Tp.	Noranda Exploration Co.		Mag., VEM	68-69	T-1269
Dundonald Tp.	Volcanic Mines Ltd.		Mag.	1970	T-1474
Dundonald Tp.	Amax Exploration, Inc.		Mag.	1969	T-1282
Eldorado Tp.	L. Proulx, 151 Wilson Ave., Timmins, Ont.		Trenching	1969	T-1060
Eldorado Tp.	Newmont Mining Corpn. of Can.Ltd.		3 DDH-1583'	1969	T-1182
Eldorado Tp.	Canadian Nickel Co.		3 DDH-3728'	69-70	T-1383
Eldorado Tp.	Falconbridge Nickel Mines Ltd.	Ni	Mag., HEM	1969	T-1387
Eldorado Tp.	Canadian Nickel Co.		Mag., 2 DDH - 1730'	1970	T-687

Location	Ownership	Commodity Found	Type of Work	Year	File No.
Area of English River Post	Keevil Mining Group Ltd.		1 DDH - 960'	1969	T-378
Area South of English River Post	Keevil Mining Group Ltd.		5 DDH - 3495'	1969	T-381
Evelyn Tp.	Hollinger Mines Ltd.		VLF, Mag., 1 DDH - 334'	1967, 69-70	T-930
Fripp Tp.	Hollinger Mines Ltd.	IF,trace cp	4 DDH - 1117'	1970	T-660
Garden Tp.	The Algoma Steel Corp.Ltd.- Algoma Ore Division (Algocen)	Kaolin, trace Au	gravel sampling, pits,tests on clay 13 DDH - 1767'	68-69	T-1303
German Tp.	Canadian Nickel Co.		Mag., EM	1969	T-1494
Godfrey Tp.	Hollinger Mines Ltd.	Trace sp, cp, Ag.	15 DDH -12034'	69-70	T-1460
Godfrey Tp.	Cu-Kam Porcupine Mines Ltd.		1 DDH - 522'	1970	T-963
Godfrey Tp.	Conwest Exploration Co. Ltd.		JEM, VEM, VLF, Mag.	1969	T-1490
Godfrey Tp.	Timrod Mining Co. Ltd.		Mag., VEM,VLF	1969	T-990
Godfrey Tp.	Mespi Mines Ltd.	Minor cp, sp	VLF, 3 DDH - 1840'	69-70	T-1190
Habel Tp.	The Algoma Steel Corp.Ltd.- Algoma Ore Division (Algocen)		gravel sampling, pits, tests on clay, 13 DDH - 1767'	68-69	T-1303
Hambly Tp.	The Algoma Steel Corp. Ltd.- Algoma Ore Division (Algocen)		gravel sampling, pits, tests on clay, 13 DDH - 1767'	68-69	T-1303
Hamlet Tp.	Coral Lime & Chem. Ltd.		geol., pits, gravel sampling	1969	T-658
Hecla Tp.	R.Draper, 156 Birch St. N., Timmins, Ont.		VEM, Mag.,soil sampling	1969	T-1336
Hoyle Tp.	Canadian Nickel Co.		3 DDH - 1975'	1969	T-1321
Hoyle Tp.	A. Salo, 228 Way Ave.,Timmins,Ont.		Mag., VEM	1969	T-1342
Hoyle Tp.	S.W.Elkind, 5 Shallmar Blvd.,Toronto, Ontario		Mag.,VLF, prospectus	1969	T-1316
Jamieson Tp.	Conwest Exploration Co. Ltd.		Mag.,JEM,VEM, VLF, 3 DDH - 1422'	1969	T-1490
Jamieson Tp.	Hollinger Mines Ltd.		Mag.	1969	T-1371
Jamieson Tp.	Mid-North Engineering Services Ltd.	Trace cp.	2 DDH - 1213'	1970	T-293

Location	Ownership	Commodity Found	Type of Work	Year	File No.
Jessop Tp.	Hollinger Mines Ltd.		1 DDH - 782'	1970	T-1141
Kesagami Lake Area	Argor Explorations Ltd.		Mag., VEM, reports, assays, 7 DDH - 4228'	69-70	T-1061
Kidd Tp.	Mespi Mines Ltd.		VEM	1969	T-1314
North of Killick Lake Area	Keevil Mining Group Ltd.		3 DDH - 2378'	1969	T-325
Kilmer Tp.	Coral Lime & Chemical Ltd.		Geol., pits, gravel sampling	1969	T-658
Kilmer Tp.	R.Draper, 156 Birch St. North, Timmins, Ontario		VEM, Mag., soil sampling, 6 DDH-2000'	69-70	T-1336
Kipling Tp.	B. Douglas, 36 Wimpole Dr., Willowdale, Ont.		pits, sampling	1970	T-663
Langmuir Tp.	Summit Explorations and Holdings Limited		Mag., VEM, 1 DDH - 395'	1970	T-954
Langmuir Tp.	Falconbridge Nickel Mines Ltd.	Ni	Mag., HEM	1969	T-1387
Langmuir Tp.	Lacanex Mining Co. Ltd.		Mag., VEM, 3 DDH - 1450'	69-70	T-1228
Langmuir Tp.	J.Kascinszko,205 Shaughnesy St., Sudbury, Ont.		3 DDH - 2815'	69-70	T-993
Langmuir Tp.	Canadian Nickel Co.		Mag., EM, 1 DDH - 990'	1969	T-1330
Langmuir Tp.	A. Camisso, 9th Floor, 366 Bay St., Toronto, Ont.		Mag.,Geochem.	1969	T-1312
Langmuir Tp.	A. Camisso		3 DDH - 2632'	1970	T-665
Langmuir Tp.	Canadian Nickel Co.		5 DDH - 4427'	1970	T-1018
Langmuir Tp.	Tex-Sol Exploration Ltd.		HEM, Geochem.	1969	T-961
Langmuir Tp.	Canadian Nickel Co.		5 DDH - 5374'	69-70	T-1368
Langmuir Tp.	J.R.B.Parres,P.O. Box 820, South Porcupine, Ont.		VEM, Mag.	1970	T-684
Langmuir Tp.	Con Shawkey Gold Mines Ltd.		Geol.Assays	1969	T-1292
Langmuir Tp.	J.F.Brown, Toronto, Ont.		Mag., EM	1970	T-665
Little Tp.	Noranda Exploration Co.		Mag., VEM	68-69	T-1245
Little Tp.	Cromarty Exploration Co. Ltd.		Mag., VEM	68-69	T-1246
Little Tp.	Noranda Exploration Co.		VEM	1969	T-1270
Area South of Lone Lake	Keevil Mining Group Ltd.		1 DDH - 1203'	1969	T-376

Location	Ownership	Commodity Found	Type of Work	Year	File No
Loveland Tp.	MacDonald Mines Ltd.		Trenching	1970	T-785
Loveland Tp.	Hollinger Mines Ltd.		AEM - Input	1970	T-681
Loveland Tp.	Hollinger Mines Ltd.		4 DDH - 2659'	1970	T-1434
MacDiarmid Tp.	Mespi Mines Ltd.		JEM	1968	T-1311
MacDiarmid Tp.	G.S.Killeen, Box 1031, 465 Patricia Blvd.,Timmins,Ont.		Mag.	1969	T-1475
MacDiarmid Tp.	Mespi Mines Ltd.	Trace cp	VEM, Mag., 1 DDH - 618'	68-69	T-1462
MacDiarmid Tp.	Noranda Exploration Co.		Mag., VEM, 1 DDH - 502'	1969	T-1275
MacDiarmid Tp.	Canadian Jamieson Mines Ltd.		3 DDH - 1393'	1970	T-742
MacDiarmid Tp.	Hollinger Mines Ltd.		AEM - Input	1970	T-681
MacDiarmid Tp.	Hollinger Mines Ltd.		4 DDH - 2659'	1970	T-1434
Macklem Tp.	Canadian Nickel Co.		Mag., EM, 6 DDH - 4857'	1969	T-1494
Mann Tp.	Noranda Exploration Co. Ltd.		Mag., VEM	1969	T-1356
McArthur Tp.	B.Whitmarsh, 544 Spruce St.S, Timmins, Ont.		Trenching	1970	T-616
McBrien Tp.	The Algoma Steel Corp.Ltd.-Algoma Ore Division (Algocen)	kaolin, minor Au	gravel sampling, pits,tests on clay, 13 DDH - 1767'	68-69	T-1303
Murphy Tp.	Hollinger Mines Ltd.		AEM, - Input	1970	T-681
Murphy Tp.	Renzy Mines Ltd.		1 DDH - 527'	1969	T-1110
Murphy Tp.	Volcanic Mines Ltd.		Mag., 1 DDH - 388'	1969	T-1474
Murphy Tp.	Noranda Exploration Co. Ltd.		Mag., VEM	1970	T-1153
Murphy Tp.	Noranda Exploration Co.		Geol.	1969	T-1456
Musgrove Tp.	A.H.Dumoulin,27 Elm St. S.,Timmins		Geol.	1970	T-1071
O'Brien Tp.	J.Arsenault, 40 Blvd.,L'Etang, Kapuskasing, Ont.		Stripping & Trenching	1970	T-611
Ogden Tp.	Hollinger Mines Ltd.		1 DDH - 743'	1970	T-645
Owens Tp.	Tombill Mines Ltd.	Cu,Ni?	Geol.,Geochem., Mag.,HEM, 2 DDH - 995'	68-69	T-1178

Location	Ownership	Commodity Found	Type of Work	Year	File No
Parnell Tp.	N.Arsenault, P.O.Box 82, Kapuskasing, Ont.		2 DDH - 385'	1969	T-1397
Pitt Tp.	Coral Lime & Chemical Ltd.		Geol., pits, gravel sampling	1969	T-658
Prosser Tp.	Texmont Mines Ltd.	Trace cp.	Mag., VEM, 2 DDH - 1104'	69-70	T-1007
Reaume Tp.	E.F.Carr,Box 67,Toronto-Dominion Centre, Toronto 111,	Trace cp	Mag., VEM, 5 DDH - 1980'	1969	T-695
Reid Tp.	Hollinger Mines Ltd.		4 DDH - 2659'	1970	T-1434
Shaw Tp.	R. E. Allerston,322 Elm St.N., Timmins, Ontario		Mag., 3 DDH-1729'	1970	T-1200
Shaw Tp.	Canadian Nickel Co.		1 DDH - 605'	1970	T-1495
Shenango Tp.	P. Barry, 1612 - 2 Carlton St., Toronto 2, Ont.		1 DDH - 501', Mag.,EM, Geology	1970	T-1134
Sherlock Tp.	P. Barry, 1612 - 2 Carlton St., Toronto 2, Ont.		Mag., EM, Geol., 1 DDH - 501'	1970	T-1134
Area of Squirrel River	Keevil Mining Group Ltd.		5 DDH - 3495'	1969	T-381
Area of Sutton Narrows	R. Campbell, 12 Richmond St.E., Toronto 1, Ont.		Geol.	1969	T-1115
Thorburn Tp.	Hollinger Mines Ltd.		AEM - Input	1970	T-681
Thorburn Tp.	Hollinger Mines Ltd.		1 DDH - 540'	1970	T-1434
Tully Tp.	Noranda Exploration Co. Ltd.		Mag., VEM	1969	T-1346
Tully Tp.	Noranda Exploration Co. Ltd.		VEM	1969	T-1270
Tully Tp.	Noranda Exploration Co. Ltd.		Mag., VEM	1969	T-1269
Tully Tp.	Cincinnati-Porcupine Mines Ltd.		3 DDH-2783'	1969	T-1469
Tully Tp.	Noranda Exploration Co. Ltd.	Minor cp; trace sp, asp	Mag., VEM, 2 DDH-970'	1969	T-1229
Tully Tp.	Noranda Exploration Co. Ltd.		Mag., VEM	1969	T-1268
Tully Tp.	Noranda Exploration Co. Ltd.		Mag., VEM	1969	T-1215
Tully Tp.	McIntyre Porcupine Mines Ltd.		1 DDH - 655'	1969	T-1179
Tully Tp.	Texmont Mines Ltd.		Mag., VEM	1969	T-1448
Tully Tp.	Laroma Midlothian Mines Ltd.		Mag., VEM	1970	T-667

Location	Ownership	Commodity Found	Type of Work	Year	File No.
Tully Tp.	Hollinger Mines Limited	Trace cp.	3 DDH - 1508'	1970	T-681
Turnbull Tp.	Mespi Mines Limited		VEM	1969	T-882
Turnbull Tp.	W.Martin,224 Toke St.,Timmins	Trace cp.	2 DDH - 140'	1970	T-1073
Turnbull Tp.	Noranda Exploration Co.	Trace cp.	1 DDH - 504'	1970	T-1451
Valentine Tp.	Coral Lime & Chem. Ltd.		Geol, pits, gravel sampling	1969	T-658
Wark Tp.	Noranda Exploration Co. Ltd.		Geol.	1969	T-1456
Wark Tp.	R.C.Denomme, 387 Brousseau Ave., Timmins, Ont.		VEM	1970	T-733
Wark Tp.	Falconbridge Nickel Mines Ltd.		Mag., VEM	1970	T-1161
Wark Tp.	Hollinger Mines Ltd.		Mag., EM-16, Radem	1970	T-688
Wataibei River, East part	Satellite Metal Mines Ltd.		Mag.	1968	T-333
Wataibei River, East part	Keevil Mining Group Ltd.		3 DDH-2378'	1969	T-325
Way Tp.	Algoma Central Railway		Mag., EM	1963	T-374
Way Tp.	Algoma Central Railway		AEM	1961	T-372
Way Tp.	Algoma Central Railway		VEM, HEM, Mag. 1 DDH-260'	1961	T-373
Way Tp.	E.O.Hillman, c/o The Algoma Steel Corp. Ltd., 503 Queen St.E.,Sault Ste. Marie, Ont.		2 DDH-205'	1969	T-361
Whitney Tp.	Oro Mines Ltd.	Minor Mag. Tr. cp.	AEM, VEM, AMag., Mag., 5 DDH - 3649'	69-70	T-1152
Whitney Tp.	J.H.Dillon, Suite 103,17 Ave.of Americas,N.Y.,N.Y. & B.M.Young, 80 Richmond St., Toronto,Ont.		Trenching	1970	T-518
Whitney Tp.	Noranda Exploration Co. Ltd.	Trace cp.	1 DDH - 503'	1970	T-1487

Kam-Kotia Mines Ltd.
McIntyre Exploration Ltd.
Newmont Exploration Ltd.
Noranda Exploration Ltd.
Texas Gulf Sulphur Exploration Ltd.

In addition to the activities of numerous major mining concerns, a revival of prospecting activity occurred during 1970 particularly in those areas to the south and west of Timmins. J. Larche and F. Rousseau re-examined several old and discovered several new showings of zinc, lead, and copper in the rhyolitic rocks of Halliday and Midlothian Townships. W. Dallaire and R. Rochon discovered a new showing of disseminated chalcopyrite in amygdaloidal andesite in Zavitz Township south of Timmins. A revival of activity took place in the Chapleau-Foleyet volcanic belt when prospectors opened up a disseminated zone of chalcopyrite in meta-iron formation in Muskego Township. A previously reported occurrence of antimony in Reeves Township was opened up by J. Johnson. His work revealed a fracture-filled zone at least 180 feet long and 4 feet wide of disseminated to massive (berthierite) iron-antimony sulphide with associated arsenopyrite. Mr. Johnson also discovered a new occurrence of nickel and copper in a gabbro-pyroxenite-peridotite intrusive body north of Weston Lake in Sewell Township.

LIST OF NEW PUBLICATIONS

Bright, E.G.
1970a: Annual Report of Resident Geologists' Section, Timmins District; Ontario Dept. Mines, MP35.
1970b: Geology of Halliday and Midlothian Townships; Ontario Dept. Mines, GR79.
1970c: Operation Pamour, District of Cochrane, in Summary of Field Work, 1970, by the Geological Branch, edited by E.G. Pye; Ontario Dept. Mines and Northern Affairs, MP43, p.71-72.

Cameron, E.M., et al.
1970: Distribution of ore elements in rocks for evaluating ore potential: nickel, copper, cobalt and sulphur in ultramafic rocks of the Canadian Shield; paper presented at 1970 CIMM Convention.

Middleton, R.S.
1970a: Magnetic survey of Loveland and MacDiarmid Townships, in Summary of Field Work, 1970; Ontario Dept. Mines and Northern Affairs, MP43, p.68-71.
1970b: Gravity survey in northeastern Ontario, in Summary of Field Work, 1970; Ontario Dept. Mines and Northern Affairs, MP43, p.67.
1970c: Airborne geophysical surveys in northern and southern Ontario, in Summary of Field Work, 1970; Ontario Dept. Mines and Northern Affairs, MP43, p.72.

Pye, E.G.
1970: Current activities and trends in exploration in Ontario; Ontario Dept. Mines, MP37.

Pyke, D.R.
1970a: Geology of Langmuir and Blackstock Townships; Ontario Dept. Mines, GR86.
1970b: Geology of McArthur and Douglas Townships, in Summary of Field Work, 1970; Ontario Dept. Mines and Northern Affairs, MP43, p.76-79.

Pyke, D.R., and Middleton, R.S.
1970: Distribution and characteristics of the sulphide ores of the Timmins area; Ontario Dept. Mines, MP41.

Wolfe, W.J.
1970: Distribution of copper, nickel, cobalt and sulphur in mafic intrusive rocks of the Kamiskotia-Whitesides area; Ontario Dept. Mines and Northern Affairs, MP44.