Ontario

Ministry of Northern Development and Mines

Mines and Minerals Division

ONTARIO GEOLOGICAL SURVEY

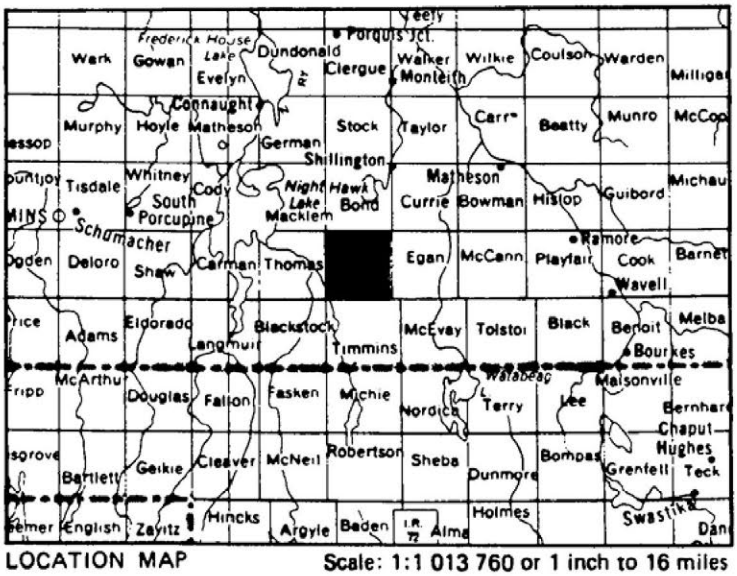
GEOLOGICAL DATA INVENTORY FOLIO

GDIF 402

SHERATON TOWNSHIP

DISTRICT OF COCHRANE

Compiled by the Staff of
the Resident Geologist's Office
Kirkland Lake



LOCATION MAP

Scale: 1:1 013 760 or 1 inch to 16 miles

NTS Number 42A/07

Mining Claim Map Number

This project is part of Operation Black River-Matheson (BRIM) which was funded equally by the Ontario Ministry of Northern Development and Mines and the Ontario Ministry of Natural Resources.

Original Compilation by: Uttam Kalicharran

Date	Page Revised	Revised by

Date	Page Revised	Revised by

SHERATON TOWNSHIP

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ACCOMPANYING MAPS

CONVERSION FACTORS FOR MEASUREMENTS IN ONTARIO GEOLOGICAL SURVEY PUBLICATIONS

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

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

OTHER USEFUL CONVERSION FACTORS

1 ounce (troy)/ton (short)	20.0	pennyweights/ton (short)
1 pennyweight/ton (short)	0.05	ounce (troy)/ton (short)

One gram(g) per tonne is equivalent to one part per million (1 ppm).

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

DATA SOURCES CHECK LIST

NOTE: The following sources have been searched to compile the data for this area. If no reference data was found the appropriate box is marked 'no'; if reference data was found, the box is marked 'yes'.

All reference data found are included in the following pages. If the box is blank, the data source has not yet been searched. If the box is marked N.A., the source item is Not Applicable to this area and therefore not searched.

	SOURCES OF DATA	Data	Initial
1	Resident Geologist's Office Files	YES	U.K.
2	Assessment Files Research Office, Toronto	NO	U.K.
3	ODM General Index; 9 volumes	YES	D.M.
4	Catalogue of Airborne Geophysical Surveys (ODM)	-	-
5	ODM Mineral Resources Circulars and OGS Mineral Deposits Circulars	NO	U.K.
6	ODM Industrial Mineral Reports	NO	U.K.
7	Bibliography of Post Precambrian Theses - Karrow (ODM MP 1)	NO	U.K.
8	Bibliography of Precambrian Theses - Ginn (ODM MP 2)	NO	U.K.
9	Newspaper Clippings File	NO	U.K.
10	GSC Index to Publications	YES	U.K.
11	OGS Index to Published Maps and Reports - MP 77 and Supplements to MP 77	YES	U.K.
12	OGS Index Maps	YES	U.K.
13	Source Mineral Deposit Records (O.G.S.)	YES	U.K.
14	Author - Subject Articles File	YES	U.K.
15	Miscellaneous Papers: ODM & OGS	YES	U.K.
16	ODM Geological Circulars OGS Study Series	NO	U.K.
17	ODM Preliminary Reports: ODM Bulletins	YES	U.K.
18	ODM – OGS Open File Reports	YES	U.K.
19	OGS Northern Ontario Engineering Geology Terrain Studies	NO	U.K.
20	OGS Aggregate Resources Inventory Papers	NO	U.K.
21	OGS Mineral Potential Maps	YES	U.K.

METALS AND MINERALS REFERENCES LIST

- △ anh . . . . . Anhydrite
- △ ank . . . . . Ankerite
- △ anna . . . . . Annabergite
- △ ap. . . . . Apatite
- △ arg . . . . . Argentite
- △ As . . . . . Arsenic
- △ asp . . . . . Arsenopyrite
- △ asb . . . . . Asbestos
- △ ba. . . . . Barite
- △ be. . . . . Beryl
- △ Bi. . . . . Bismuth
- △ bn . . . . . Bornite
- △ bran . . . . . Brannerite
- △ bruc . . . . . Brucite
- △ Cd . . . . . Cadmium
- △ calc. . . . . Calcite
- △ carb . . . . . Carbonate
- △ cel . . . . . Celestite
- △ cc. . . . . Chalcocite
- △ cp. . . . . Chalcopyrite
- △ ch. . . . . Chert
- △ clay . . . . . Clay
- △ Co . . . . . Cobalt
- △ cob. . . . . Cobaltite
- △ cb. . . . . Columbite
- △ Cu . . . . . Copper
- △ cor . . . . . Corundum
- △ dol . . . . . Dolomite
- △ ep. . . . . Epidote
- △ ery . . . . . Erythrite
- △ fel . . . . . Feldspar
- △ fl . . . . . Fluorite (fluorspar)
- △ fu. . . . . Fuchsite
- △ gn. . . . . Galena
- △ gt . . . . . Garnet
- △ goe . . . . . Goethite
- ▲ Au . . . . . Gold
- △ gf. . . . . Graphite
- △ gl . . . . . Gravel
- △ gyp. . . . . Gypsum
- △ hem . . . . . Hematite
- △ il . . . . . Ilmenite
- △ Fe . . . . . Iron
- △ IF. . . . . Iron Formation
- △ jas . . . . . Jasper
- △ kaol . . . . . Kaolinite (kaolin)
- △ ky . . . . . Kyanite
- △ Pb . . . . . Lead
- △ lim . . . . . Limonite
- △ Li. . . . . Lithium
- △ mgst . . . . . Magnesite
- △ mag . . . . . Magnetite
- △ mc . . . . . Malachite
- △ Mn . . . . . Manganese
- △ mb . . . . . Marble
- △ mar. . . . . Marcasite
- △ ma . . . . . Marl
- △ mi . . . . . Mica
- △ ml . . . . . Millerite
- △ mo . . . . . Molybdenite
- △ Mo . . . . . Molybdenum
- △ mon . . . . . Monazite
- △ ne. . . . . Nephelite (nepheline)
- △ nc. . . . . Niccolite
- △ Ni. . . . . Nickel
- △ Nb . . . . . Niobium
- △ Pd . . . . . Palladium
- △ peat . . . . . Peat
- △ pent . . . . . Pentlandite
- △ Pt. . . . . Platinum
- △ py . . . . . Pyrite
- △ pyl . . . . . Pyrochlore
- △ pyrl . . . . . Pyrolusite
- △ po . . . . . Pyrrhotite
- △ q . . . . . Quartz
- △ qcv . . . . Quartz carbonate vein
- △ ra. . . . . Radioactive minerals
- △ RE . . . . . Rare Earths
- △ sd. . . . . Sand
- △ sgl . . . . . Sand and gravel
- △ ss . . . . . Sandstone
- △ scap . . . . . Scapolite
- △ shee . . . . . Scheelite
- △ serp . . . . . Serpentine
- △ sh. . . . . Shale
- △ sid . . . . . Siderite
- △ si . . . . . Silica
- △ Ag . . . . . Silver
- △ sl . . . . . Slate
- △ sm . . . . . Smaltite
- △ sod . . . . . Sodalite
- △ spec . . . . . Specularite
- △ sp. . . . . Sphalerite
- △ spd . . . . . Spodumene
- △ staur . . . . . Staurolite
- △ stib. . . . . Stibnite
- △ st . . . . . Stone
- △ talc. . . . . Talc
- △ Te . . . . . Tellurium
- △ td. . . . . Tetrahedrite
- △ th. . . . . Thorite
- △ Th . . . . . Thorium
- △ thuc . . . . . Thucholite
- △ ti . . . . . Titanite
- △ Ti. . . . . Titanium
- △ tour . . . . . Tourmaline
- △ trap . . . . . Trap rock
- △ W . . . . . Tungsten
- △ uran . . . . . Uraninite
- △ U . . . . . Uranium
- △ verm . . . . . Vermiculite
- △ Y . . . . . Yttrium
- △ Zn . . . . . Zinc
- △ zr . . . . . Zircon

Solid triangles indicate metal and mineral occurrences shown on the accompanying maps.

MINERAL OCCURRENCES

Map Ref. Letter	Name(s)	Mineralization	Source Mineral Deposit Record	References in OGS Mineral Deposits Circulars & OGS Industrial Mineral Reports	Additional References and/or Remarks
A	Card Lake Copper Mines Ltd. (T-213)	Au	-	Resident Geologist Assessment Files Timmins	DDH #2 (1)* 0.01oz/T Au over 1 ft.
B	Roy, J.P.	Au	C0236	Resident Geologist Assessment Files Timmins ODM 1940,vol.49,pt.4 pg.12 ODM 1969,OFR 5037 p.52 OGS 1971,MRC 13 pg.136 NMI File, 42A/07 ZN 1	Grab sample 0.37oz/T Au Grab sample 0.069oz/T Au Grab sample 0.13oz/T Au Mafic volcanic rocks and fragmental rocks are cut by porphyry dikes and by diabase. Quartz stringers and adjacent wallrock are mineralized with pyrite and a picked sample assayed 0.32oz/T Au.
C	Selco Explorations Co. Ltd. (T-1339)	Au	-	Resident Geologist Assessment Files Timmins	DDH #9 (31) 0.01oz/T Au over 6 ft.
D	Armont Occurrence	Au	-	ODM 1940,vol.49, pt.4,p.11 ODM 1969, OFR 5037 p.52 OGS 1971,MRC 13 p.136	Quartz vein in Keewatin basalts and fragmental rocks is up to 1 foot wide and extends for 700 feet. 1935 - Some drilling by Goward Gold Mines Ltd. 1936 - Held by Armont Gold Mines Ltd.

*Number in brackets from Drillhole Summary sheets (pages 7-9)

TYPE OF WORK		Numbers below represent the year in which the work was done; e.g., 68 for 1968.																		
EXPLORATION DATA filed at the RESIDENT GEOLOGIST'S OFFICE TIMMINS COMPANY/AUTHOR (file number)		GEOLOGICAL	GEOCHEMICAL	TRENCHING, STRIPPING	DRILLING	ASSAY DATA	UNDERGROUND WORK	PROSPECTUS, NOTES, CORRESPONDENCE	AIRBORNE MAGNETOMETER	AIRBORNE ELECTROMAGNETIC	AIRBORNE RADIOMETRIC	GROUND MAGNETOMETER	GROUND ELECTROMAGNETIC	GROUND RADIOMETRIC	INDUCED POLARIZATON	SELF POTENTIAL	RESISTIVITY	PLUGGER		
1	Bellechasse Mining Corp. Ltd. (T-704)	68		68								68	68							
2	Butler Claims (T-185)	47																		
3	Card Lake Copper Mines Limited (T-213)				72															
4	Cominco Limited (T-341)				71				71											
5	Cominco Limited (T-650)				74				71 72	71 72		71	73 71							
6	Johns Manville Canada Inc. (T-1856)	84										81	81	84				83		
7	Ingamar Exploration Ltd. (T-1878)										76									
8	Jarvi, Reino Property (T-664)				72															
9	Johns-Manville Canada Inc. (T-2542)											81	81							

GDIF FORM NO. 2

TYPE OF WORK		Numbers below represent the year in which the work was done; e.g., 68 for 1968.																		
EXPLORATION DATA filed at the RESIDENT GEOLOGIST'S OFFICE TIMMINS		GEOLOGICAL	GEOCHEMICAL	TRENCHING, STRIPPING	DRILLING	ASSAY DATA	UNDERGROUND WORK	PROSPECTUS, NOTES, CORRESPONDENCE	AIRBORNE MAGNETOMETER	AIRBORNE ELECTROMAGNETIC	AIRBORNE RADIOMETRIC	GROUND MAGNETOMETER	GROUND ELECTROMAGNETIC	GROUND RADIOMETRIC	INDUCED POLARIZATON	SELF POTENTIAL	RESISTIVITY			
COMPANY/AUTHOR (file number)																				
10	Kam-Kotia Mines Limited (T-1010)				64 65 67	67						65 66	65 66 67							
11	Lac Minerals (T-3002)				85 86							85 86								
12	Noranda Exploration Co. Ltd. (T-1816)											77	77							
13	Ontario Paper Co. Ltd. & Geomont Exploration Co. Ltd. (T-1745)	75										75			75					
14	Papont Resources Inc. (T-2820)	83										83	83							
15	Republic Ores & Mining Corp. Ltd. (T-400)				72			71				71	71							
16	Roy, J.P. (T-753)	38		38		38														
17	Selco Exploration Co. Ltd. (T-1339)				66															

GDIF FORM NO. 2

xx - Date unknown

TYPE OF WORK		Numbers below represent the year in which the work was done; e.g., 68 for 1968.																		
EXPLORATION DATA filed at the RESIDENT GEOLOGIST'S OFFICE TIMMINS COMPANY/AUTHOR (file number)		GEOLOGICAL	GEOCHEMICAL	TRENCHING, STRIPPING	DRILLING	ASSAY DATA	UNDERGROUND WORK	PROSPECTUS, NOTES, CORRESPONDENCE	AIRBORNE MAGNETOMETER	AIRBORNE ELECTROMAGNETIC	AIRBORNE RADIOMETRIC	GROUND MAGNETOMETER	GROUND ELECTROMAGNETIC	GROUND RADIOMETRIC	INDUCED POLARIZATON	SELF POTENTIAL	RESISTIVITY			
18	Stairs Claims (T-179)				60 61															
19	Sumach Resources Inc. (T-3018)								85	85										

GDIF FORM NO. 2

xx - Date unknown

DRILLHOLE SUMMARY

Map Drilling Location Number	Company Name	Company Drillhole Number	Date Drilled	Bearing Azimuth	Initial Dip of Hole	Thickness of Overburden *	Total Length of Hole	Mineralization Noted in Log	Assay Data Included for
1	Card Lake Copper Mines Ltd. (T-213)	2	9/72	220°	-50°	125'	452'	qcv,py,po,q	Au,Cu,Zn
2	" "	1	7/72	-	-90°	86'	102'	py,po,cp	-
3	Cominco Limited (T-341)	R-1	8/71	360°	-45°	188'	505'	py,gf	-
4	Cominco Limited (T-650)	RA-2	7/74	-	-130°	244'	244'	abandoned	-
5	" "	RA-2A	7/74	-	-115°	220'	553'	py,gf,qcv carb,cp	-
6	Jarvi, Reino Property (T-664)	2	9/72	270°	-50°	125'	201'	qcv,py,po,q	-
7	Kam-Kotia Mines Ltd. (T-1010)	S-1	12/64	8°	-50°	4'	249'	py,cp	-
8	" "	S-2	12/64	354°	-50°	3'	380'	py,q,calc po,qcv,cp	-
9	" "	S-3	1/65	30°	-50°	130'	303'	py,po,cp	-
10	" "	S-4	1/65	30°	-50°	27'	262'	py,carb,po qcv,cp	-
11	" "	S-5	1/65	30°	-50°	24'	187'	cp,qcv,py	-
12	" "	S-6-1	1/65	30°	-50°	30'	70'	cp	-
13	" "	S-6-2	1/65	30°	-50°	68'	68'	abandoned	

* - Length of overburden down drillhole
? - Location unknown
** - No drill logs
† - Core stored at Swastika Core Storage Library
xx - No date
++ - From till heavy mineral concentrates

DRILLHOLE SUMMARY

Map Drilling Location Number	Company Name	Company Drillhole Number	Date Drilled	Bearing Azimuth	Initial Dip of Hole	Thickness of Overburden *	Total Length of Hole	Mineralization Noted in Log	Assay Data Included for
14	Kam-Kotia Mines Ltd. (T-1010)	S-7	1/65	30°	-50°	16'	238'	py,po,cp carb	-
15	" "	S-8	2/65	-	-90°	4'	57'	-	-
16	" "	S-9	2/65	30°	-50°	14'	302'	py,qcv	-
17	" "	S-10	2/65	30°	-50°	10'	35'	-	-
18	" "	S-11	2/65	354°	-50°	3'	307'	py,cp	-
19	" "	S-12	2/65	30°	-50°	152'	162'	-	-
20	" "	S-13	3/65	30°	-50°	100'	350'	qcv	-
21	" "	S-14	7/65	30°	-45°	31'	400'	qcv,py,carb	-
22	" "	S-15	7/65	210°	-45°	-	184'	carb,py	-
23	" "	2	3/67	90°	-50°	123'	424'	py,mag,sp cp,qcv	Au,Ag,Cu Ni,Zn
24	" "	1	2/67	270°	-50°	149'	606'	cp,carb,py gf,mag,qcv,q	Au,Ag,Cu Ni,Zn
25	Lac Minerals (T-3002)	Sh-5-A	11/85	-	-90°	180'	626'	mag,carb py,q,qcv	-
26	" "	Sh-3-B	1/86	-	-90°	218'	687'	mag,q	-
27	" "	Sh-14-A	2/86	270°	-65°	156'	807'	py,calc,q qcv,hem	-

* - Length of overburden down drillhole
? - Location unknown
** - No drill logs
† - Core stored at Swastika Core Storage Library
xx - No date
++ - From till heavy mineral concentrates

DRILLHOLE SUMMARY

Map Drilling Location Number	Company Name	Company Drillhole Number	Date Drilled	Bearing Azimuth	Initial Dip of Hole	Thickness of Overburden *	Total Length of Hole	Mineralization Noted in Log	Assay Data Included for
28	Lac Minerals (T-3002)	Sh-4-A	11/85	270°	-65°	252'	757'	py,qcv,carb calc	-
29	" "	Sh-Tr-1	1/86	360°	-65°	392'	987'	calc,q	-
30	Republic Ores & Mining Corp. Ltd. (T-400)	72-6	4/72	-	-60°	65'	576'	py,serp,qcv	-
31	Selco Exploration Co. Ltd. (T-1339)	9	1966	330°	-50°	135'	357'	py,cp	Au,Ag
32	Stairs Claims (T-179)	1	11/60	310°	-90°	12'	454'	py,q	-
33	" "	2	12/60	310°	-50°	21'	502'	py,cp qcv,q	-
34	" "	3	12/60	310°	-50°	29'	407'	qcv,py mag,q	-
35	" "	4	12/60	310°	-50°	24'	403'	qcv,py,q	-
36	" "	5	1/61	310°	-54°	48'	400'	py,qcv q,cp	-

* - Length of overburden down drillhole
? - Location unknown
** - No drill logs
† - Core stored at Swastika Core Storage Library
xx - No date
++ - From till heavy mineral concentrates

AIRBORNE GEOPHYSICAL SURVEY DATA

No.	By / For	Type of Survey	Flight Altitude	Flight Line Direction	Flight Line Spacing
4	Dighem Ltd. Cominco Ltd. (T-341)	Magnetic	200'	N-S	1/8 & 1/4mi.
5	Dighem Ltd. Cominco Ltd. (T-650)	Magnetic	200 plane 170 bird	N-S	1/8 mi.
		Electromagnetic	140'		
	Geoterrex Ltd. Cominco Ltd. (T-650)	Magnetic Electromagnetic	150'	N-S	1/8 mi.
7	Ingamar Exploration Ltd. (T-1878) Ingamar Exploration Ltd.	Radiometric	200'	N-S	1/8 mi.
19	H. Ferderber Geophysics Sumach Resources Inc.	Magnetic Electromagnetic	250'	N-S	1/12 mi.

SHERATON TOWNSHIP

Map Sample Site Reference Number	GEOCHEMICAL SURVEY DATA		By	Reference
	Type of Survey	Analysis For		

GDIF FORM NO. 5

MISCELLANEOUS DATA

AGE DATING

Site	Method	Material	Reference	Result

Aerial Photographs

Black and White scale 1:1/4 mile
scale 1:1 mile

Landsat Data scale 1:500,000

Band 3 , 9/5/83
Band 4 , 31/2/83
Bands 1+2+4 , 2/10/83
Bands 1+2+4 , 9/5/83

GDIF FORM NO.6

NEWSPAPER CLIPPINGS FILE

NOTE: A file of newspaper clippings about the companies listed below, who have worked in this area, is maintained in the Regional/Resident Geologist's Office.

Kirkland Lake

Bellechase Mining Corp.

Nov 14, ?

QC Explorations

The Northern Miner — Jun 06, 1975 — Jun 06, 1975

GDIF FORM NO. 7

ODM GENERAL INDEX SEARCH

Words searched:
Sheraton Township

Index Volume	Listing:	Report Volume	Part	Page
2	Sheraton Tp., Coch.			
	Agricultural area; character of country	31	7	6,28
	Gold discoveries	31	1	52
	Map Geological	34	7	4
	see also map 31d with	31	7	
3	Sheraton Tp., Coch.			
	Gold m.g. properties	49	4	11,28,18
	Photo frontis	49	4	
	Rocks, notes and photo	49	4	4,5,7,8
	Timber	49	4	3
9	Sheraton Tp., Coch.			
	Copper float	MDC 017		77
	Gravity Survey of Tim-Matheson area	GR 135		

GDIF FORM NO. 8

ODM GENERAL INDEX SEARCH

Words searched

Index Volume	Listing:	Report Volume	Part	Page

GDIF FORM NO. 8

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
		REGIONAL GEOLOGICAL COMPILATION MAPS		
Ayers, L.D. Lumbers, S.B. Milne, V.G. Robeson, D.W.	1970	Ontario Geological Map	ODMNA Map 2196	1:1 013 760
Ayers, L.D. Lumbers, S.B. Milne, V.G. Robeson, D.W.	1971	Ontario Geological Map, East Central Sheet	ODMNA Map 2198	1:1 013 760
Boissoneau, A.N.	1965	Algoma-Cochrane Surficial Geology, Ontario	ODL & F Map S365	1:506 880
Card, K.D. Sanford, B.V.	1983	Geology of the Timmins Map Sheet (NM-17)	GSC OF 956	1:1 000 000
Easton, R.M.	1986	Geochronology Compilation Map for Ontario: Sheet 3: East-Central Ontario, All Isotopic Systems	OGS Map P.2842	1:1 013 760
Ginn, R.M.	1964	Timmins-Kirkland Lake Sheet, Cochrane, Sudbury and Timiskaming Dists., Ont. Geol. Compilation Series	ODM Map 2046	1:253 440
Gordon, J.B.	1977	Gold Deposits of Ontario, East Central Sheet	OGS Map P.1228	1:1 013 760
Gordon, J.B.	1980	Vein Silver Deposits of Ontario, East Central Sheet	OGS Map P.2300	1:1 013 760
Guillet, G.R.	1977	Clay and Shale Deposits of Ontario	OGS Map 2358 (MDC 15)	1:200 000

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
Jost, M.	1977	Nickel Deposits of Ontario, East Central Sheet	OGS Map P.1062	1:1 013 760
Lumbers, S.B. Milne, V.G.	1979	Ontario Geological Map, Explanatory Text, Legend and Diagrams of Major Lithologies, Structures and Zones of Metamorphism	OGS Map 2391	1:1 013 760
Lumbers, S.B. Milne, V.G.	1979	Ontario Geological Map, East Central Sheet	OGS Map 2393	1:1 013 760
McCrank, G.F. Brown, P.A. Misiura, J.D.	1980	Plutonic Rocks in Ontario, with map.	GSC OFR 706	
MERQ-OGS	1984	Lithostratigraphic Map of the Abitibi Subprovince	OGS Map 2484 Que Map DV83-16	1:500 000
Meyn, H.D. Howarth, J.R.	1977	Molybdenum Deposits of Ontario, East Central Sheet	OGS Map P.1246	1:1 013 760
Meyn, H.D. Robertson, J.A.	1975	Iron Deposits of Ontario, East Central Sheet, Districts of Thunder Bay, Algoma, Cochrane, Sudbury, Timiskaming and Nipissing	ODM Map P.1043	1:1 013 760
Ministry of Natural Resources	1985	Ontario Mineral Map	ODM Map 2472	1:1 584 000
Minnes, D.G. Masham, J.S. Scott, D.W. Vos, M.A. & Yundt, S.E.	1983	Industrial Minerals of Ontario	OGS Map P.2591	1:1 500 000
ODM	1969	Mining Divisions and Resident Geologists Districts	ODM Map 2189	1:1 584 000
ODM	1974	Ontario Mineral Map	ODM Map 2310	1:1 584 000

GDIF FORM NO.9

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
ODM	1977	Ontario Geology and Principal Minerals	ODM Map 2389 (Rev.)	1:4 224 000
ODMNA	1971	Ontario Geology and Principal Mineral Collecting Localities, Discover Ontario	ODMNA Map 2211	1:4 224 000
OGS	1986	Geological Highway Map, Northern Ontario	OGS Map 2506	1:1 600 000
Pyke, D.R., Ayres,L.D. Innes, D.G.	1973	Timmins - Kirkland Lake, Geological Compilation Series, Cochrane, Sudbury and Timiskaming Districts	ODM Map 2205	1:253 440
Robertson, J.A.	1976	Mineral Potential Map of Ontario, East Central Sheet	ODM Map P.1099	1:1 013 760
Robertson, J.A.	1982	Uranium and Thorium Deposits of Ontario, East Central Sheet, NTS 31/NW, 32/W, 41/N, 42	OGS Map P.2426	1:1 013 760
Springer, J.	1977	Ontario Mineral Potential, Timmins Sheet and Part of Noranda-Rouyn Sheet, Districts of Sudbury, Timiskaming and Cochrane	OGS Map P.1517	1:250 000
		GEOPHYSICAL MAPS		
Data Plotting Services Inc.	1984	Matheson-Black River Area (BRIM) Magnetic Survey Total Field, based on Airborne Electromagnetic and Total Intensity Magnetic Survey, Matheson-Black River Area, by Questor Surveys Ltd. for the OGS. (1984)	MNDM Resident Geologist's Office, Kirkland Lake, Ontario	1:80 000
Data Plotting Services Inc.	1985	Matheson-Black River Area (BRIM) Airborne Magnetic Survey Second Vertical Derivative based on Airborne Electromagnetic and Total Intensity Magnetic Survey, Matheson-Black River Area, by Questor Surveys Ltd. for the OGS. (1984)	MNDM Resident Geologist's Office, Kirkland Lake, Ontario	1:100 000

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
Dighem Surveys and Processing Inc.	1986	"Enhanced Shadow" Magnetics, Black River-Matheson Area (BRIM) based on Airborne Electromagnetic and Total Intensity Magnetic Survey, Matheson-Black River Area, by Questor Surveys Ltd. for the OGS. (1984)	MNDM Resident Geologist's Office, Kirkland Lake, Ontario	1:100 000
GSC	1970	Watabeag River, Ontario. Aeromagnetic Series	GSC Map 294G (Rev.)	1:50 000
GSC	1970	Timmins, Cochrane, Timiskaming and Sudbury Districts, Ontario, Total Field Contour Map	GSC Map 7085G	1:250 000
GSC	1970	Watabeag River, Timiskaming and Cochrane Districts	GSC Map 8438G	1:31 680
GSC	1970	Watabeag River, Cochrane and Timiskaming Districts	GSC Map 8443G	1:31 680
ODMNA	1974	Aeromagnetic Index of Ontario	ODMNA Map 2229	1:1 900 800
OGS	1984	Airborne Electromagnetic and Total Intensity Magnetic Survey, Matheson-Black River Area, Sheraton Township	OGS Map 80 602	1:20 000 1:31 680
OGS-GSC	1979	Airborne Gamma-Ray Spectrometric Total Count, Timmins, NTS 42A	OGS Map 80 280 GSC Map 35142G	1:250 000
OGS-GSC	1979	Airborne Gamma-Ray Spectrometric Potassium (percent), Timmins, NTS 42A	OGS Map 80 281 GSC Map 35142G	1:250 000
OGS-GSC	1979	Airborne Gamma-Ray Spectrometric Uranium (eU), Timmins, NTS 42A	OGS Map 80 282 GSC Map 35142G	1:250 000
OGS-GSC	1979	Airborne Gamma-Ray Spectrometric Thorium (eTh), Timmins, NTS 42A	OGS Map 80 283 GSC Map 35142G	1:250 000

GDIF FORM NO. 9

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
OGS-GSC	1979	Airborne Gamma-Ray Spectrometric eU/Th Ratio, Timmins, NTS 42A	OGS Map 80 284 GSC Map 35142G	1:250 000
OGS-GSC	1979	Airborne Gamma-Ray Spectrometric eU/K Ratio, Timmins NTS 42A	OGS Map 80 285 GSC Map 35142G	1:250 000
OGS-GSC	1979	Airborne Gamma-Ray Spectrometric eTh/K Ratio, Timmins, NTS 42A	OGS Map 80 286 GSC Map 35142G	1:250 000
OGS-GSC	1979	Airborne Gamma-Ray Spectrometric Profiles of Integral U, K, Th, U/Th, U/K, Th/K, for line 51 (1), Timmins, NTS 42A	OGS Map 80 306 GSC Map 35142G	1:250 000
OGS-GSC	1979	Airborne Gamma-Ray Spectrometric Profiles of Integral U, K, Th, U/Th, U/K, Th/K, for line 52 (1), NTS 42A	OGS Map 80 307 GSC Map 35142G	1:250 000
		GEOLOGICAL MAPS AND REPORTS		
Averill, S.A. MacNeil, K.A. Huneault, R.G. Baker, C.L.	1986	Rotasonic Drilling Operations (1984) and Overburden Heavy Mineral Studies, Matheson Area, District of Cochrane	OGS OFR 5569	61p.
Baker, C.L.	1985	Overburden Stratigraphy of the Matheson Area: Advancing Thoughts on Ice Fronts (Abstract)	OGS Geo.Sci. Seminar & Open House '85	p.9
Baker, C.L. Steele, K.G.	1984	Sonic Drilling-Exploration Basics in the Matheson Area (Abstract)	OGS Geo. Sci. Seminar & Open House '85	p.23

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
Baker, C.L. Steele, K.G. Fortescue, J.A.C.	1984	Reconnaissance Till Sampling Program in the Matheson Area, District of Cochrane	OGS MP 119	p.295-298
Baker, C.L. Steele, K.G. McClenaghan, M.B.	1986	Gold Grains in Sonic Drill Core Samples (1985) from the Lake Abitibi-Matheson Area, District of Cochrane	OGS Map P.2958	1:100 000
Barlow, R.B. Pitcher, D.H.	1984	An Airborne Electromagnetic-Magnetic Survey of the Black River-Matheson (BRIM) Area, District of Cochrane	OGS MP 119	p.287-289
Bath, A.C.	1985	Black River-Matheson Economic Geologist Program	OGS MP 126	p.301-311
Bath, A.C.	1985	Black River-Matheson Economic Geologist Program (Abstract)	OGS Geo. Sci. Seminar & Open House '85	p.8
Bath, A.C.	1986	Black River-Matheson Economic Geologist Program	OGS MP 132	p.421-430
Berry, L.G.	1940	Geology of the Langmuir-Sheraton Area	ODM AR v.49, pt.4	21p.
Berry, L.G.	1942	Langmuir-Sheraton Area, Districts of Cochrane and Timiskaming	ODM Map 49h	1:63 760
Ferguson, S.A. Freeman, E.B.	1978	Ontario Occurrences of Float, Placer Gold and Other Heavy Minerals	OGS Min. Deposit Circ. 17	214p.
Ferguson, S.A. Groen, H.A. Haynes, R.	1971	Gold Deposits of Ontario	ODM Min. Res. Circ. 13, pt.1	315p.
Fortescue, J.A.C.	1984	Summary of Activities 1984, BRIM Program	OGS MP 119	p.274-277

GDIF FORM NO.9

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
Ginn, R.M. Leahy, E.J. Savage, W.S.	1962	Matheson-Black Sheet, District of Cochrane	ODM Map P.119	1:63 760
Gleeson, C.F. Hornbrook, E.H.W.	1973	Moving Average - Residual Anomaly Maps Showing Distribution of Elements in Lake Bottom Sediments in the Timmins-Val d"Or Region	GSC OF 127	
GSC	1981	Magnetic Anomaly Map, Timiskaming-Kapuskasing Region	GSC Map 1563A	1:1 000 000
Guillet, R.	1969	Ontario Marl Deposits	ODM Map 2183	1:1 013 760
Hewitt, D.F. Vos, M.A.	1972	Ontario Limestone Quarries, 1971	ODM Map 2264 (Rev.)	1:1 013 760
Hodgson, C.J.	1983	Preliminary Report on the Timmins-Kirkland Lake Area Gold Deposits File	OGS OFR 5467	434p.
Hornbrook, E.H.W. Gleeson, C.F.	1983	Regional Geochemical Lake Bottom Sediment and Till Sampling in the Timmins-Val d"Or Region of Ontario and Quebec	GSC OF 112	
Hughes, O.L.	1960	Surficial Geology of Kirkland Lake, Timiskaming and Cochrane Districts, Ontario	GSC Map 1-1960	1"=2mi.
Hughes, O.L.	1965	Surficial Geology of Part of the Cochrane District, Ontario, Canada	Geol. Soc. of America Spec. Paper 84	
Hunt, D.S. Maharaj, D.	1980	Sheraton Township, District of Cochrane	OGS Map P.2074	1:15 840

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
Hurst, M.E.	1943	Abitibi-Timiskaming Area, Districts of Cochrane and Timiskaming	ODM Map 1934A	1:126 720
Jensen, L.S.	1985	Geological Overview of the BRIM Area (Abstract)	OGS Geo. Sci. Seminar & Open House '85	p.6
Jensen, L.S. Baker, C.L.	1986	Preliminary Results of Bedrock Samples from the Sonic Drilling Program (1985) in the Lake Abitibi-Matheson Area	OGS Map P.2986	1:100 000
Jensen, L.S. Langford, F.F.	1983	Geology and Petrogenesis of the Archean Abitibi Belt in the Kirkland Lake Area, Ontario	OGS OFR 5455	520p.
Jensen, L.S. Langford, F.F.	1985	Geology and Petrogenesis of the Archean Abitibi Belt in the Kirkland Lake Area, Ontario	OGS MP 123	130p.
Karvinen, W.O. Hunt, D.S.	1977	1976 Report of the Timmins Resident Geologist	OGS MP 71	p.63-80
Lee, H.A.	1979	Northern Ontario Engineering Geology Terrain Study, Data Base Map, Kirkland Lake	OGS Map 5030	1:100 000
Lovell, H.L. Caine, T.W.	1970	Lake Timiskaming Rift Valley	ODM MP 39	
Lovell, H.L. Grabowski, G. Guindon, D. Bath, A.C.	1986	Kirkland Lake Resident Geologist Area, Northern Region	OGS MP 128	p.179-212
Luhta, L.E. Sangster, P.J.	1985	Timmins Resident Geologist Area, Northern Region	OGS MP 122	p.134-161

GDIF FORM NO.9

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
Luhta, L.E. Sangster, P.J. Ireland, J.C.	1986	Timmins Resident Geologist Area, Northern Region	OGS MP 128	p.149-152
Malczak, J.	1985	Industrial Mineral Potential of the Black River-Matheson (BRIM) Area, District of Cochrane	OGS MP 126	p.326-328
Malczak, J.	1985	Overview of the Industrial Mineral Potential of the Black River-Matheson (BRIM) Area (Abstract)	OGS Geo. Sci. Seminar & Open House '85	p.9
McClenaghan, M.B.	1985	Backhoe Sampling and Analytical Procedures: Fingerprinting the Drift (Abstract)	OGS Geo. Sci. Seminar & Open House '85	p.10
Middleton, R.S.	1975	Gravity Control Network in the Timmins, Matheson and Cobalt Area, Cochrane and Timiskaming Districts, Ontario	ODM Geoscience Rept. 127	
Middleton, R.S.	1976	Gravity Survey of Geological Structures in the Timmins and Matheson Area, NTS 42A, Cochrane, Sudbury and Timiskaming Districts	ODM GR 135 Maps 2321 2322	
Northern Associates Ltd.	1985	Peat and Peatland Inventory of the Timmins-Kirkland Lake Area	OGS OFR 5540	609p.
OGS	1984	Ontario Mineral Deposit Inventory	OGS OFR 5470	
OGS	1986	Backhoe Till Samples, Stock, Taylor, Carr, Currie, Bowman and Sheraton Townships, District of Cochrane	OGS Map 80 793	1:100 000
OGS	1986	Sonic Drillhole 85-53, Thomas Township, Cochrane District	OGS Map 80 888	1:100 000

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
OGS	1986	Sonic Drillhole 85-54, Sheraton Township, Cochrane District	OGS Map 80 889	1:100 000
OGS	1986	Sonic Drillholes 85-55 and 85-56, Sheraton and Egan Townships, Cochrane District	OGS Map 80 890	1:100 000
Pitcher, D.H.	1985	A Correlation of Airborne and Ground Electromagnetics With Sonic Drilling Results in the Black River-Matheson Area	OGS MP 126	p.334-340
Pitcher, D.H. Barlow, R.B. McNeill, J.D.	1984	Mapping the Overburden in Black River-Matheson (BRIM) Area, District of Cochrane, employing an airborne time-domain system	OGS MP 119	p.299-307
Pyke, D.R.	1974	Watabeag River Area, Districts of Cochrane and Timiskaming	ODM MP 59	p.94-98
Pyke, D.R.	1976	Watabeag River Area, Cochrane and Timiskaming Districts	ODM Map P.1078	1:63 360
Pyke, D.R.	1978	Regional Geology of the Timmins-Matachewan Area, District of Cochrane and Timiskaming	OGS MP 82	p.73-77
Pyke, D.R.	1980	Geology of the Watabeag Area, Districts of Cochrane and Timiskaming	OGS OFR 5290	125p.
Richard, J.A.	1984	Quaternary Geology of the Porquis Junction (42A/10) and Watabeag River (42A/7) Map Areas, District of Cochrane	OGS MP 119	p.283-286
Richard, J.A. McClenaghan, M.B.	1985	Quaternary Geology of the Watabeag River Area, District of Cochrane, (42A/7)	OGS Map P.2950	1:50 000

GDIF FORM NO.9

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
Sado, E.V.	1985	Summary of Activities 1985, Operation Black River-Matheson (BRIM)	OGS MP 126	p.287-290
Sado, E.V.	1985	Introduction to the Black River-Matheson Program (BRIM) (Abstract)	OGS Geo. Sci. Seminar & Open House '85	p.5
Sado, E.V.	1986	Summary of Activities 1986, Operation Black River Matheson (BRIM)	OGS MP 132	
Satterly, J.	1958	Geological Map of the Province of Ontario	ODM Map 1958B	1:1 267 200
Satterly, J.	1968	Aeromagnetic Maps of Carbonatite-Alkalic Complexes in Ontario	ODM Map P.452	1:4 224 000
Savage, W.S. Ginn, R.M. Fenwick, K.G.	1962	Kirkland Lake Sheet, Districts of Cochrane and Timiskaming	ODM Map P.150	1:126 720
Steele, K.G.	1985	Sonic Drilling- Rigs, Rods and Reasons (Abstract)	OGS Geo. Sci. Seminar & Open House '85	
Steele, K.G. Baker, C.L. McClenaghan, M.B.	1986	Reconnaissance Till Sampling Program, Matheson-Abitibi Area, District of Cochrane	OGS MP 132	p.398-403
Steele, K.G. McClenaghan, M.B. Baker, C.L.	1986	Gold Grains in Backhoe Till Samples (1984-85) from the Matheson-Lake Abitibi Area, District of Cochrane	OGS Map P.2983	1:100 000
Strangway, D.W. Geissman, J.W. Bambrick, J. Letros, S. et al.	1981	Magnetism and Stratigraphy in Volcanic and Sedimentary Rocks of the Abitibi Belt	OGS MP 98	p.251-266

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
Strangway, D.W. Ilkisik, O.M. Redman, J.D.	1983	Surface Electromagnetic Mapping in Selected Positions of Northern Ontario, 1982-83	OGS MP 112	p.159-173
Tihor, L.A. Hunt, D.S.	1979	1978 Report of the Timmins Resident Geologist	OGS MP 84	p.50-67
Vagners, U.J.	1983	Quaternary Geology of the Matheson and Lightning River Areas, District of Cochrane	OGS MP 116	p.101-103
Whittaker, P.J.	1985	Regional Metallogenesis of the BRIM Area, District of Cochrane (Abstract)	OGS Geo. Sci. Seminar & Open House '85	
Whittaker, P.J.	1986	Metallogenic Studies in the Black River-Matheson Area, Cochrane District	OGS OFM 65	
Whittaker, P.J. Malczak, J.	1984	Mineral Deposits Investigation in the Black River-Matheson (BRIM) Area, District of Cochrane	OGS MP 119	p.290-294
Wright, D.G.H.	1922	Watabeag Area, Timiskaming and Cochrane Districts	ODM Map 31D	1:63 360
Wright, D.G.H.	1922	Geology of the Watabeag Area, Timiskaming and Cochrane Districts	ODM AR v.31, pt.7	33p
		JOURNAL ARTICLES, THESES AND TECHNICAL REPORTS		
Agterberg, F.P. Chung, C.F. Fabbri, A.G. Kelly, A.M.	1972	Geomathematical Evaluation of Copper and Zinc Potential of the Abitibi Area, Ontario and Quebec	GSC Paper 71-41	55p.
Canada Department of Agriculture	1978	Soils of Timmins-Noranda-Rouyn Area, Ontario, NTS 42A-32D	Can. Dept. of Agri. Soil Surv. Rept. No. 46	

GDIF FORM NO.9

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages
Goodwin, A.M.	1980	Archean Volcanic Studies in the Timmins-Kirkland Lake-Noranda Region of Ontario and Quebec	GSC Bull. 278 Map 1461A	51p. 1:250 000
Goodwin, A.M.	1980	Geology of Timmins-Kirkland Lake, Ontario-Quebec	OGS Map 1461A acc. Bull. 278	
Hughes, O.L.	1965	Surficial Geology of Part of the Cochrane District, Ontario, Canada	Geol. Soc. of America Spec. Paper 84	
Jensen, L.S.	1985	Stratigraphy and Petrogenesis of Archean Metavolcanic Sequences, Southwestern Abitibi Subprovince, Ontario	GAC Spec. Paper No. 28	p.65-88
Kutina, J. Fabbri, A.	1972	Relation of Structural Lineaments and Mineral Occurrences in the Abitibi Area	GSC Paper 71-9	
Lee, H.A.	1968	An Ontario Kimberlite Occurrence Discovered by Application of the Glaciofocus Method to a Study of the Munro Esker	GSC Paper 68-7	3p.
Middleton, R.S.	1975	Gravity Control Network in the Timmins, Matheson and Cobalt Area, Cochrane and Timiskaming Districts, Ontario	ODM GR 127	

SELECTED REFERENCES

Author	Date	Title	Reference	Map Scales and/or Report Pages

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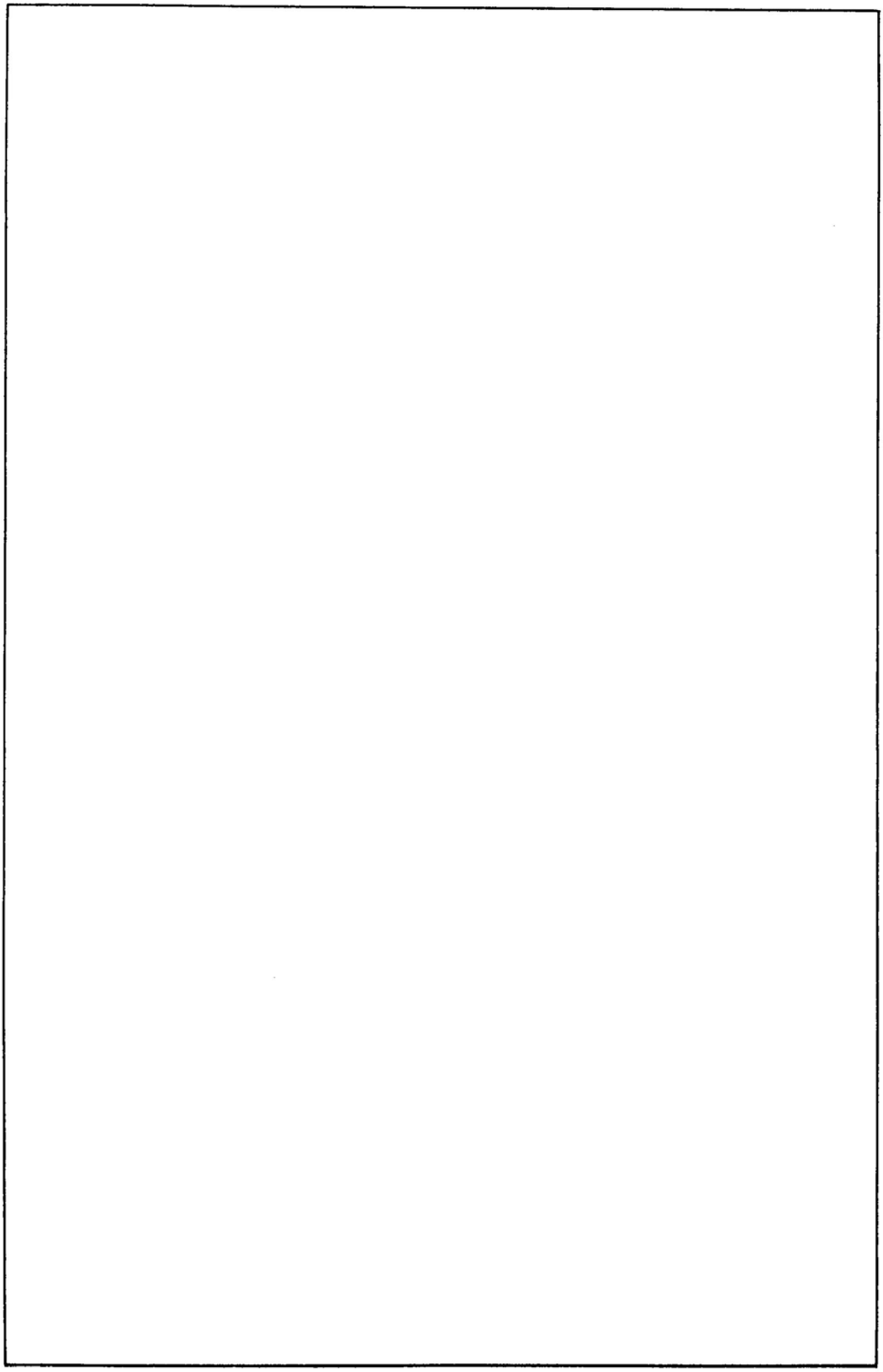
NOTES AND ADDENDA

GDIF FORM NO.10



SHERATON TOWNSHIP

Ministry of Northern Development and Mines

Mines and Minerals Division

Ontario

ONTARIO GEOLOGICAL SURVEY

PROPERTY LOCATION MAP

GEOLOGICAL DATA INVENTORY FOLIO 402

(Map 1 of 2)

SHERATON TOWNSHIP

DISTRICT OF COCHRANE

Scale 1:31 680

Kilometre 0.5 0 0.5 1 Kilometre

Mile 0.5 0 0.5 1 Miles

80°42' 00"

48°26' 30"

80°48' 00"

48°22' 00"

Gibson L.

Sheraton Lake

Little Driftwood R.

Driftwood R.

Kabsobo R.

Horn L.

Arrow L.

Bow L.

Warner Lake

EXPLORATION DATA FILE AREAS

■ /① ⑥ Reference number is always inside work area outlined. See listing in text pages.

■ x ④ Small area exploration.

TYPES OF DATA SHOWN ON THIS MAP

GEOCHEMICAL AND GEOCHRONOLOGICAL DATA

- Geochemical sample site, with reference number
- Area of geochemical sampling, with reference number
- Age dating material sampling site, with reference number

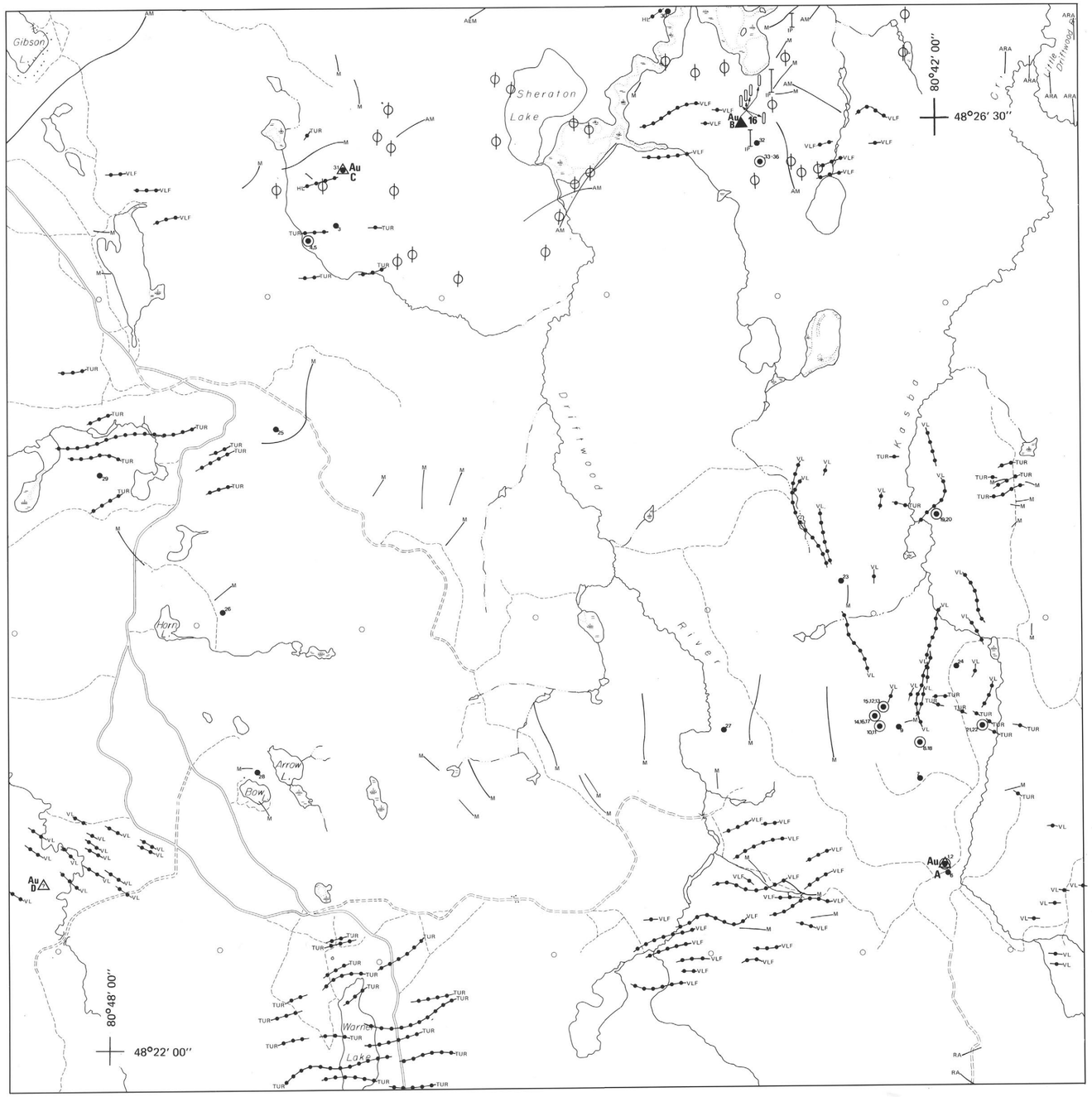
GEOPHYSICAL ANOMALIES

- Airborne magnetic anomaly
- Airborne electromagnetic anomaly Length of anomaly along flight line
- Airborne electromagnetic anomaly Location of anomaly along flight line
- Airborne electromagnetic anomaly Conductor axis: definite, probable, possible
- Airborne radiometric anomaly
- Ground magnetic anomaly
- Ground electromagnetic anomaly (VL - Vertical loop; HL - Horizontal loop; VLF - Very low freq; Turam; JEM - Crone Em - 16)
- Ground radiometric anomaly
- Induced polarization anomaly
- Self potential anomaly
- Audio-frequency magnetic anomaly (total intensity)
- Resistivity anomaly
- Gravity anomaly

MISCELLANEOUS DATA

- Trenching, pit with reference number
- Adit
- Open pit
- Rock quarry
- Sand and/or gravel pit

NOTE: Consult the text that accompanies this map for pertinent lists of data, references, and abbreviations.



Ontario

Ministry of Northern Development and Mines

Mines and Minerals Division

ONTARIO GEOLOGICAL SURVEY

EXPLORATION DATA MAP

GEOLOGICAL DATA INVENTORY FOLIO 402

(Map 2 of 2)

SHERATON TOWNSHIP

DISTRICT OF SUDBURY

Scale 1:31 680

Kilometre 0.5 0 0.5 1 Kilometre

Mile 0.5 0 0.5 1 Mile

GEOLOGICAL AND MINING SYMBOLS

TYPES OF DATA SHOWN ON THIS MAP

MINERAL OCCURRENCES

- Mineral occurrence at surface, with reference letter
- Mineral occurrence with shaft, depth given with reference letter
- Mineral occurrence reported but exact location uncertain, with reference letter
- Mineralized float with reference letter
- Mineral occurence in drillhole, with reference letter drillhole number

DRILLHOLE

- Location of single drillhole, with reference number
- Location of closely spaced group of drillholes, with reference number
- Drillhole, exact location uncertain, with reference number
- Property with underground drillholes in this general area, with reference number
- Property with drillholes which have not been plotted on map, with reference number
- Reverse circulation drillhole; churn drilling, with reference and number