

24 1 254 2693 20 0

MAP UTMZ UTME UTMN ORCONTTYP SAMWATDEPSAMDEPSAMLOC DIST CONTAMSI COMP CU
PB ZN MO NI MN AS AG

(A5,A6,F1.0,1X,F6.0,1X,F7.0,2A1,2F3.0,F1.0,F4.0,F1.0,F6.0,5F4.0,F5.0,2F4.0)

PROJECT 710099***** EGMA***** HORN BROOK***** 1971-72

THE PROJECT TITLE IS*** REGIONAL GEOCHEMICAL LAKE BOTTOM SEDIMENT AND TILL
SAMPLING IN THE TIMMINS-VAL D'OR REGION, ONT. AND QUE.

THE PRINCIPAL INVESTIGATORS WERE*** E.H.W. HORN BROOK AND C.F. GLEESON

THE PROJECT WAS CARRIED OUT UNDER THE SPECIAL EMPLOYMENT PLAN OF THE FEDERAL
GOVERNMENT WINTER WORKS PROGRAM. THE PROJECT SUPERVISOR WAS E.H.W. HORN BROOK AND
THE WORK WAS DONE UNDER CONTRACT BY C.F. GLEESON & ASSOCIATES LTD. , OTTAWA
DURING THE PERIOD DECEMBER 1971-APRIL 1972.

THE PRINCIPAL TECHNICAL OBJECTIVES OF THE PROJECT WERE TO TEST THE EFFECTIVENESS
OF GEOCHEMICAL EXPLORATION TECHNIQUES WITHIN THE ABITIBI-TIMISKAMING REGIONS OF
NORTHERN ONTARIO AND N.W. QUEBEC. TWO PRINCIPAL METHODS WERE INVESTIGATED.
THESE WERE*** REGIONAL LAKE BOTTOM SEDIMENT SAMPLING, AND*** BASAL TILL SAMPLING
BY MEANS OF THROUGH-ICE OVERBURDEN DRILLING IN SELECTED LAKES WITHIN THE GREAT
CLAY BELT OF ABITIBI REGION. AN ADDITIONAL OBJECTIVE WAS TO COMPARE METAL
CONCENTRATIONS AND DISPERSION TRAINS IN TILLS VS. LAKE BOTTOM SEDIMENTS AND TO
DETERMINE OPTIMUM SAMPLE FRACTION SIZE FOR ANALYSIS OF LAKE BOTTOM SEDIMENTS,
TILLS, AND HEAVY MINERAL SEPARATES.

AN OVERALL OBJECTIVE WAS TO ATTEMPT TO ISOLATE TARGET AREAS FOR FOLLOW-UP
INVESTIGATIONS BY INDUSTRY.

THE RESULTS OF THE STUDY SUGGEST THAT THE TILL SAMPLING METHOD IS A PROMISING
SEMI-RECONNAISSANCE TOOL FOR GEOCHEMICAL EVALUATION OF THE CLAY BELT TERRAIN.
WITH LOCAL EXCEPTIONS, LAKE BOTTOM SEDIMENTS ARE NOT CONSIDERED A SATISFACTORY
SAMPLING MEDIUM IN THIS ENVIRONMENT. OUTSIDE THE LIMITS OF THE CLAY BELT, LAKE
SEDIMENT SAMPLING IS A USEFUL EXPLORATION METHOD IN ABITIBI-TIMISKAMING TERRAIN.

RAW DATA RESULTS WERE RELEASED AS GEOLOGICAL SURVEY OF CANADA OPEN FILE 112 IN 1972. THIS FILE CONSISTS OF 10 SAMPLE LOCATION MAPS AND TWO DATA-BOOKS CONTAINING FIELD AND ANALYTICAL SAMPLE RECORDS AS WELL AS PRELIMINARY STATISTICAL EVALUATION OF ANALYTICAL DATA. THE STATISTICAL WORK WAS DONE BY COMPUTER APPLICATIONS AND SYSTEMS ENGINEERING, TORONTO, UNDER CONTRACT TO C.F. GLEESON & ASSOCIATES. IN 1973 GEOLOGICAL SURVEY OF CANADA OPEN FILE 127 WAS RELEASED, CONSISTING OF 16 MOVING AVERAGE-RESIDUAL ANOMALY MAPS ON A SCALE OF 1:250,000. THESE MAPS SHOW THE DISTRIBUTION OF CU, ZN, PB, NI, AS, MO AND MN IN LAKE BOTTOM SEDIMENTS. ADDITIONAL INTERPRETATIVE RESULTS ARE GIVEN BY GLEESON AND HORN BROOK (1974).

THE AREA INCLUDED IN THIS RECONNAISSANCE SURVEY COMPRISES PARTS OF THE ARCHEAN ABITIBI OROGENIC BELT OF ONTARIO AND QUEBEC, AS WELL AS PARTS OF THE ABITIBI BELT FORELAND REGION TO THE SOUTH, INCLUDING SEGMENTS OF THE COBALT PLAIN. THE BULK OF THE SAMPLING WAS DONE IN AREAS UNDERLAIN BY ARCHEAN ABITIBI ROCKS, INCLUDING VOLCANIC AND METAVOLCANIC FLOWS, VOLCANOGENIC SEDIMENTARY ROCKS, GRANITIC PLUTONIC ROCKS, AND MAFIC AND ULTRAMAFIC EXTRUSIVE-INTRUSIVE SUITES. LOCALLY, IN THE ABITIBI FORELAND AREA (BELLETERRE-TIMISKAMING-MATACHEWAN-GOWGANDA-GOGAMA) SAMPLED BLOCKS MAY INCLUDE TERRAIN UNDERLAIN BY APHEBIAN COBALT GROUP ROCKS.

THE TIMMINS-NORANDA-VAL D'OR PART OF ABITIBI BELT LIES NEAR THE SOUTHERN EDGE OF THE GREAT (ABITIBI) CLAY BELT, AND BECAUSE OF THE EXTENSIVE GLACIAL AND GLACIO-LACUSTRINE CLAY COVER DEPOSITS, NORMAL GEOCHEMICAL EXPLORATION METHODS HAVE HAD ONLY LIMITED APPLICATION IN THE PAST. A LOGICAL SAMPLING MEDIUM IN THIS ENVIRONMENT IS THE BASAL OR LODGEMENT TILL UNDERLYING THE CLAY AND THE OVERBURDEN DRILLING PART OF THIS PROJECT WAS DESIGNED TO EVALUATE THIS CONCEPT.

THE NTS SHEETS INVOLVED IN THIS PROJECT FOLLOW***

***31N 11, 13, 14

***31M 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

***32C 3, 4

***32D 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 14, 15

***41P 9-16

***42A 1-10

DETAILS OF THE SAMPLE LOCATION MAPS ACCOMPANYING OPEN FILE 112 FOLLOW***

***TITLE	***ITEM	***SCALE	***LAT. & LONG.
NORANADA-VAL D'OR-BELLETERRE	REG. SEDS.	1:250,000	47-00N - 48-35N 77-00W - 79-30W
KIRKLAND L.-TIMMINS-MATCHEWAN- GOWGANDA-GOGAMA ONT.	REG. SEDS.	1:250,000	47-15N - 48-30N 79-30W - 82-00W
LAC ABITIBI, QUE. (LA REINE TWP.)	LAKE SEDS.	1:50,000	48-40N - 79-15W - 79-30W
LAC ABITIBI, QUE	BASAL TILL	1:50,000	AS ABOVE
LAC MACAMIC, QUE (ROYAL-ROUSILLON TWP.)	LAKE SEDS.	1 IN.=1/2 MI.	48-45N - 79-00W
LAC MACAMIC, QUE	BASAL TILL	1 IN.=1/2MI.	AS ABOVE
LAC PELLETIER, QUE. (ROUYN TWP.)	LAKE SEDS.	1IN.=750 FT.	48-12N - 79-03W
LAC PELLETIER, QUE.	BASAL TILL	1 IN.=750 FT.	AS ABOVE
NIGHTHAWK LAKE, ONT. (CODY AND MACKLEM TWPS.)	LAKE SEDS.	1 IN.=2000 FT.	48-30N - 80-55W 48-32N - 81-00W
NIGHTHAWK LAKE, ONT.	BASAL TILL	1 IN.=2000FT.	AS ABOVE

THE EGMA PROGRAM WAS CONDUCTED IN WINTER BY SAMPLING THROUGH LAKE ICE. ACCESS WAS BY VEHICLE OVER PLOUGHED ROADS, SNOWMOBILE AND SNOWSHOE. DUE TO VARYING CONDITIONS OF WEATHER, ACCESS, AND LOGISTICS, SAMPLE DENSITY IS VARIABLE, BUT IN THE CASE OF THE REGIONAL LAKE SEDIMENTS PART OF THE PROGRAM, AN AVERAGE DENSITY OF ABOUT 1 PER 4 SQUARE MILES OR 1 PER 10.4 KM² WAS RECORDED.

CONTAMINATION DUE TO NEARBY MINE WORKINGS IS A POTENTIAL HAZARD IN INTERPRETATION OF THESE DATA AND PUBLISHED OPEN FILE RESULTS CONTAIN CAUTIONARY

NOTES TO THIS EFFECT.

LAKE BOTTOM SEDIMENTS WERE OBTAINED BY FREE-FALLING CORE-TYPE OR SPOON-TYPE SAMPLERS DEPLOYED THROUGH CHOPPED OR AUGERED ICE-HOLES. TILL SAMPLES WERE OBTAINED BY THROUGH-ICE DRILLING WITH PORTABLE HAND-HELD PIONJAR BR-52 DRILLS USING MODIFIED HEAVY-WALL XRT RODS FITTED WITH CUSTOM-BUILT POINTS AND SAMPLERS.

THE REGIONAL LAKE SEDIMENT PART OF THE PROJECT INVOLVED THE COLLECTION AND ANALYSIS OF 2693 SAMPLES. ALL ANALYSES WERE CARRIED OUT ON THE MINUS 230 MESH FRACTIONS.

TILL SAMPLES WERE COLLECTED BY OVERBURDEN DRILLING FROM FOUR LAKES WITHIN THE PROJECT AREA. THESE WERE*** LAC ABITIBI, LAC MACAMIC AND LAC PELLETIER IN QUEBEC, AND*** NIGHTHAWK LAKE IN ONTARIO. A TOTAL OF 1064 SAMPLES OR SAMPLE FRACTIONS WAS ANALYZED. THIS TOTAL INCLUDES LAKE SEDIMENT, TILL, AND HEAVY MINERAL SAMPLES OR FRACTIONS OF SAMPLES FROM THE SAME SITE, ALONG WITH A TEST GROUP OF 262 SAMPLES WHICH WERE ANALYZED ON MINUS 80 MESH FRACTIONS. THE DISTRIBUTION OF ANALYZED SAMPLES BY LAKE AND BY TYPE OR FRACTION FOLLOWS***

***LAKE	SEDS. -230M	SEDS. -80M	TILL - 230M	TILL -80M	HM -50+230M	HM -80M	TOTAL
***ABITIB	52		55		54		161
***NTHWK	73		73		72		218
***MACAMIC	79	20	85		78		262
***PELLET	28	26	27	28	25	27	161
***TEST GROUP		262					262
TOTALS	232	308	240	28	229	27	1064

ALL ANALYTICAL WORK WAS DONE IN THE OTTAWA LABORATORY OF BONDAR-CLEGG AND COMPANY LIMITED. WITH THE EXCEPTION OF ARSENIC ALL ELEMENTS WERE ANALYZED BY ATOMIC ABSORPTION SPECTROSCOPY AFTER DIGESTION WITH A HOT SOLUTION OF HNO3-HCL. ARSENIC WAS DETERMINED COLORIMETRICALLY AFTER DIGESTION WITH A MEXTURE OF NITRIC AND PERCHLORIC ACID AND TREATMENT WITH SILVER DIETHYLDITHIOCARBOMATE.

DETECTION LIMITS FOLLOW***

ELEMENT	DETECTION LIMIT IN PPM
CU	1
PB	2
ZN	1
MO	0.5
NI	1
MN	10
AS	0.5
AG	0.5

PRECISION INFORMATION FOLLOWS***

PRECISION INFORMATION FOR TILL AND HEAVY MINERAL SAMPLE ANALYSES IS NOT AVAILABLE.

PRECISION INFORMATION FOR LAKE SEDIMENT SAMPLES, GIVEN AT TWO STANDARD DEVIATIONS (95% CONFIDENCE LEVEL) IN PPM. FOLLOWS***

S	N	CU	PB	ZN	MO
0	12	65.0 36.8	12.8 40.8	45.0 24.6	2.7 48.8
1	15	53.9 12.2	22.0 19.4	98.7 8.2	2.7 46.3
3	15	50.6 12.0	16.3 21.0	83.9 9.1	2.7 43.5
6	15	1021 9.1	440 14.6	2840 13.9	5.0 26.2

S	N	NI	MN	AS	AG
0	12	24.8 17.3	229.6 22.4	1.8 102.2	1.0 61.4
1	15	51.6 10.5	449.7 13.2	2.7 83.5	1.2 24.9
3	15	38.9 10.4	312.7 20.4	1.6 79.0	1.1 32.3
6	15	62.3 10.2	434.1 12.5	15.9 37.8	14.4 43.3

NOTE THAT FOR DATA ABOVE S IS REFERENCE SAMPLE NUMBER
N IS NUMBER OF ANALYSES (RUNS)
UNDER EACH ELEMENT HEADING THE FIRST COLUMN

IS THE ARITHMETIC MEAN AND THE SECOND COLUMN
IS THE PRECISION, BOTH IN PPM.

***NOTE THAT SINCE ELEMENT LEVELS IN SAMPLES 0, 1 AND 3 ARE SIMILAR, THEY
CAN BE AVERAGED AND COMPARED WITH SAMPLE 6 AS FOLLOWS***

S	N	CU	PB	ZN	MO				
0-3	42	56.5	20.3	14.7	27.1	75.9	14.0	2.7	46.2
6	15	1021	9.1	440	14.6	2840	13.9	5.0	26.2

		NI	MN	AS	AG				
0-3	42	38.4	12.7	330.7	18.7	2.0	88.2	1.1	39.5
6	15	62.3	10.2	434.1	12.5	15.9	37.8	14.4	43.3

THE PRINCIPAL REFERENCES FOR THIS PROJECT FOLLOW***

GEOLOGICAL SURVEY OF CANADA 1972 REGIONAL GEOCHEMICAL LAKE BOTTOM
SEDIMENT AND TILL SAMPLING IN THE TIMMINS-VAL D'OR REGION OF ONTARIO
AND QUEBEC. GEOL. SURV. CAN. OPEN FILE 112, JULY 31, 1972.

GEOLOGICAL SURVEY OF CANADA 1973 MOVING AVERAGE-RESIDUAL ANOMALY
MAPS FOR CU, ZN, PB, NI, AS, AG, MO, AND MN DISTRIBUTION IN LAKE
BOTTOM SEDIMENTS IN THE TIMMINS-VAL D'OR REGION OF ONTARIO AND QUEBEC.
GEOL. SURV. CAN. OPEN FILE 127, JANUARY 26, 1973.

GLEESON, C.F. AND HORNBROOK, E.H.W. 1974 SEMI-REGIONAL AND DETAILED
GEOCHEMICAL STUDIES DEMONSTRATING THE EFFECTIVENESS OF TILL SAMPLING
AT DEPTH. PAPER PRESENTED AT THE 5TH.INTERNATIONAL GEOCHEM. SYMP.,
VANCOUVER, B.C., APRIL, 1974.

THIS PROJECT IS DIVIDED INTO TWO FILES AS FOLLOWS***

FILE 024***REGIONAL LAKE SEDIMENT SAMPLES AND COMPLETE TEXT***

FILE 025***TILL AND DETAILED LAKE SEDIMENT SAMPLES***