

REGIONAL LAKE SEDIMENT AND WATER GEOCHEMICAL RECONNAISSANCE DATA, SASKATCHEWAN 1984, GSC-OF 1106, NGR 71-1984, NTS 64E, PARTS OF 74A, H

```
*****  
*  
*      OPEN FILE      1106      *  
*  
*****
```

	PAGE
SURVEY NOTES	1
DATA LIST	7
SUMMARY STATISTICS	36

GEOLOGICAL SURVEY OF CANADA OPEN FILE 1106,
REGIONAL LAKE SEDIMENT AND WATER GEOCHEMICAL RECONNAISSANCE DATA,
NORTHEASTERN SASKATCHEWAN, NTS 64E AND PARTS OF 74A AND 74H.

THE RECONNAISSANCE SURVEY WAS UNDERTAKEN BY THE GEOLOGICAL SURVEY OF CANADA IN
CONJUNCTION WITH THE SASKATCHEWAN DEPARTMENT OF ENERGY AND MINES UNDER THE
CANADA-SASKATCHEWAN MINERAL DEVELOPMENT AGREEMENT (1984-1989)

E.H.W. HORNBROOK DIRECTED THE SURVEY PROGRAM.

P.W.B. FRISKE COORDINATED THE OPERATIONAL ACTIVITIES OF THE CONTRACTING
AND GEOLOGICAL SURVEY OF CANADA STAFF THROUGHOUT THE SURVEY.

CONTRACTS LET FOR COLLECTION, SAMPLE PREPARATION AND ANALYSIS WERE THE
RESPONSIBILITY OF, AND WERE SUPERVISED AND/OR MONITORED BY THE STAFF OF
THE RESOURCE GEOCHEMISTRY SUBDIVISION AS FOLLOWS:

COLLECTION: - MARSHALL MACKLIN MONAGHAN LTD., TORONTO, ONTARIO
- E.H.W. HORNBROOK, P.W.B. FRISKE

PREPARATION: - GOLDER ASSOCIATES, OTTAWA, ONTARIO
- J.J. LYNCH

ANALYSIS: - BARRINGER MAGENTA LTD., REXDALE, ONTARIO
- BARRINGER MAGENTA (ALBERTA) LTD., CALGARY, ALBERTA
- J.J. LYNCH

N.G. LUND WAS RESPONSIBLE FOR DATA MANAGEMENT AND OPEN FILE PRODUCTION.

B. ELLIOTT CARRIED OUT THE DATA PROCESSING.

A.C. GALLETTA PREPARED THE REGIONAL TREND MARGINAL MAP UTILIZING A
PROGRAM DEVELOPED BY D.J. ELLWOOD.

J. YELLE SUPERVISED MAP PREPARATION.

COMPUTING AND PLOTTING FACILITIES WERE PROVIDED BY THE COMPUTER SCIENCE
CENTER, E.M.R.

OPEN FILE TEXT WAS MANUFACTURED BY K.G. CAMPBELL CORPORATION LAZER PRINTING,
OTTAWA

HELICOPTER SUPPORTED SAMPLE COLLECTION WAS CARRIED OUT DURING
THE SUMMER OF 1984.
LAKE SEDIMENT AND WATER SAMPLES WERE COLLECTED AT AN AVERAGE DENSITY OF ONE
SAMPLE PER 13 SQUARE KILOMETERS THROUGHOUT THE 18,800 SQUARE KILOMETERS OF THE
NORTHEASTERN SASKATCHEWAN SURVEY AREA.

SAMPLE SITE DUPLICATE SAMPLES WERE ROUTINELY COLLECTED IN EACH
ANALYTICAL BLOCK OF TWENTY SAMPLES.

IN OTTAWA, FIELD DRIED SAMPLES WERE AIR-DRIED, CRUSHED, BALL MILLED AND SIEVED. THE MINUS 80 MESH (177 MICRONS) FRACTION WAS USED FOR SUBSEQUENT ANALYSES. AS REQUIRED, AT THIS TIME, CONTROL REFERENCE AND BLIND DUPLICATE SAMPLES WERE INSERTED INTO EACH BLOCK OF TWENTY SEDIMENT SAMPLES. FOR THE WATER SAMPLES, ONLY CONTROL REFERENCES WERE INSERTED INTO THE BLOCK. THERE WERE NO BLIND DUPLICATE WATER SAMPLES.

ON RECEIPT, FIELD AND ANALYTICAL DATA WERE PROCESSED WITH THE AID OF COMPUTERS. THE FIELD DATA WERE RECORDED BY THE FIELD CONTRACT STAFF ON STANDARD LAKE SEDIMENT FIELD CARDS (REV. 74) USED BY THE GEOLOGICAL SURVEY OF CANADA (GARRETT, 1974). THE SAMPLE SITE POSITIONS WERE MARKED ON APPROPRIATE 1/250,000 SCALE NTS MAPS IN THE FIELD. THESE MAPS WERE DIGITIZED AT THE GEOLOGICAL SURVEY IN OTTAWA TO OBTAIN THE SAMPLE SITE UTM COORDINATES.

THE SAMPLE SITE COORDINATES WERE CHECKED AS FOLLOWS: A SAMPLE LOCATION MAP WAS PRODUCED ON A CALCOMP 1051 DRUM PLOTTER USING THE DIGITIZED COORDINATES; THE FIELD CONTRACTOR'S SAMPLE LOCATION MAP WAS THEN OVERLAYED WITH THE CALCOMP MAP; THEY WERE CHECKED FOR COINCIDENCE. THE DOMINANT ROCK TYPES IN THE LAKE CATCHMENT BASINS WERE IDENTIFIED ON APPROPRIATE GEOLOGICAL MAPS USED AS THE BEDROCK GEOLOGICAL BASE ON RGR MAPS.

THOROUGH INSPECTIONS OF THE FIELD AND ANALYTICAL DATA WERE MADE TO CHECK FOR ANY MISSING INFORMATION AND/OR GROSS ERRORS.

QUALITY CONTROL AND MONITORING OF THE GEOCHEMICAL DATA WAS UNDERTAKEN BY A STANDARD METHOD USED BY THE RESOURCE GEOCHEMISTRY SUBDIVISION AT THE GEOLOGICAL SURVEY OF CANADA.

FOR THE DETERMINATION OF ZN, CU, PB, NI, CO, AG, MN, FE, CD, AS AND SB, A 1 GRAM SAMPLE WAS REACTED WITH 6 ML OF A MIXTURE OF 4M HCL AND M HNO₃ IN A TEST-TUBE OVERNIGHT AT ROOM TEMPERATURE. AFTER DIGESTION, THE TEST-TUBE WAS IMMERSERD IN A HOT WATER BATH AT ROOM TEMPERATURE AND BROUGHT UP TO 90C AND HELD AT THIS TEMPERATURE FOR 2 HOURS WITH PERIODIC SHAKING. THE SAMPLE SOLUTION WAS THEN DILUTED TO 20 ML WITH METAL FREE WATER AND MIXED. ZN, CU, PB, NI, CO, AG, MN, FE AND CD WERE DETERMINED BY ATOMIC ABSORPTION SPECTROSCOPY USING AN AIR-ACETYLENE FLAME. BACKGROUND CORRECTIONS WERE MADE FOR PB, NI, CO, AG AND CD. AS AND SB WERE DETERMINED BY ATOMIC ABSORPTION USING A HYDRIDE EVOLUTION METHOD WHEREIN THE HYDRIDE (ASH₃ OR SBH₃) IS EVOLVED, PASSED THROUGH A HEATED QUARTZ TUBE IN THE LIGHT PATH OF AN ATOMIC ABSORPTION SPECTROPHOTOMETER. THE METHOD IS DESCRIBED BY ASLIN (1976).

MOLYBDENUM AND VANADIUM WERE DETERMINED BY ATOMIC ABSORPTION SPECTROSCOPY USING A NITROUS OXIDE ACETYLENE FLAME.
A 0.5 GRAM SAMPLE WAS REACTED WITH 1.5 ML CONCENTRATED HNO₃ AT 90C FOR 30 MINUTES.
AT THIS POINT 0.5 ML CONCENTRATED HCL WAS ADDED AND THE DIGESTION WAS CONTINUED AT 90C FOR AN ADDITIONAL 90 MINUTES.
AFTER COOLING, 8 ML OF 1250 PPM AL SOLUTION WERE ADDED AND THE SAMPLE SOLUTION WAS DILUTED TO 10 ML BEFORE ASPIRATION.

MERCURY WAS DETERMINED BY THE HATCH AND OTT PROCEDURE WITH SOME MODIFICATIONS. THE METHOD IS DESCRIBED BY JONASSON ET AL. (1973).
A 0.5 GRAM SAMPLE WAS REACTED WITH 20 ML CONCENTRATED HNO₃ AND 1 ML CONCENTRATED HCL IN A TEST-TUBE FOR 10 MINUTES AT ROOM TEMPERATURE PRIOR TO 2 HOURS OF DIGESTION WITH MIXING AT 90C IN A HOT WATER BATH.
AFTER DIGESTION, THE SAMPLE SOLUTIONS WERE COOLED AND DILUTED TO 100 ML WITH METAL FREE WATER.
THE HG PRESENT WAS REDUCED TO THE ELEMENTAL STATE BY THE ADDITION OF 10 ML W/V S₂O₄ IN M H₂SO₄.
THE HG VAPOUR WAS THEN FLUSHED BY A STREAM OF AIR INTO AN ABSORPTION CELL MOUNTED IN THE LIGHT PATH OF AN ATOMIC ABSORPTION SPECTROPHOTOMETER.
ABSORPTION MEASUREMENTS WERE MADE AT 253.7 NM.

LOSS ON IGNITION WAS DETERMINED USING A 500 MG SAMPLE.
THE SAMPLE, WEIGHED INTO 30 ML BEAKER, WAS PLACED IN A COLD MUFFLE FURNACE AND BROUGHT UP TO 500C OVER A PERIOD OF 2-3 HOURS.
THE SAMPLE WAS LEFT AT THIS TEMPERATURE FOR 4 HOURS, THEN ALLOWED TO COOL TO ROOM TEMPERATURE FOR WEIGHING.

URANIUM WAS DETERMINED USING A NEUTRON ACTIVATION METHOD WITH DELAYED NEUTRON COUNTING.
WITH THE EXCEPTION OF THE IRRADIATION FACILITY, THE METHOD IS VERY SIMILAR TO THAT USED BY AECL IN PREVIOUS YEARS, A DETAILED DESCRIPTION OF WHICH IS PROVIDED BY BOULANGER ET AL (1975).
A TWO GRAM SAMPLE WAS IRRADIATED FOR 10 SECONDS IN THE TRIGA REACTOR LOCATED AT WASHINGTON STATE UNIVERSITY.
THE OPERATING FLUX WAS 8×10^{13} NEUTRONS/SQUARE CM/SECOND.
AFTER A 10 SECOND DELAY, THE SAMPLE WAS COUNTED FOR 10 SECONDS.
THE COUNTING EQUIPMENT WAS OF AECL DESIGN. CALIBRATION WAS DONE TWICE A DAY OR AS REQUIRED.
ONE STANDARD WAS ANALYSED AFTER EVERY 20 SAMPLES.

FLUORIDE IN LAKE WATER SAMPLES WAS DETERMINED USING A FLUORIDE ELECTRODE PRIOR TO MEASUREMENT AN ALIQUOT OF THE SAMPLE WAS MIXED WITH AN EQUAL VOLUME OF TISAB II SOLUTION (TOTAL IONIC STRENGTH ADJUSTMENT BUFFER). THE TISAB II BUFFER SOLUTION WAS PREPARED AS FOLLOWS: TO 50 ML METAL FREE WATER ADD 57 NL GLACIAL ACETIC ACID, 58 GM NaCl AND 4 GM CDTA (CYCLOHEXYLENE DINITRILE TETRAACETIC ACID). STIR TO DISSOLVE AND COOL TO ROOM TEMPERATURE. USING A PH METER, ADJUST THE PH BETWEEN 5.0 AND 5.5 BY SLOWLY ADDING 5M NaOH SOLUTION. COOL AND DILUTE TO ONE LITER IN A VOLUMETRIC FLASK.

HYDROGEN ION ACTIVITY (PH) WAS MEASURED WITH A COMBINATION GLASS-CALOMEL ELECTRODE AND A PH METER.

URANIUM IN WATERS WAS DETERMINED BY A LASER-INDUCED FLUOROMETRIC METHOD USING A SCINTREX UA-3 URANIUM ANALYSER. A COMPLEXING AGENT, KNOWN COMMERCIALY AS FLURAN AND COMPOSED OF SODIUM PYROPHOSPHATE AND SODIUM MONOPHOSPHATE, (HALL, G.E.M., 1979) IS ADDED TO PRODUCE THE URANYL PYROPHOSPHATE SPECIES WHICH FLUORESCES WHEN EXPOSED TO THE LASER. SINCE ORGANIC MATTER IN THE SAMPLE CAN CAUSE UNPREDICABLE BEHAVIOUR, A STANDARD ADDITION METHOD WAS USED. FURTHER, THERE HAVE BEEN INSTANCES AT THE G.S.C. WHERE THE REACTION OF URANIUM WITH FLURAN IS EITHER DELAYED OR SLUGGISH; FOR THIS REASON AN ARBITRARY 24 HOUR TIME DELAY BETWEEN THE ADDITION OF THE FLURAN AND THE ACTUAL READING WAS INCORPORATED INTO THIS METHOD. IN PRACTICE, 500 UL OF FLURAN SOLUTION WERE ADDED TO A 5 ML SAMPLE AND ALLOWED TO STAND FOR 24 HOURS. AT THE END OF THIS PERIOD FLUORESCENCE READINGS WERE MADE WITH THE ADDITION OF 0.0, 0.2 AND 0.4 PPB U. FOR HIGH SAMPLES THE ADDITIONS WERE 0.0, 2.0 AND 4.0 (20 UL ALIQUOTS OF EITHER 55 OR 550 PPB U WERE USED). ALL READINGS WERE TAKEN AGAINST A SAMPLE BLANK.

REGIONAL LAKE SEDIMENT AND WATER GEOCHEMICAL RECONNAISSANCE DATA, SASKATCHEWAN 1984, GSC-OF 1106, NGR 71-1984, NTS 64E, PARTS OF 74A, H

THE FOLLOWING TABLES DISPLAY THE DATA RECORD FORMAT SPECIFICATIONS.
 THE DETECTION LIMITS OF THE ANALYTICAL METHODS ARE GIVEN.
 THE SECOND FIGURE UNDER THE DETECTION LIMIT HEADING IS USED
 ARBITRARILY TO DENOTE VALUES BELOW THE DETECTION LIMIT (USUALLY
 1/2 DETECTION LIMIT)

ELEMENT FIELD	CARD	COLUMNS
MAP	1	01-06
ID	1	07-12
UTM ZONE	1	13-14
UTM EAST (METER)	1	15-20
UTM NORTH (METER)	1	21-27
ROCK TYPE	1	28-31
LAKE AREA	1	32-35
SAMPLE DEPTH (METER)	1	36-38
REPLICATE STATUS	1	39-40
RELIEF	1	41-43
CONTAMINATION	1	48-51
SAMPLE COLOUR	1	52-57
SUSPENDED MATTER	1	58-59

THE ANALYTICAL DATA WERE RECORDED AS FOLLOWS:

ELEMENT	UNITS	CARD	COLUMNS	DETECTION LIMIT
SEDIMENT				
ZN	PPM	2	21-25	2 1
CU	PPM	2	26-30	2 1
PB	PPM	2	31-35	2 1
NI	PPM	2	36-40	2 1
CO	PPM	2	41-45	2 1
AG	PPM	2	46-50	0.2 0.1
MN	PPM	2	51-55	5 2
AS	PPM	2	56-60	1 0.5
MO	PPM	2	61-65	2 1
FE	PCT	2	66-70	0.02 0.01
HG	PPB	2	71-75	10 5
LOI	PCT	2	76-80	1.0 0.5
U	PPM	3	21-25	0.5 0.2
V	PPM	3	31-35	5 2
CD	PPM	3	36-40	0.2 0.1
SB	PPM	3	51-55	0.2 0.1
WATER				
F	PPB	4	26-30	20 10
PH		4	31-35	
U	PPB	4	36-40	0.05 0.02

REFERENCES

- ASLIN, G.E.M. (1976) THE DETERMINATION OF ARSENIC AND ANTIMONY IN GEOLOGICAL MATERIALS BY FLAMELESS ATOMIC ABSORPTION SPECTROPHOTOMETER
JOURNAL OF GEOCHEMICAL EXPLORATION, VOL. 6, PP. 321-330.
- BOULANGER, A., EVANS, D.J.R. AND RABY, B.F. (1975) URANIUM ANALYSIS BY NEUTRON ACTIVATION DELAYED NEUTRON COUNTING: PROC. OF THE 7TH ANNUAL SYMP. OF CANADIAN MINERAL ANALYSTS. THUNDER BAY, ONTARIO, SEPT. 22-23, 1975.
- GARRETT, R.G. (1974) FIELD DATA ACQUISITION METHODS FOR APPLIED GEOCHEMICAL SURVEYS AT THE GEOLOGICAL SURVEY OF CANADA: GEOL SURV. CAN. PAPER 74-52.
- HALL, G.E.M. (1979) A STUDY OF THE STABILITY OF URANIUM IN WATERS COLLECTED FROM VARIOUS GEOLOGICAL ENVIRONMENTS IN CANADA; IN CURRENT RESEARCH, PART A, GEOL. SURV. CAN. PAPER 79-1A, P. 361-365.
- JONASSON, I.R., LYNCH, J.J. AND TRIP, L.J. (1973) FIELD AND LABORATORY METHODS USED BY THE GEOLOGICAL SURVEY OF CANADA IN GEOCHEMICAL SURVEYS: NO. 12, MERCURY IN ORES, ROCKS, SOILS, SEDIMENTS AND WATER: GEOL. SURV. CAN. PAPER 73-21.

DATA LIST LEGEND

MAP- NATIONAL TOPOGRAPHIC SYSTEM(NTS)- LETTERED QUADRANGLE
(SCALE 1:250000). PART OF SAMPLE NUMBER

ID- REMAINDER OF SAMPLE NUMBER- YEAR(2), FIELD CREW(1),
SAMPLE SEQUENCE NUMBER(3)

UTM COORDINATS- UNIVERSAL TRANVERSE MERCATOR(UTM) COORDINATE
SYSTEM- SAMPLE COORDINATES

ZN- ZONE
EAST- EASTING(METERS)
NORTH- NORTHING(METERS)

ROCK TYPE- MAJOR ROCK TYPE OF LAKE CATCHMENT AREA

LAKE AREA- AREA OF LAKE SAMPLED

SP DT- SAMPLE DEPTH MEASURED TO THE NEAREST METER

RP ST- REPLICATE STATUS- RELATIONSHIP OF SAMPLE WITH
RESPECT TO OTHERS WITHIN THE SURVEY

RELF- RELIEF OF THE SURROUNDING LAKE CATCHMENT BASIN

CONT- CONTAMINATION- HUMAN OR NATURAL(WORK-DRILL/TRENCH,
CAMP, FUEL OR GOSSAN)

SMPL COLOR- SEDIMENT COLOUR

SUSP- SUSPENDED MATTER

ZN- ZINC BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
CU- COPPER BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
PB- LEAD BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
NI- NICKEL BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
CO- COBALT BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
AG- SILVER BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
MN- MANGANESE BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
AS- ARSENIC BY COLOURIMETRY(PPM)
MO- MOLYBDENUM BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
FE- IRON BY ATOMIC ABSORPTION SPECTROSCOPY(%)
HG- MERCURY BY FLAMELESS SPECTROSCOPY(PPB)
LOI- LOSS ON IGNITION BY WEIGHT DIFFERENCE(%)
U- URANIUM BY DELAYED NEUTRON ACTIVATION(PPM)
V- VANADIUM BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
CD- CADMIUM BY ATOMIC ABSORPTION SPECTROSCOPY(PPM)
SB- ANTIMONY MIBK SOLVENT EXTRACTION ATOMIC
ABSORPTION SPECTROSCOPY(PPM)
F-W- FLUORINE IN WATER BY FISSION TRACK(PPB)
PH- PH BY COMBINATION GLASS-CALOMEL ELECTRODE
U-W- URANIUM IN WATERS BY SCINTREX(PPB)

ROCK TYPE:

WPEG- GRANITE PEGMATITE: VARIABLE GRAIN SIZE GENERALLY MASSIVE + OR - BIOTITE, MUSCOVITE, GARNET; CONTRACTS WITH MIGMATITIC SUPRACRUSTAL GNEISSES COMMONLY GRADITIONAL

WG - GRANITE AND ALASKALITE: FINE TO COARSE GRAINED, MASSIVE TO WEAKLY FOLIATED, + OR - BIOTITE, HORNBLLENDE, MAGNETITE, MICROLINE MEGACRYSTS; CONTACTS WITH MIGMATITIC SUPRACRUSTAL GNEISSES COMMONLY GRADITIONAL

WGDB- BIOTITE GRANODIORITE-TONALITE: MEDIUM TO COARSE GRAINED, MASSIVE TO FOLIATED, GREY TO BUFF; LOCAL XENOLITHS AND RAFTS OF AMPHIBOLITE, MICA SCHIST AND PSAMMITIC GNEISS

WSH - QUARTZ-MUSCOVITE SCHIST: PELITIC TO PSAMMOPELITIC, FINE TO MEDIUM GRAINED + OR - BIOTITE; LOCALLY INTENSELY SHEARED

WCN - CALC-SILICATE GNEISS, MARBLE, AND AMPHIBOLITE: MEDIUM GRAINED TO PEGMATITIC, VARIABLE COMPOSITION AND TEXTURE, + DIOPSIDE + OR - ALBITE, HORNBLLENDE, BIOTITE, ACTINOLITE/TREMOLITE, CALCITE, SCAPOLITE, GROSSULARITE; OCCURRING AS CONFORABLE BANDS AND LENSES IN SUPRACRUSTAL SEQUENCE

WRN - META-ARKOSIC GNEISS: FINE TO MEDIUM GRAINED MASSIVE TO FOLIATED TO GNEISSIC, LOCALLY LAYERED + OR - BIOTITE, HORNBLLENDE, DIOPSIDE, MUSCOVITE, SILLIMANITE, GARNET, CORDIERITE, MAGNETITE, PYRITE; LOCALLY INTERLAYERED WITH METAQUARTZITE, PELITE AND CALC-SILICATE ROCK; COMMONLY ANATECTIC WITH MORE THAN 50% LEUCOGRANITIC NEOSOME

WRQ - IMPURE METAQUARTZITE

WPSN- PELITIC TO PSAMMOPELITIC GNEISS: FINE TO MEDIUM GRAINED FOLIATED TO GNEISSIC + BIOTITE, QUARTZ + OR - FELDSPAR, GRAPHITE, SILLIMANITE, MUSCOVITE, CORDIERITE, GARNET, PYRITE/PYRRHOTITE; INTERLAYERED METAQUARTZITE, META-ARKOSE, CALC-SILICATE ROCK AND MARBLE WITH PSAMMITIC TYPES LOCALLY ABUNDANT; COMMONLY ANATECTIC WITH MORE THAN 50% LEUCOGRANITIC TO TONALITIC NEOSOME

WPF - GRAPHITE BEARING PELITIC GNEISS

ROCK TYPE:

(CONT)

WS - MIXED METASEDIMENT: VARIABLE UNIT BOTH ALONG AND ACROSS STRIKE, GENERALLY FINE GRAINED AND FOLIATED; INTERLAYERED LAMINATED SLATE, META-ARGILLITE, METAQUARTZITE, METACHERT, META-ARKOSE, CALC-SILICATE ROCK, MARBLE AND RARE BANDED IRON FORMATION

WQ - METAQUARTZITE: FINE GRAINED, MASSIVE TO FOLIATED, LOCALLY LAYERED + OR - MUSCOVITE, BIOTITE, GARNET, FELDSPAR, HORNBLLENDE, SULPHIDE; LOCAL CONGLOMERATE AND INTERLAYERED GRAPHIC META-ARGILLITE + OR - ANDALUSITE, GARNET, SULPHIDE

WR - META-ARKOSE: FINE TO MEDIUM GRAINED, MASSIVE TO FOLIATED, LOCALLY LAYERED AND CROSS STRATIFIED, + OR - MUSCOVITE, MAGNETITE, LITHIC FRAGMENTS; LOCAL CONGLOMERATE WITH GRANITE, GRANITE GNEISS, METAVOLCANIC AND METASEDIMENTARY CLASTS; LOCAL INTERBEDDED PELITIC SCHIST + OR - ANDALUSITE, STAUROLITE, GARNET

WV - AMPHIBOLITE, FINE GRAINED, MASSIVE TO POORLY FOLIATED, LOCALLY PILLOWED; LOCAL INTERCALATED PELITIC GNEISS

WFN - FELSIC GRANITOID GNEISS: FINE TO COARSE GRAINED, FOLIATED TO GNEISSIC, GENERALLY HOMOGENEOUS ROCKS OF SYENOGRANITIC TO GRANODIORITIC COMPOSITION + OR - BIOTITE, AMPHIBOLE, SILLIMANITE, WITH RARE HYPERSTHENE (OF GRANULITE FACIES METAMORPHIC ORIGIN); LOCAL INCLUSIONS OF AMPHIBOLITE AND/OR PELITIC SCHIST; LOCALLY PARTIALLY ANATECTIC WITH LEUCOGRANITE NEOSOME

WFB - BIOTITE-HORNBLLENDE BEARING

DD - DIABASE GABBRO: FINE TO COARSE GRAINED, MASSIVE TO WEAKLY FOLIATED + OR - OLIVINE, BIOTITE, HYPERSTHENE

MFC - FLUVIAL SANDSTONE MEMBER, LOCALLY PEBBLY

MFB - CONGLOMERATE MEMBER

X - CATACLASITE: MYLONITE AND SHEARED ROCKS OF THE NEEDLES FALLS SHEAR ZONE; DERIVED FROM ROCKS OF THE WOLLASTON AND PETER LAKE DOMAINS

ROCK TYPE:
(CONT)

- RGP - MEGACRYSTIC GRANITOID: MEDIUM TO COARSE GRAINED, MASSIVE TO FOLIATED, WITH LOCAL IGNEOUS FLOW BANDING; MICROCLINE MEGACRYSTS + OR - BIOTITE HORNBLLENDE QUARTZ MONZONITE, MONZOGRANITE, AND GRANODIORITE; LOCAL PELITE, AMPHIBOLITE AND/OR METADIORITE XENOLITHS; LOCALLY ABUNDANT PEGMATITE, APLITE AND NON-MEGACRYSTIC GRANITOID TOWARDS MARGINS
- RGPX- SHEARED VARIANTS WITH STRONGLY FOLIATED GROUNDMASS AND FLASERED MICROINCLINED MEGACRYSTS LOCALLY SUBMYLONITIC
- RGM - MONZOGRANITE-GRANODIORITE: CONTAINING ABUNDANT XENOLITHS AND RAFTS OF AMPHIBOLITE AND AMPHIBOLITE GNEISS DERIVED FROM UNIT PN
- RBD - QUARTZ MONZODIORITE, DIORITE AND GABBRO: FINE TO COARSE GRAINED, MASSIVE TO FOLIATED, + HORNBLLENDE, PLAGIOCLASE + OR - POTASSIUM FELDSPAR, QUARTZ, BIOTITE; LOCAL PARAGNEISS INCLUSIONS; CONTACT ZONES COMMONLY INJECTED WITH GRANITIC MATERIAL
- RGT - TONALITE, GRANODIORITE AND TRONDHJEMITE: COMPOSITIONALLY VARIABLE, GENERALLY POTASSIUM FELDSPAR-POOR, FINE TO COARSE GRAINED, LOCALLY PEGMATITIC, MASSIVE TO FOLIATED, + BIOTITE, + OR - MUSCOVITE, GARNET, HORNBLLENDE, LOCAL AMPHIBOLITE AND/OR PELITE INCLUSIONS
- RMG - AMPHIBOLITE AND DERIVED MIGMATITE: PALEOSOME FINE TO MEDIUM GRAINED, FOLIATED, LOCALLY LAYERED + HORNBLLENDE, FELDSPAR + OR - BIOTITE, MUSCOVITE, GARNET, QUARTZ; LOCAL PELITIC TO PSAMMITIC GNEISS AND CALC-SILICATE GNEISS; NEOSOME TONALITIC, GRANODIORITIC OR TRONDHJEMITIC (50 TO 90% OF UNIT) MEDIUM TO COARSE GRAINED TO PEGMATITIC, MASSIVE TO FOLIATED, + OR - BIOTITE, MUSCOVITE GARNET, HORNBLLENDE
- RNG - PELITIC TO PSAMMITIC GNEISS AND DERIVED MIGMATITE PALEOSOME FINE TO MEDIUM GRAINED, WELL FOLIATED TO GNEISSIC, LOCALLY LAYERED, + BIOTITE, QUARTZ, FELDSPAR + OR - MUSCOVITE, GARNET, SILLIMANITE, GRAPHITE; NEOSOME TONALITIC, GRANODIORITIC OR TRONDHJEMITIC (50 TO 90% OF UNIT), MEDIUM TO COARSE GRAINED TO PEGMATITIC, MASSIVE TO FOLIATED, + BIOTITE + OR - MUSCOVITE, GARNET, HORNBLLENDE
- PX - MYLONITE: FINE GRAINED TO APHANITIC, STREAKY TO FINE FINELY LAMINATED; INTERLAYERED MAFIC AND FELSIC GNEISS

ROCK TYPE:
(CONT)

- PGN - FELSIC GNEISS: MEDIUM GRAINED, STRONGLY FOLIATED TO GNEISSIC, LOCALLY SUBMYLONITIC GRANITOID ROCK + OR - BIOTITE, HORNBLLENDE, FLASERED MICROCLINE MEGACRYSTS
- PN - HORNBLLENDE-BIOTITE GNEISS: TONALITIC TO GABBROIC COMPOSITION, MEDIUM TO COARSE GRAINED, WITH MINOR METAGABBRO AND AMPHIBOLITE
- PBN - MAFIC GNEISS: FINE TO MEDIUM GRAINED, FOLIATED TO GNEISSIC, LOCALLY SUBMYLONITIC, + HORNBLLENDE, PLAGIOCLASE + OR - BIOTITE, QUARTZ, POTASSIUM FELDSPAR; LOCAL PODS OF WEAKLY FOLIATED TO MASSIVE MAFIC ROCK
- PBNG- AREA CUT BY NUMEROUS GRANITIC DYKES AND SILLS LIKELY DERIVED FROM THE WATHAMAN BATHOLITH
- PG - FELSIC GRANITOID: GENERALLY MEDIUM TO COARSE GRAINED, LOCALLY MEGACRYSTIC, MULTIPLY INTRUSIVE, GRANODIORITIC TO SYENITIC TO ALASKITIC AND APLITIC; LOCAL RELICT IGNEOUS TEXTURES, GENERALLY ONLY WEAKLY FOLIATED EXCEPT IN DISCRETE SHEAR ZONES; + OR - BIOTITE, AMPHIBOLE; LOCAL AMPHIBOLITE AND/OR PELITE INTRUSIONS
- PGP - MEGACRYSTIC GRANITOID (INDISTINGUISHABLE IN PLACES FROM UNIT RGP)
- PGPX- SHEARED VARIANTS
- PBG - MAFIC PLUTONIC ROCKS: FINE TO COARSE GRAINED, MASSIVE TO WEAKLY FOLIATED, METATONALITE TO METADIORITE TO METAGABBRO; LOCAL RELICT OPHITIC TO SUBOPHITIC TEXTURE; + OR - HORNBLLENDE, PLAGIOCLASE, BIOTITE, ACTINOLITE/TREMOLITE, WITH LOCAL META-SEDIMENTARY XENOLITHS; INCLUDES AMPHIBOLITIC ROCKS OF POSSIBLE METAVOLCANIC ORIGIN
- PBA - LAYERED METAGABBRO, MINOR ANORTHOSITE, ULTRAMAFIC ROCK AND GRANODIORITE
- PQF - QUARTZOFELDSPATHIC GNEISS: FINE TO MEDIUM GRAINED, EQUIGRANULAR, GENERALLY WELL FOLIATED TO GNEISSIC, LOCALLY COMPOSITIONALLY BANDED, GRANITIC TO GRANODIORITIC + BIOTITE + OR - HORNBLLENDE; LOCAL BIOTITE-HORNBLLENDE GNEISS LENSES
- PSL - SLATE, PHYLLITE AND BIOTITE SCHIST: VERY FINE TO FINE GRAINED, WELL FOLIATED, LOCALLY LAYERED, + BIOTITE, MUSCOVITE, PYRITE/PYRRHOTITE + OR - CARBONACEOUS MATERIAL; LOCAL HORNBLLENDE-BIOTITE SCHIST, PSAMMITE, AMPHIBOLITE AND METAGABBRO

REGIONAL LAKE SEDIMENT AND WATER GEOCHEMICAL RECONNAISSANCE DATA, SASKATCHEWAN 1984, GSC-OF 1106, NGR 71-1984, NTS 64E, PARTS OF 74A, H

ROCK TYPE:
(CONT)

LGD - GRANODIORITE AND QUARTZ MONZONITE: MEDIUM GRAINED,
WELL FOLIATED TO GNEISSIC, BIOTITE + OR -
HORNBLLENDE; ABUNDANT XENOLITHS OF PARAGNEISS
AND UNIT LGM

LGM - QUARTZ MONOZODIORITE: FINE TO COARSE GRAINED,
FOLIATED TO GNEISSIC; + HORNBLLENDE + OR -
BIOTITE; ABUNDANT XENOLITHS OF PARAGNEISS AND
AMPHIBOLITE; NEOSOMES OF GRANODIORITIC TO QUARTZ
MONZONITIC MATERIAL IN MIGMATITIC CONTACT ZONE

UKNN - UNKNOWN

LAKE AREA: POND- POND
LT 1- 1/4 TO 1 SQ KM
1-5- 1/4 TO 5 SQ KM
GT 5- GREATER THAN 5 SQ KM

RP ST: 00- ROUTINE REGIONAL SAMPLE
10- FIRST OF FIELD DUPLICATE
20- SECOND OF FIELD DUPLICATE

RELF: L- LOW
M- MEDIUM
H- HIGH

CONT: BLANK- NONE
1- PRESENT

SMPL COLOR: TN- TAN
YL- YELLOW
GN- GREEN
GY- GREY
BR- BROWN
BK- BLACK

SUSP: BLANK- NONE
L- LOW
H- HIGH