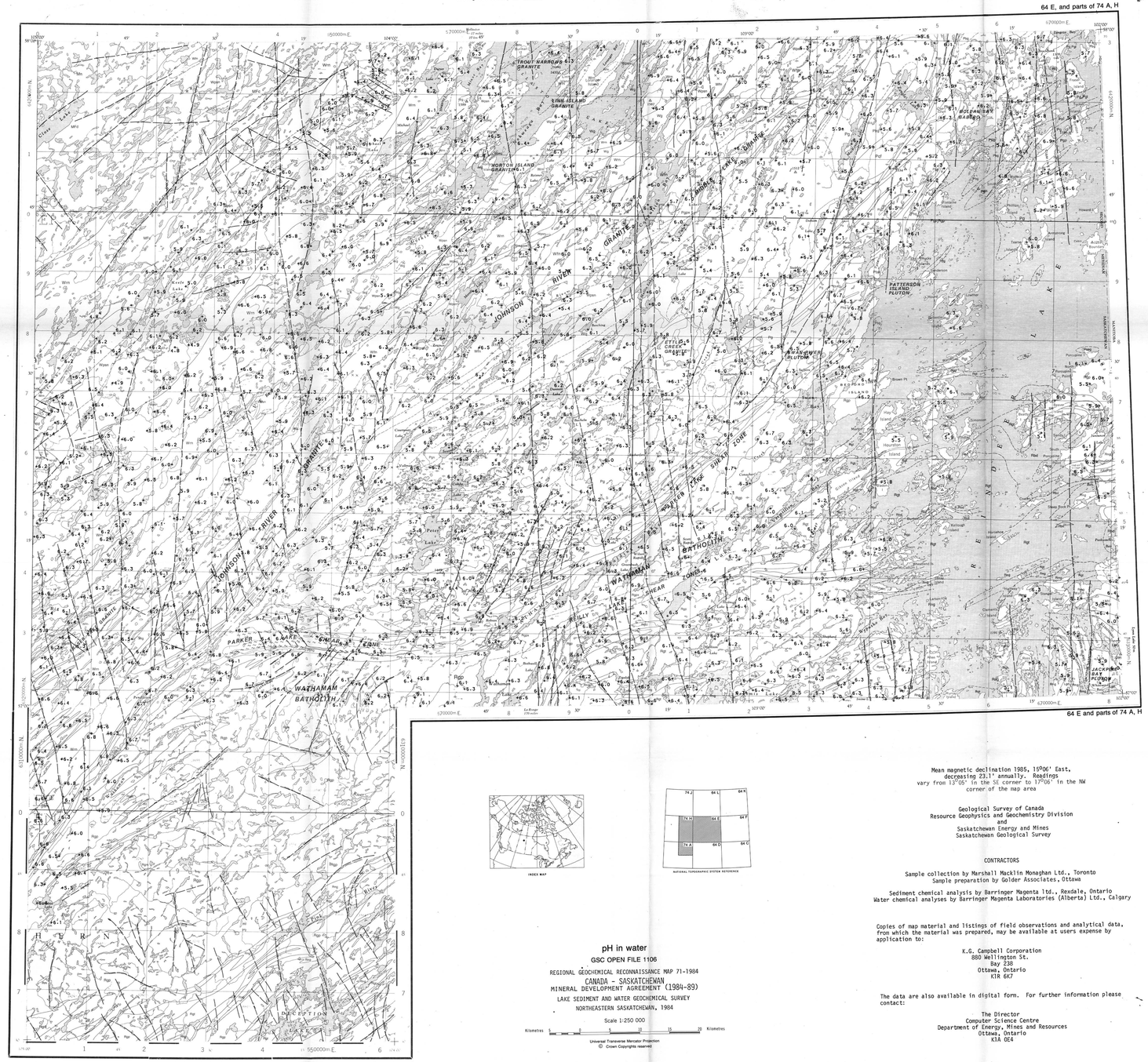
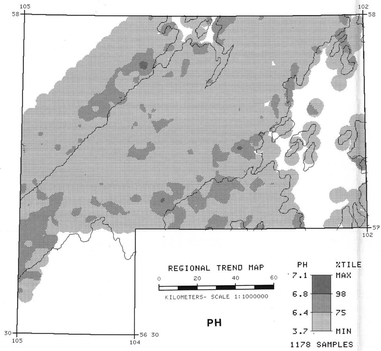
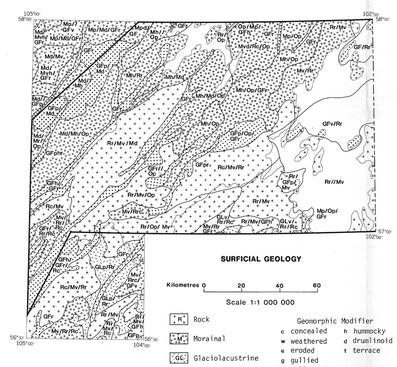
Canada
Department of Energy, Mines and Resources
Geological Survey of Canada

Province of Saskatchewan
Saskatchewan Energy and Mines
Saskatchewan Geological Survey







Complexes: where two or more classes of terrain are interspersed in a mosaic or repeating pattern the proportion of each component in the combination is given in a three-position designation set off by slashes denoting arbitrary percentage limits. For example, "Mv/D/R" means that at least 60% of the area is underlain by thin till, with up to 40% boggy areas, and less than 15% scattered rock outcrops. "Rc/R" indicates more than 60% bedrock concealed by vegetation and less than 15% outcrop.

Mean magnetic declination 1985, 15°06' East, decreasing 23.1' annually. Readings vary from 13°05' in the SE corner to 17°06' in the NW corner of the map area

Geological Survey of Canada
Resource Geophysics and Geochemistry Division
and
Saskatchewan Energy and Mines
Saskatchewan Geological Survey

CONTRACTORS

Sample collection by Marshall Macklin Monaghan Ltd., Toronto
Sample preparation by Golder Associates, Ottawa

Sediment chemical analysis by Barringer Magenta ltd., Rexdale, Ontario
Water chemical analyses by Barringer Magenta Laboratories (Alberta) Ltd., Calgary

Copies of map material and listings of field observations and analytical data, from which the material was prepared, may be available at users expense by application to:

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The data are also available in digital form. For further information please contact:

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pH in water
GSC OPEN FILE 1106
REGIONAL GEOCHEMICAL RECONNAISSANCE MAP 71-1984
CANADA - SASKATCHEWAN
MINERAL DEVELOPMENT AGREEMENT (1984-89)
LAKE SEDIMENT AND WATER GEOCHEMICAL SURVEY
NORTHEASTERN SASKATCHEWAN, 1984

Scale 1:250 000

Kilometres 5 0 5 10 15 20 Kilometres

Universal Transverse Mercator Projection

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LEGEND

Note: This legend is common for Regional Geochemical Reconnaissance Map 71-1984, Open File 1106

NEOHELIKIAN:HADRYNIAN

dd — **Diabase-gabbro**: fine to coarse grained, massive to weakly foliated ± olivine ± biotite ± hypersthene

PALEOHELIKIAN

ATHABASCA GROUP

Mf — **Manitou Falls Formation**: sandstone and conglomerate
Mfs: fluvial sandstone member, locally pebbly
Mfc: conglomerate member

LATE APHEBIAN (HUDSONIAN)

x — **Cataclasite**: mylonite and sheared rocks of the Needle Falls Shear Zone, derived from rocks of the Wollaston and Peter Lake Domains

WOLLASTON DOMAIN

LATE APHEBIAN (HUDSONIAN)

Wpeg — **Granitic pegmatite**: variable grain size, generally massive, ± biotite ± muscovite ± garnet; contacts with migmatitic supracrustal gneisses commonly gradational

Wg — **Granite and alaskite**: fine to coarse grained, massive to weakly foliated; ± biotite ± hornblende ± magnetite ± microcline megacrysts; contacts with migmatitic supracrustal gneisses commonly gradational

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

EARLY TO MIDDLE APHEBIAN

Wollaston Group

Wsh — **Quartz-muscovite schist**: pelitic to psammopelitic; fine to medium grained, ± biotite; locally intensely sheared

Wch — **Calc-silicate gneiss, marble and amphibolite**: medium grained to pegmatitic; variable composition and texture, ± diopside ± biotite ± hornblende ± biotite ± actinolite/tremolite ± calcite ± scapolite ± grossularite; occurring as conformable bands and lenses in supracrustal sequence

Wmi — **Meta-arkosic gneiss**: fine to medium grained, massive to foliated to gneissic, locally layered, ± biotite ± hornblende ± diopside ± muscovite ± sillimanite ± garnet; commonly interlayered with psammitic gneiss and with metaquartzite, pelite and calc-silicate rock; commonly anatectic with more than 50 percent leucogranitic neosome

Wmg impure metaquartzite

Wpsm — **Pelitic to psammopelitic gneiss**: fine to medium grained foliated to gneissic, locally layered, ± biotite ± hornblende ± diopside ± sillimanite ± muscovite ± cordierite ± garnet ± graphite/graphitic; interlayered metaquartzite, meta-arkose, calc-silicate rock and marble with psammitic types locally abundant; commonly anatectic with more than 50 percent leucogranitic to tonalitic neosome

Wgf graphite-bearing pelitic gneiss

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; ± muscovite ± biotite ± garnet ± feldspar ± sillimanite; commonly interlayered with psammitic gneiss; interlayered graphitic meta-argillite ± andalusite ± garnet ± sulphide

PROBABLY EARLY APHEBIAN (LATE ARCHEAN?)

Wr — **Meta-arkose**: fine to medium grained, massive to foliated, locally layered and cross stratified, ± muscovite ± magnetite ± biotite fragments; local conglomerate with granitic granite gneiss, metavolcanic and metasedimentary clasts; ± interbedded pelitic schist ± andalusite ± staurolite ± garnet

Wv — **Amphibolite**: fine grained, massive to poorly foliated, locally pillowed; local intercalated pelitic gneiss

COURTENAY CAIRNS LAKE BELT

UNCONFORMITY

ARCHEAN, DEFORMED AND METAMORPHOSED WITH APHEBIAN SUPRACRUSTAL ROCKS DURING THE HUDSONIAN OROGENY

Wfm — **Felsic granitoid gneiss**: fine to coarse grained, foliated to gneissic, generally homogeneous rocks of syenogranitic to granodiorite composition ± biotite ± amphibole ± sillimanite; with rare hypersthene (of granulite facies assemblage) ± garnet ± cordierite; commonly anatectic and/or pelitic schist; locally partially anatectic with leucogranite neosome

Wfb biotite-hornblende bearing

ROTTENSTONE DOMAIN

APHEBIAN (HUDSONIAN) WITH POSSIBLE ARCHEAN ELEMENTS

WATHAMAN BATHOLITH (c.1880 Ma)

Rgp — **Megacrystic granitoid**: medium to coarse grained, massive to foliated; grey to buff; biotite ± hornblende ± muscovite ± megacrysts ± biotite ± hornblende quartz monzonite, monzogranite and granodiorite; local pelite, amphibolite and/or metaquartzite xenoliths; locally abundant pegmatite, aplite and non-megacrystic granitoid toward margins

Rgps: sheared variants, with strongly foliated groundmass and flattened microcline megacrysts; locally submylonitic

Rgm — **Monzogranite-granodiorite**: containing abundant xenoliths and rafts of amphibolite and amphibole gneiss derived from unit Pn

Rbd — **Quartz monzodiorite, diorite and gabbro**: fine to coarse grained, massive to foliated; ± hornblende ± plagioclase ± potassium feldspar ± quartz ± biotite; local paragneiss inclusions; contact zones commonly injected with granitic material

Rpeg — **Granitic pegmatite**: massive to foliated; ± biotite ± muscovite ± hornblende ± garnet

ROTTENSTONE MIGMATITE COMPLEX

Rgt — **Tonalite, granodiorite and trondhjemite**: compositionally variable, but generally leucocratic; massive to foliated to coarse grained, locally pegmatitic, massive to foliated; ± biotite ± muscovite ± garnet ± hornblende; local amphibolite and/or pelite inclusions

Rgtz: metasomatized leucotonalite, pink, massive porphyroblastic, with introduced potassium feldspar and quartz in aureole of Wathaman Batholith

Ring — **Amphibolite and derived migmatite**: paleosome fine to medium grained, foliated, locally layered, ± hornblende ± feldspar ± biotite ± muscovite ± garnet ± quartz; local pelitic to psammitic gneiss and calc-silicate gneiss; neosome leucocratic, variable composition and texture, 10 to 50 percent of unit; medium to coarse grained to pegmatitic, massive to foliated; ± biotite ± muscovite ± garnet ± hornblende

Rmg — **Pelitic to psammitic gneiss and derived migmatite**: paleosome fine to medium grained, well foliated to gneissic, locally layered, ± biotite ± quartz ± feldspar ± muscovite ± sillimanite ± cordierite ± garnet; interlayered with graywacke or tonalitic gneiss; 10 to 50 percent of unit; medium to coarse grained to pegmatitic, massive to foliated; ± biotite ± muscovite ± garnet ± hornblende

PETER LAKE DOMAIN

APHEBIAN AND ARCHEAN ROCKS, STRONGLY REWORKED PROBABLY LATE IN THE HUDSONIAN

Pa — **Mylonite**: fine grained to aphanitic, streaky to finely laminated; interlayered mafic and felsic gneiss

PARKER LAKE GNEISSES

Pgn — **Felsic gneiss**: medium grained, strongly foliated to gneissic; locally submylonitic granitoid rock ± biotite ± hornblende ± flattened microcline megacrysts

Pn — **Hornblende-biotite gneiss**: tonalitic to gabbroic composition, medium to coarse grained, with minor metagabbro and amphibolite

Pgm — **Mafic gneiss**: fine to medium grained, foliated to gneissic; locally submylonitic; ± hornblende ± plagioclase ± biotite ± quartz ± potassium feldspar; local pods of weakly foliated to massive mafic rock

Pmg: area cut by numerous granitic dykes and sills likely derived from the Wathaman Batholith

HUDSONIAN WITH POSSIBLE ARCHEAN ELEMENTS

PETER LAKE COMPLEX

Pg — **Felsic granitoid**: generally medium to coarse grained, locally foliated to gneissic; granodiorite to syenogranite ± biotite ± alaskitic and aplitic; local relict igneous textures, generally only weakly foliated except in discrete shear zones; ± biotite ± amphibole; local amphibolite and/or pelitic inclusions

Pgl: late granodioritic to alaskitic and aplitic intrusive sheets

Pgp — **Megacrystic granitoid** (intrusingsubsolvie in places from unit Pgp)

Pgps: sheared variants

PROBABLY MAINLY ARCHEAN

Pbg — **Mafic plutonic rocks**: fine to coarse grained, massive to foliated, locally layered, metamorphic to retrograde to metagabbro; local relict ophitic to subophitic texture; ± hornblende ± plagioclase ± biotite ± actinolite/tremolite, with local metasedimentary xenoliths;

includes amphibolitic rocks of possible metavolcanic origin

Pfa: layered metagabbro, minor anorthosite, ultramafic rock and granodiorite

Pbp: megacrystic diorite; massive with potassium feldspar megacrysts

Pnf — **Quartzofeldspathic gneiss**: fine to medium grained, equigranular, generally well foliated to gneissic, locally submylonitic; granodiorite to syenogranite ± biotite ± hornblende; local biotite-hornblende gneiss lenses

Campbell River Group

Psa **Slate, phyllite and biotite schist**: very fine to fine grained, well foliated; locally layered; ± biotite ± muscovite ± pyrite/pyrrhotite ± carbonaceous material; local hornblende-biotite schist; psammite, amphibolite and metagabbro

SYMBOLS

- Single bedrock exposure: approximate area of abundant bedrock exposure
- Geological contact: defined to approximate; inferred
- Structural lineament: possible to probable fault, as interpreted from geological, geophysical and/or airphoto evidence
- Major fold axial trace: anticline; synform
- Trend and approximate dip of dominant foliation surface: dip shallow (0-20°); moderate (20-50°); steep (60-84°); subvertical (85-90°)
- Mineral prospect
  1. George Lake; 2+-Pb (Karup-Møller and Brummer, 1970; Coombe, 1971)
- Sample location (geochronology)
  1. 1700-1800 Ma, Rb-Sr whole rock (Wanless et al., 1970)
  2. 1780-30 Ma, Rb-Sr whole rock isochron (Bell and Macdonald, 1980); map location is approximate centre of collecting area
- * No analytical result

* A mnemonic name recorded as rock types as part of field observations

This legend was modified and the geology derived for these geochemical maps from Compilation Bedrock Geology Series 228A, 229A and 230A, Saskatchewan Energy and Mines, Saskatchewan Geological Survey

This map forms one of a series of maps released by the Geological Survey of Canada, Open File 1106. The Open File consists of maps of various geochemical variables: 16 for lake sediment, 3 for lake water and 1 sample site location

pH in water
GSC OPEN FILE 1106
NORTHEASTERN SASKATCHEWAN, 1984

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