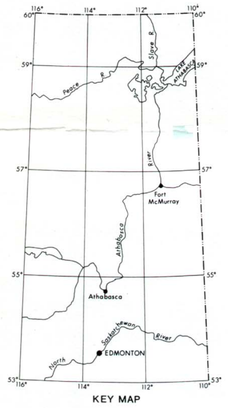
RESEARCH COUNCIL OF ALBERTA

# GEOLOGY OF THE MARGUERITE RIVER DISTRICT, ALBERTA

R 5 R 4 R 3 R 2

Tp 103 Tp 102 Tp 101 Tp 100




KEY MAP

Approximate magnetic declination 24° 12' in 1970 decreasing 6.5' annually

## LEGEND

- Schistosity, gneissosity, foliation (defined, dip known, dip vertical, assumed)
- Schistosity, gneissosity, foliation trend*
- Lineation (combined with schistosity, etc.)
- Fault (defined, dip known, assumed)
- Shear
- Breccia
- Joint (dip known, vertical, unknown)
- Gossan
- Rock alteration
- Gneissic phase of rock units
- Anomalous radioactivity (over 2x background)
- Yellow stain
- Yellow stain with anomalous radioactivity
- Carbonate bedrock limit and/or relief trend*
- Drumlin, drumlinoid feature*
- Glacial fluting, giant groove*
- Glacial striae
- Crag and tail*
- Esker (direction of water flow unknown) or crevasse filling*
- Muskeg
- Dune (wind direction shown)*
- Wind-cut grooves (wind direction shown)
- Drainage (permanent, intermittent)
- Township boundary
- Outcrop boundary†

† Boundary of bedrock area designated by patterned symbols; color wash limits define other outcrop areas.

*aerial photographic interpretation

Geology by J. D. Godfrey, 1969

Map drawn by F. L. Copeland

Cartographic editing by J. E. Gould

Air photographs covering this area are obtainable from the Technical Division, Alberta Department of Lands and Forests, Edmonton and the National Air Photographic Library, Ottawa.

SCALE — 1: to 63,360
1 Inch to 1 Mile

1 0 1 2 3

## PRECAMBRIAN*

*PORPHYROBLASTIC BIOTITE MICROGRANODIORITE:* range from dark- to light-colored, i.e. mafic-rich to mafic-poor; biotite, white feldspars and quartz common throughout; locally scattered minor garnet or garnet-chlorite clots and agglomerates up to 1mm diameter in the mafic-poor phases; rock generally fine to medium grained; some megacrystic feldspars (1 to 2mm diameter) in finer-grained mafic-rich phase, both megacrysts (1.5 to 2.5mm diameter) and matrix coarser grained in the mafic-poor phase; typically foliated, extreme mafic-poor phase locally massive; rock commonly cataclastically deformed to some degree, ranging from mildly sheared to mortar structured to mylonitic

*PORPHYROBLASTIC BIOTITE MESOGRANODIORITE TO MESO QUARTZ MONZONITE:* ranges from dark- to light-colored, i.e. mafic-rich to mafic-poor; biotite, white feldspars and quartz common throughout, hornblende in mafic-rich phase only; scattered garnet-biotite-chlorite agglomerates up to 13mm diameter in the mafic-poor phase; locally minor light green feldspars, especially in the mafic-rich phase; rock typically medium grained, abundant megacrystic feldspars (3 to 7mm diameter) in finer-grained mafic-rich phase but less common in coarser-grained mafic-poor phase; moderately foliated, extreme mafic-poor phase tends to be massive; rock commonly cataclastically deformed to some degree, ranging from mildly sheared to mortar structured to mylonitic

*PORPHYROBLASTIC BIOTITE GRANODIORITE TO QUARTZ MONZONITE TO GRANITE:* ranges from medium grey to white, i.e. moderately mafic-rich to mafic-poor (leucocratic); biotite, white feldspars and quartz common throughout; scattered garnet-chlorite agglomerates up to 12mm diameter in the mafic-poor phase; locally minor light green feldspars especially in the mafic-rich phase; rock typically coarse grained, locally pegmatitic in leucocratic phase, numerous megacrystic feldspars (5 to 20mm diameter) in the mafic-rich phase; poorly foliated to massive in the mafic-rich phase, mainly massive in leucocratic phase but tabular feldspars locally aligned; rock can be cataclastically deformed, ranging from mildly sheared to mortar structured

*LEUCOCRATIC MESOGRANITE:* white to creamy pink; white to pink feldspars and quartz, typically with minor garnet or garnet-chlorite-mica agglomerates; rock medium grained, commonly some megacrystic feldspars (5 to 10mm diameter), garnets medium to coarse grained; rock typically massive or poorly lineated to foliated due to quartz grain alignment; rock can be cataclastically deformed, ranging from mildly sheared to mortar structured

*LEUCOCRATIC GRANITE TO PEGMATITE:* white to creamy pink; white to pink feldspar and quartz, typically with minor garnet or garnet-chlorite agglomerates; rock coarse grained to pegmatitic, garnets medium to coarse grained; typically massive or poorly lineated to foliated due to quartz grain alignment; rock can be cataclastically deformed, ranging from mildly sheared to mortar structured

*"DARK" MYLONITE:*

A - homogeneous texture: (i) *ultramylonite:* dark grey, glassy, homogeneous on fresh surface; showing wavy fine grey bands on weathered surface; commonly gradational to B(below); (ii) *recrystallized medium-grey mylonite:* glassy, very poor foliation, lineation-foliation can be most evident on weathered surface; commonly gradational to B or C(below)

B - porphyroclastic structure: dark to medium grey, feldspar porphyroclasts typically from 4 to 13mm diameter, aligned in ultra fine-grained, foliated matrix; mortar structure; commonly gradational to A(above) or C(below)

C - recrystallized, distinctly foliated-lineated: medium grey; feldspars and quartz with biotite; well-developed, relatively coarse foliation-lineation of mafic-mineral aggregates with tendency to banding, spotted with feldspar porphyroclasts typically from 4 to 8mm diameter; commonly gradational to B or Aii(above)

*"LIGHT" MYLONITE:*

A - homogeneous texture: white to light grey, feldspars and quartz with uncommon garnet; tendency towards porphyroclastic structure and some quartz banding or foliation; commonly gradational to B or C(below)

B - porphyroclastic structure: white to pink to light grey; feldspars and quartz with minor garnet; abundant feldspar porphyroclasts from 2 to 15mm diameter in foliated, locally banded matrix; mortar structure; commonly gradational to A(above)

C - recrystallized, distinctly lineated-foliated: white to pink, mottled dark; feldspars and quartz with biotite and minor garnet; a well-developed, relatively coarse lineation-foliation of mafic-mineral aggregates; commonly gradational to A(above)

*AMPHIBOLITE:* dark green, hornblende, biotite and light green feldspars; rock fine to medium grained; massive to slightly banded, especially evident on weathered surface

*RED MESOGRANITE:* deep pink to brick red; pink to red (hematite-colored) feldspars, quartz and minor chlorite; rock fine to medium grained; foliated, locally massive; cataclastic structure common with feldspar porphyroclasts ranging from 1 to 3mm diameter

*MASSIVE BIOTITE MESOGRANITE:* light to deep pink; feldspars, quartz, minor biotite with some garnet-chlorite-biotite clusters from 1 to 7mm diameter; few megacrystic feldspars from 4 to 10mm diameter; rock typically medium grained; commonly very poorly foliated due to alignment of quartz grains and biotite; locally massive

*ARCH LAKE-TYPE GRANITE TO GRANODIORITE:* pink to red; white to red feldspars, quartz and minor biotite; rock coarse grained; many tabular megacrystic feldspars from 6 to 15mm diameter, typically aligned subparallel; megacrystic feldspars plus streaky mafic mineral aggregates can form crude foliation, otherwise massive

*HORNBLENDE MICRO QUARTZ MONZONITE:* dark, mottled pink; pink to green to red feldspars, hornblende, biotite, minor quartz and locally garnet; rock medium to coarse grained; poorly foliated to massive

*FOLIATED HORNBLENDE MESO QUARTZ MONZONITE:* medium tone, mottled pink and white spots plus dark streaks; pink and white feldspars, hornblende, minor biotite and quartz; rock typically coarse grained, few feldspar megacrysts from 4 to 15mm diameter; foliation typically distinct; may be locally sheared

Undifferentiated bedrock outcrop

*Note: Rock units are not arranged chronologically.

Base map taken from planimetric sheets published by Alberta Department of Lands and Forests, Edmonton.

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