



101°52'55"W

101°52'50"W

101°52'45"W

# Geology of the South Main shaft area, Flin Flon, Manitoba (parts of NTS 63K12NW and 63K13SW)

## Legend

### PALEOPROTEROZOIC

#### < 1.845 GA INTRUSIVE ROCKS AND TECTONITES

##### TECTONITES

- T1 Mafic tectonite (age unknown)
- T1a mylonite
- T1b phyllonite

##### POST-MISSI INTRUSIVE ROCKS (<1.845 GA ROCKS)

- ZZ Boundary intrusions:
  - Z2a melagabbro, pyroxenite
  - Z2b monzonite-syenite
  - Z2c intrusion breccia
- Z1 Phantom Lake intrusions:
  - Z1a fine- to medium-grained quartz-feldspar porphyry, massive to banded
  - Z1b granodiorite, quartz diorite

##### FLIN FLON ARC ASSEMBLAGE (>1.88 GA ROCKS)

#### SYNOVOLCANIC INTRUSIVE ROCKS (includes intrusions of uncertain age)

- D4 Gabbro dikes and sills
  - D4a fine to medium grained
  - D4b aphanitic, aphyric to sparsely porphyritic
- D3 Aphanitic intermediate dikes and sills
  - D3a amphibole-phyric andesite
- D2 Aphanitic rhyolite-rhyodacite dikes and sills
  - D2a aphyric
  - D2b quartz (feldspar) phryic
- D1 Aphanitic to medium-grained mafic dikes and sills
  - D1a aphanitic, aphyric to sparsely feldspar porphyritic (<5% phenocrysts), massive to amygdaloidal (<5% amygdaloids)
  - D1b flow banded, aphanitic, aphyric to sparsely feldspar phryic (<5% phenocrysts), massive to amygdaloidal (<5% amygdaloids)
  - D1c aphanitic, aphyric, magnetite-bearing
  - D1d aphanitic to medium grained, feldspar phryic (8-15%, 2-10mm)
  - D1e aphanitic to medium grained mega-feldspar phryic (15-30%, 5-15mm)
  - D1f medium grained to aphanitic, pyroxene- (feldspar) phryic
  - D1g massive to flow banded, fine to medium grained, equigranular (possible sill of massive flow)

#### HIDDEN FORMATION

##### Bomber Member

- O2 Mafic volcaniclastic rocks
  - O2a thin-bedded basaltic-andesite tuff with local interbeds of quartz crystal rhyolite tuff
  - O2b lapilli tuff to lapillistone containing quartz-phyric rhyolite clasts
  - O2c lapillistone to lapilli tuff containing andesite to basaltic clasts and scoria
  - O2d plane bedded, thin- to thick-bedded mafic tuff
  - O2e amoeboid breccia, rare clasts of peperite
- O1 Mafic flows, includes cryptoflows and peperite
  - O1a aphyric to sparsely feldspar phryic (<5%), massive, quartz amygdaloidal; includes megapillows, feeders and cryptoflows
  - O1b aphyric to sparsely feldspar phryic (<5%), pillowed, quartz amygdaloidal, may contain prominent radial pipe vesicles
  - O1c feldspar phryic (15%, <4mm), massive
  - O1d feldspar phryic (15%, <4mm), pillowed
  - O1e in situ brecciated to clast-rotated breccia ± bedded tuff
  - O1f peperite
  - O1g feldspar phryic (15%, <4mm), amoeboid breccia
  - O1h unsubdivided

#### FLIN FLON FORMATION

##### Millrock Member

- M6 Monolithologic mafic volcaniclastic rocks
  - M6a massive to thin-bedded tuff, local basalt scoria, rusty weathering
  - M6b lapilli-tuff to lapillistone containing up to 30 cm diameter, subrounded to angular scoriaeous to sparsely amygdaloidal (5%) mafic clasts, matrix supported, no observed bedding
- M5 Heterolithologic mafic volcaniclastic rocks; dominant clast types are subrounded to angular, aphanitic, sparsely amygdaloidal to scoriaeous, aphyric to feldspar phryic mafic types ranging from 2 mm to 0.8 m in size; matrix may contain sparse feldspar phenocrysts
  - M5a basalt tuff, massive or thick bedded to laminated
  - M5b lapilli tuff, massive to thick bedded
  - M5c lapillistone, massive to thick bedded
  - M5d tuff breccia, massive
- M4 Heterolithologic volcaniclastic rocks
  - M4a rhyolite-dominated lapillistone to tuff breccia; clast types include quartz- (± feldspar) phryic rhyolite and sparsely amygdaloidal to scoriaeous aphyric basalt (clasts range from cm to m in size)
  - M4b basalt-dominated heterolithologic lapilli tuff to tuff breccia; clast types include sparsely amygdaloidal and scoriaeous aphyric basalt and quartz phryic (± feldspar) rhyolite
  - M4c quartz-bearing intermediate to felsic wacke, local rhyolite clasts
- M3 Monolithologic felsic volcaniclastic rocks
  - M3a massive to bedded quartz-phyric lapillistone to blocky breccia; clasts are subangular to angular, scoriaeous to pumiceous and framework supported, may include up to 5% basalt clast
  - M3b massive to bedded aphyric to sparsely quartz-phyric lapillistone to blocky breccia; clasts are subangular to angular, scoriaeous to pumiceous and framework supported, may include up to 5% basalt clast
- M2 Coherent rhyolite flows, domes and cryptodomes
  - M2a quartz (feldspar) phryic, massive to in situ brecciated, may be flow banded
  - M2b aphyric to sparsely quartz (feldspar) phryic, massive to in situ brecciated, may be flow banded
  - M2c quartz (feldspar) phryic monolithologic autoclastic breccia, pumiceous clasts
  - M2d aphyric to sparsely quartz (feldspar) phryic monolithologic autoclastic breccia, pumiceous clasts
- M1 Basalt flows and cryptoflows
  - M1a pillowed, aphanitic, sparsely amygdaloidal
  - M1b massive, aphanitic, amygdaloidal, possible cryptoflow
  - M1c pillowed, plagioclase-phyric, sparsely amygdaloidal

##### Creighton Formation

- A2 Monolithologic mafic volcaniclastic rocks
  - A2a amoeboid breccia characterized by irregular aphyric to sparsely feldspar-phryic (<5%) fragments with distinct chilled margins (less than 5% are broken); fragments are typically scoriaeous (>25% quartz amygdaloids but range from 5 to 50%)
- A1 Aphyric to sparsely (<5%) feldspar-phryic basalt flows
  - A1a pillowed, aphanitic, amygdaloidal
  - A1b massive, aphanitic, amygdaloidal
  - A1c autoclastic breccia (flow top), angular to amoeboid fragments of amygdaloidal to scoriaeous basalt (framework to matrix supported)

## Symbols

### Contacts

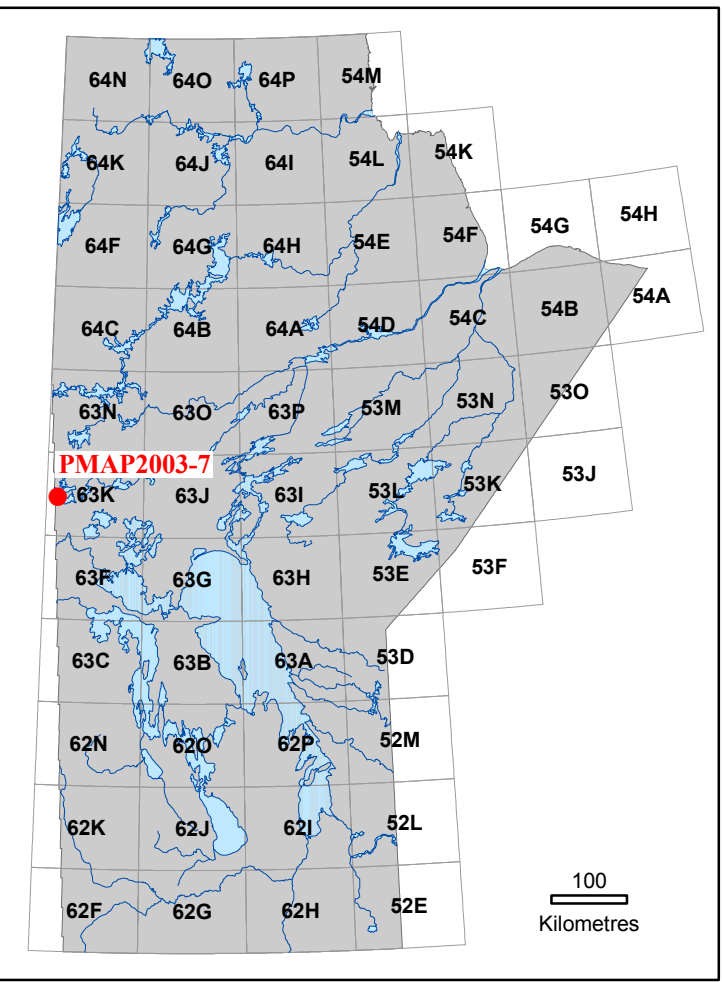
- defined
- approximate
- assumed
- fault
- flow banding
- outcrop
- Bedding: tops overturned, tops unknown
- Pillows: tops upright
- Flow contact: tops upright
- Foliation: generation 1, generation 2, generation unknown
- Lineation: generation 2, generation unknown
- Intersection lineation: generation 2
- Shear zone: sense unknown, dextral, sinistral

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Published by: Manitoba Industry, Economic Development and Mines  
Manitoba Geological Survey, 2003  
This map is a provisional summary of work carried out during the summer field season and is produced directly from the geologist's manuscript. It is not to be regarded as an interpretation of the geology of the area.  
Suggested references:  
Bailes, A.H., Bray, D. and Syme, E.C. 2003. Geology of the South Main shaft area, Flin Flon, Manitoba (parts of NTS 63K12NW and 63K13SW); Manitoba Industry, Economic Development and Mines, Manitoba Geological Survey, Preliminary Map PMAP2003-7, scale 1:500.



1:500

