Open File OF2022-2

Hudson Bay

Scale 1:1 000 000

0 10 20 40 60 80 100 kilometres

Scale 1:4 500 000

0 50 100 150 200 kilometres

Major Geological Subdivisions

Legend

Phanerozoic

- Cenozoic
- Mesozoic
- Paleozoic

Precambrian

- Reindeer zone (Proterozoic)
- Hearne boundary zone (Archean-Proterozoic/Proterozoic)
- Superior boundary zone (Archean/Archean-Proterozoic/Proterozoic)
- Superior craton (Archean)

Lithological type (Precambrian)

- Volcanic-plutonic (VP)
- Volcanic-plutonic, granulite facies (VPg)
- Batholithic granitoid
- Sedimentary-plutonic (SP)
- Sedimentary-volcanic (SV)
- VP basement, SP cover
- VPg basement, SP cover
- VPg basement, SV cover

Legend

PHANEROZOIC

WILLISTON BASIN

Cenozoic

Tertiary

- TW — Wynyard Formation: sand; silt
- TTM — Turtle Mountain Formation: bentonitic carbonaceous sand; silt; clay; thin lignite beds; silty shale; minor sand

Mesozoic

Upper Cretaceous

- KB — Boissevain Formation: sandstone; minor shale; in places kaolinitic
- KP — Pierre Shale: interbedded soft and hard calcareous shale; bentonite; siltstone; mudstone. Coulter Member (c); Odanah Member (o); Millwood Member (m); Pembina Member (p); Gammon Ferruginous Member (g)
- KC — Carlile Formation: grey calcareous speckled shale; siltstone; black carbonaceous shale; bentonite
- KF — Favel Formation: calcareous speckled shale; minor limestone; calcarenite; bentonite; oil shale

Upper and Lower Cretaceous

- KA — Ashville Formation: grey to black non-calcareous shale; bentonite; sand; siltstone

Lower Cretaceous

- KSR — Swan River Formation: sandstone, in places glauconitic; kaolinitic shale; minor lignite

Jurassic

- JM — Melita Formation: varicoloured calcareous shale; dense limestone; minor sandstone
- JR — Reston Formation: grey shale; dense argillaceous limestone; oolitic to sandy beds
- JAU — Amaranth Formation, upper member: gypsum and anhydrite

Triassic

- TAl — Amaranth Formation, lower member: red, argillaceous, dolomitic siltstone and sandstone

Lake St. Martin Structure (meteorite impact?): Ordovician to Jurassic

- Jur-Ev — Jurassic Amaranth Formation, Upper (Evaporite) Member: thick gypsum and anhydrite
- Tr-Red — Triassic Amaranth Formation, Lower (Red Beds) Member: red, argillaceous, dolomitic siltstone and sandstone
- Perm-Gr — Permian intrusive rocks: granitic microbreccia crater-fill
- Perm-V — Permian volcanic rocks: trachyandesite
- Dev — Devonian: limestone; limestone breccia crater-fill
- Ord-Sil — Ordovician and Silurian: dolostone; dolostone breccia crater-fill

Paleozoic

Upper and Middle Devonian

- DD — Duperow Formation: limestone and dolostone; argillaceous and anhydritic in places
- DS — Souris River Formation: basal red shale; high-Ca micritic limestone; limestone; dolostone

Middle Devonian

- DDB — Dawson Bay Formation: basal red shale; bituminous dolostone; high-Ca micritic limestone; shale; highly fossiliferous high-Ca limestone, locally dolomitized
- DE/DW — Elm Point Formation (DE): limestone; pure high-Ca limestone to calcareous dolostone. Winnipegosis Formation (DW): dolostone; bituminous laminates; reefal limestone
- DA — Ashern Formation: dolomitic shale and argillaceous dolomite; red to greenish grey; local basal breccia

Silurian

- SI — Interlake Group: micritic to fossiliferous dolostone; sandy argillaceous marker beds

Ordovician and Lower Silurian

- SOS — Stonewall Formation: dolostone; sandy argillaceous beds marker (t-marker) may define the Ordovician-Silurian boundary

Upper Ordovician

- OSM — Stony Mountain Formation: calcareous shale; fossiliferous limestone; argillaceous dolostone; sandy in places
- ORR — Red River Formation: dolostone, argillaceous to sandy in places; high-Ca limestone; anhydrite
- OW — Winnipeg Formation: sandstone; shale

HUDSON BAY BASIN

Upper Devonian

- DMR — Moose River Formation: limestone; dolostone; shale; evaporites
- DKW — Kwataboahegan Formation: fossiliferous and bituminous limestone; dolostone

Lower Devonian

- DSR — Stooping River Formation: limestone, dolomitic in places; dolostone, argillaceous in places
- DKRU — Kenogami River Formation, upper member: limestone; dolomitic limestone

Silurian

- SKR — Kenogami River Formation: middle member (m), dolomitic silty shale/mudstone; siltstone; anhydrite. Lower member (l), dolomitic limestone
- SER — Ekwan River Formation: limestone; dolomitic limestone
- SAT — Attawapiskat Formation: fossiliferous limestone; dolomitic limestone
- SSR — Severn River Formation: limestone; dolomitic limestone; argillaceous dolostone

Ordovician and Lower Silurian

- ORH — Red Head Rapids Formation: dolostone; argillaceous dolostone; anhydrite; halite

Upper Ordovician

- OCR — Churchill River Group: dolomitic limestone; limestone
- OBR — Boas River Formation: argillaceous dolostone
- OBC — Bad Cache Rapids Group: basal sandstone and shale; limestone; dolostone, argillaceous dolostone; chert; anhydrite

Geological symbols

Point features

- Carbonatite
- Ultramafic rocks from drillhole
- Ultramafic rocks

Linear features

- Diabase, diorite, Molson dike
- Mackenzie dike
- Fault
- Phanerozoic-Precambrian boundary
- Geological contact
- Iron formation

Topographic symbols

- Rail
- Road
- Winter road

PROTEROZOIC

Sedimentary rocks

- pS — Quartzofeldspathic sandstone
- pW — Argillaceous sandstone to mudstone (e.g., turbidites)
- pC — Conglomerate
- pF — Iron formation
- pK — Calcsilicate rock; marble; dolomitic marble
- pP — Mudstone

Volcanic rocks

- pV — Undifferentiated volcanic rocks
- pV1 — Felsic volcanic rocks
- pV2 — Intermediate volcanic rocks
- pV3 — Mafic volcanic rocks

Intrusive rocks

- pX — Pegmatite
- pG — Granite to granodiorite
- pZ1 — Monzodiorite to quartz monzodiorite
- pZ2 — Monzonite
- pZ3 — Syenite
- pR — Felsic porphyritic rocks (e.g., hypabyssal)
- pT — Granodiorite to tonalite
- pD — Diorite; quartz diorite
- pB — Gabbro; diabase; diorite; norite
- pI — Anorthositic gabbro; anorthosite
- pU — Ultramafic rocks

Metamorphic rocks

- pY — Metasedimentary rocks
- pA — Amphibolite
- pM — Mylonite; tectonite; cataclastite
- pN1 — Felsic gneiss
- pN2 — Intermediate gneiss

PROTEROZOIC AND/OR ARCHEAN

Sedimentary rocks

- uC — Conglomerate
- uW — Argillaceous sandstone to mudstone

Volcanic rocks

- uV — Undifferentiated volcanic rocks
- uV3 — Mafic to ultramafic volcanic rocks

Intrusive rocks

- uG — Granite to granodiorite
- uT — Granodiorite to tonalite
- uB — Gabbro; diabase; diorite; norite

Metamorphic rocks

- uY — Metasedimentary rocks
- uN — Felsic gneiss

ARCHEAN

Sedimentary rocks

- aS — Quartzofeldspathic sandstone
- aW — Argillaceous sandstone to mudstone (e.g., turbidites)
- aC — Conglomerate
- aP — Mudstone

Volcanic rocks

- aV — Undifferentiated volcanic rocks
- aV1 — Felsic volcanic rocks
- aV2 — Intermediate volcanic rocks
- aV3 — Mafic volcanic rocks

Intrusive rocks

- aX — Pegmatite
- aG — Granite to granodiorite
- aZ1 — Monzodiorite to quartz monzodiorite
- aZ2 — Monzonite
- aZ3 — Syenite
- aR — Felsic porphyritic rocks (e.g., hypabyssal)
- aT — Granodiorite to tonalite
- aD — Diorite; quartz diorite
- aB — Gabbro; diabase; diorite; norite
- aI — Anorthositic gabbro; anorthosite
- aU — Ultramafic rocks

Metamorphic rocks

- aY — Metasedimentary rocks
- aA — Amphibolite
- aN1 — Felsic gneiss
- aN2 — Intermediate gneiss
- aN3 — Mafic gneiss

Total field magnetics (nT): High: 32233; Low: -6050

Bouguer gravity (mGal): High: 1.98; Low: -93.50

Elevation (m asl): High: 795; Low: 1

UTM Zone 14, NAD83

Project Number: MGS2022_008

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Bedrock geology of Manitoba

Geology by Manitoba Geological Survey

Phanerozoic edges by Nicolas et al. (2010, 2014)

GIS processing and digital cartography by H.O. Adediran and L.E. Chackowsky

Digital topographic base is from the CanVec+ data model, Natural Resources Canada (hydrographic features), and the Manitoba Land Initiative, Manitoba Environment, Climate and Parks.

Suggested reference:
Manitoba Geological Survey 2022: Bedrock geology of Manitoba; Manitoba Natural Resources and Northern Development, Manitoba Geological Survey, Open File OF2022-2, scale 1:1 000 000.

References

Nicolas, M.P.B., Lavoie, D. and Harrison, J. 2014: Introduction to the GEM-2 Hudson–Ungava Project, Hudson Bay Lowland, northeastern Manitoba; *in* Report of Activities 2014, Manitoba Mineral Resources, Manitoba Geological Survey, p. 140–147, URL <https://manitoba.ca/iem/geo/field/roa14pdfs/GS-12.pdf> [September 2022].

Nicolas, M.P.B., Matile, G.L.D., Keller, G.R. and Bamburak J.D. 2010: Phanerozoic geology of southern Manitoba; Manitoba Innovation, Energy and Mines, Manitoba Geological Survey, Stratigraphic Map SM2010-1, 2 sheets, scale 1:600 000, URL <https://manitoba.ca/iem/info/libmin/SM2010-1.zip> [September 2022].

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Note: Supplementary digital data (i.e., additional toponomy, regulatory information, First Nations lands etc.) is available on the Manitoba Geological Survey's GIS Map Gallery at https://manitoba.ca/iem/geo/gis/index.html

Manitoba