

BIBIKWASIN LAKE

Areas of the map symbolized as "Unconsolidated sand and gravel deposits" display underlying rock types to portray the interpreted continuity of units, based on structural, aeromagnetic and topographic signatures. Rock types other than those shown may be present in these areas.

All data stations collected by the authors are plotted using GPS-based coordinates. This map also incorporates pre-GPS field data collected by Ross and Enslin (1973) and Mann (1993). The accuracy of field data stations that were included from maps or field notes of these sources is dependent on the original plotting accuracy. Mineral occurrences shown on this map are from the Newfoundland and Labrador Geological Survey's Mineral Occurrence Database System (MOCDS) (<http://www.gns.gov.nl.ca/geomoc/>), and non-spatialized assessment reports. The locations of most of these are dependent on aerial photo accuracy. MOCDS occurrences that were revisited by the authors and new mineral notations were located using GPS-based geographic coordinates.

The map is augmented by follow-up examination of stained rock slabs, petrographic thin sections and whole rock geochemical analyses. In many areas, geological boundaries are poorly constrained, approximated and extrapolated on the basis of outcrop distribution, topographic trends, structural observations and aeromagnetic data. Individual subsections locally consist of several different rock types. The unit nomenclature is based on what was interpreted to be the dominant rock type present. All rock types recorded from this individual section may be determined by consulting the "Unit designator" string for that locality given in the digital database. Discrepancies in rock names appear to fall outside areas those improved from stained slabs or thin sections have not been recognized in the digital database. Differences may be due to more refined descriptions or the sample and/or thin section may not be representative of the source material.

Field work in 2012 by T. van Nieuwland and C. Corcoran

Recommended citation

van Nieuwland, T.
2023. Geology of Bibikwasin Lake map area (NTS 13L07), central Labrador. Scale 1:50 000. Geological Survey, Department of Industry, Energy and Technology, Government of Newfoundland and Labrador. Map 2023-26. Open File 13L07/056

Geology compiled by T. van Nieuwland
Geological cartography by S. Mikheeva, K. Morgan and T. Sears

The digital topographic database map NTS 13L07 used here is available from the Surveyor General Branch, Natural Resources, Canada. Magnetic declination at centre of map is 20° 26' West (March 31, 2022).

Universal Transverse Mercator (UTM), Grid Zone 20, North American Datum (NAD) 27.
Elevations are in metres above sea level. Contour interval is 20 m.

Open File 13L07/056

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Photometry versions of parts of this map published in Current Research articles have included to note any differences between the current and preliminary versions of the map, unit designators and the legends (see van Nieuwland and Corcoran, 2013).

Map 2023-26 is thirteen of twenty (20) maps on the geology of the Seal Lake Group, including adjacent rocks of older tectonic provinces in central Labrador.

Department website: <https://gov.nl.ca/geology/>
Geological Survey website: <https://www.gov.nl.ca/geomoc/geosurvey/>
Email: geomoc@gov.nl.ca

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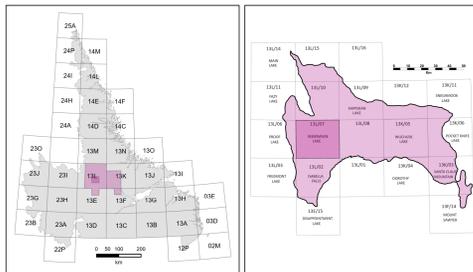
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2013. Geology of the western Mesoproterozoic Seal Lake Group, central Labrador (including all of NTS map areas 13L2 and 7 and parts of 13L1, 1, 3, 6, 9, 10, 11, 14, 15 and 16 and 18L04 and 15). In Current Research. Government of Newfoundland and Labrador, Department of Natural Resources, Geological Survey, Report 13-1, pages 301-336.

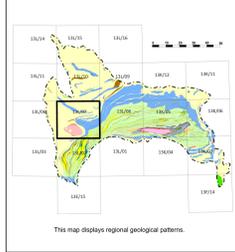
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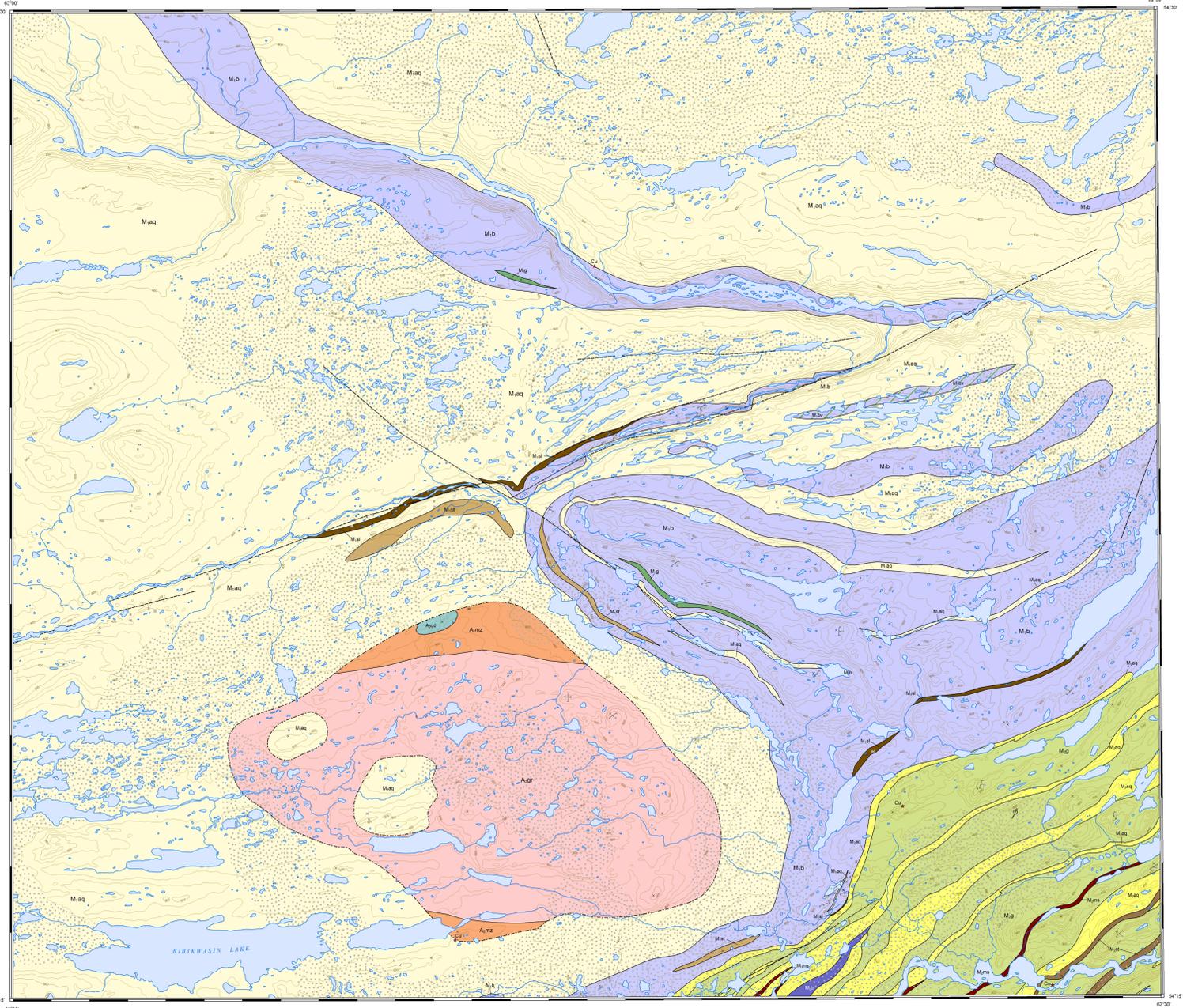
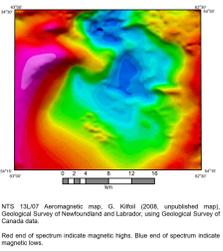
INDEX MAPS



REGIONAL GEOLOGY MAP



NTS 13L07 AEROMAGNETIC MAP



MIDDLE MESOPROTEROZOIC

Seal Lake Group (1271 ± 1 Ma)

Upper Red Quartzite Formation

M.aq¹ Red- to pink-weathering, fine- to medium-grained, well-sorted quartz arenite, arenite, and felsitic arenite. Contains local, cm- to scale lenses, and layers of fine-grained slate and siltstone, particularly in the lower levels of the formation.

M.aq² Fine-grained, maroon-weathering silt and siltstone. Occur as cm- to 10s of m-thick layers and lenses interbedded with quartz arenite near the base of the formation.

Adeline Island Formation

Upper Member

M.a1¹ Maroon- to red-weathering, fine-grained shale, locally grades to silt.

M.a1² Grey- to green-weathering, fine-grained slate.

M.a1³ Grey- to green-weathering, fine-grained slate, locally gradational to phyllite.

M.a1⁴ Red- to purple-weathering slate.

M.a1⁵ Grey-weathering, fine-grained sandy shale to silt.

M.a1⁶ Maroon- to purple-weathering, fine-grained slate.

M.a1⁷ Grey- to blue- to grey-weathering, fine-grained slate, gradational to phyllite. This unit exhibits a distinctive silver-grey sheen and host most of the copper sulfide mineralization within the Seal Lake Group.

M.a1⁸ Maroon- to purple-weathering, fine-grained slate.

Lower Member

M.a2¹ Pink- to red- to locally white-weathering variably recrystallized quartz arenite to arenite. This unit also contains local, thin lenses and lenses of slate.

M.a2² Lower Member

M.a2³ Maroon- to red-weathering, fine-grained slate. Basal unit of the Adeline Island Formation is locally intercalated with layers and lenses of fine-grained quartz arenite.

Salmon Lake Formation

M.s¹ Green- to brown-weathering, fine-grained, massive amygdaloidal basalt flows. Flows are 1- to 5-m thick, and intercalated with interbedded silt and phyllite.

M.s² Maroon- to red-weathering, fine-grained slate. Locally contains thin, fine-grained interbedded siltstone and quartz arenite.

M.s³ Grey- to green-weathering, fine-grained phyllite to silt.

M.s⁴ Grey- to brown-weathering, fine-grained breccias with fine stromatolite layers. Also occurs as thin lenses and layers interbedded with other sedimentary rock units.

M.s⁵ Pink- white- to grey-weathering, fine- to medium-grained variably recrystallized quartz arenite to arenite.

M.s⁶ Green- to brown-weathering, fine- to medium-grained, moderate to strongly foliated, massive and amygdaloidal basalt flows.

M.s⁷ Green- to brown- to rusty-weathering, fine- to medium-grained phyllite to equigranular gabbro. Occurs as tabular-shaped silt and small, irregular intrusions.

Whiskey Lake Formation

M.w¹ Brown- maroon- to red-weathering, thin-bedded to laminated slate, arenite, siltstone and subordinate calcareous rocks and chert.

M.w² Maroon-weathering, thin-bedded to laminated slate. Occurs predominantly as thin lenses and layers.

Wetluk Lake Formation

M.wl¹ Prominently pink- white, grey- to red-weathering variably recrystallized quartz arenite and arenite occurring as layers of variable thickness interbedded with gabbro silt and basalt flows. Contains cm- and metre- sized lenses of siltstone, mudstone and calcareous rocks.

M.wl² Brown- to tan-weathering, fine-grained, thin-bedded to laminated siltstone. Also contains thin quartz arenite, arenite, chert, and calcareous rocks.

M.wl³ Fine-grained, red- maroon- to brown-weathering mudstone, grading to shale and silt and having a weak to strongly developed S- and/or N-trending cleavage.

M.wl⁴ Black- to grey-weathering, fine-grained shale interbedded with siltstone and quartz arenite units. Exhibits localized and intermetre-scale radiating signatures (revisited by stromatolites on outcrop surfaces).

M.wl⁵ Brown- to grey-weathering, fine- to medium-grained, well-bedded to massive limestone. Occurs as m- to 10s of m-scale lenses and beds interbedded with other sedimentary rock units.

M.wl⁶ Green- grey- to brown- to red-weathering, fine- to medium-grained, moderate to strongly foliated, massive and amygdaloidal basalt flows.

M.wl⁷ Green- to grey-weathering, fine- to medium-grained, massive to strongly foliated quartz gabbro. Rocks are exposed as tabular-shaped silt. Contains local woodblock and leucocrone zones. Some silt may consist of composite intrusions.

Majors and Bessie Lake formations (stratigraphically equivalent formations)

M.m¹ Brown- to maroon-weathering, fine-grained slate. Locally interbedded with quartz arenite, arenite and siltstone layers.

M.m² Brown- to tan-weathering, fine-grained, thin-bedded mudstone to siltstone. 10s of cm- and 10s of m-scale, layers of quartz arenite, arenite and minor lime-bearing argillaceous rocks.

M.m³ White- to pink- red- grey- to grey-weathering, fine- to coarse-grained variably recrystallized quartz arenite and arenite. Prominent rock within the basal stratigraphic formation containing abundant cm- to 10s of m-scale interbedded layers of siltstone, mudstone, shale and minor calcareous rocks.

M.m⁴ White- pink- red- to grey-weathering, medium- to coarse-grained granule-, pebble- and cobble-bearing arenaceous conglomerates.

M.m⁵ White- to grey-weathering, fine- to medium-grained, strongly foliated and recrystallized quartz arenite schist, derived from quartz arenite and arenaceous conglomerate. Contains quartz-vein felsic schist and metagabbro.

M.m⁶ Green- grey- brown- to red-weathering, fine- to medium-grained gabbro- to gabbro-magnetite basalt. May contain intercalated layers of volcanic tuffaceous rocks, sedimentary rocks and gabbro (as thin silt).

M.m⁷ Green- grey- to brown-weathering, fine- to medium-grained, locally massive, locally schistose, ortho- to mafic igneous rocks. Locally exhibits a diffuse layering that may include volcanic breccia and intrusive breccia. May also include fine-grained, homogeneous basalt flows and sedimentary rocks.

M.m⁸ Green- grey- to brown-weathering, medium-grained, volcanic and intrusive breccia. Occurs as localized layers within thick sequences of basalt flows. Contains clasts and fragments of basalt, volcaniclastic rocks, gabbro and sedimentary rocks in basaltic and gabbroic matrices.

M.m⁹ Green- brown- to grey-weathering, fine- to medium-grained basalt flow containing local pillow structures.

M.m¹⁰ Green-weathering, fine-grained, very strongly deformed basalt, metamorphosed to mylonitic-oligoclase schist. Occurs as thin zones adjacent to north and northeast-sloping thrust fault.

M.m¹¹ Green- to grey-weathering, fine- to medium-grained, massive, amphibolized gabbro. Occurs as rare, less than 100 m thick silt intruding quartz arenite and arenite and basalt flows.

Harp Dykes (1271 ± 1 Ma)

M.d¹ Northeast-sloping, olivine diabase dykes intrude ortho- and mafic rocks of the Harp Lake Intrusive Suite.

Letitia Lake Group (ca. 1327 Ma)

M.l¹ Fine- to medium-grained siltstone to grey-weathering, strongly foliated and brecciated hornblende-bearing, mafic-rich schist or volcanic tuff, interpreted as an uppermost layer of Letitia Lake Group in unconformable contact with quartz-arenite schist at the base of the Seal Lake Group.

M.l² Well-bedded and complexly foliated felsic volcanic rocks, volcanic derived sedimentary rocks of the Letitia Lake Group may include quartz-hornblende schist, mafic volcanic rocks and other igneous rocks.

M.l³ White-, buff-, to grey-weathering, weakly foliated to gneissic, medium-grained, recrystallized mylonite porphyry to trondhjemite and gneissic rocks. Locally intercalated with undeformed felsic volcanic rocks.

Red Wine Complex (ca. 1337 Ma)

M.rw¹ Quartz-arenite series

M.rw² Medium-grained, moderate to strongly foliated metite to intermediate peraluminous granitoid intrusions. Includes granites, quartz syenites, alkali-feldspar granites and alkali-feldspar quartz syenite.

M.rw³ Quartz-undersaturated series

M.rw⁴ About syenite and metamorphic equivalents.

LEGEND

EARLY MESOPROTEROZOIC

Harp Lake Intrusive Suite (1450 Ma)

M.a Grey- to grey-white-weathering, medium- to coarse-grained, massive to layered, orthopyroxene- and amphibole-bearing anorthoclase, aciculate and melanocrystic. The predominant rock type is mylonitic. Contains quartz-vein schist and mafic schist. May be associated with zones of weakly to moderately deformed quartz monzonite to granite, locally gradational to gabbro.

M.g Light brown- to rust-weathering, medium- to coarse-grained, massive biotite-hornblende granite, locally gradational to quartz monzonite.

LATE PALEOPROTEROZOIC

LATE LABRADORIAN ROCKS (1650 - 1650 Ma, reworked during Grenvillian Orogeny)

North Pole Brook Intrusive Suite (Trans-Labrador batholith, ca. 1650 Ma)

P.m¹ White- to pink-weathering, fine- to medium-grained, recrystallized, weakly foliated to mylonitic, K-feldspar porphyritic, biotite-hornblende quartz monzonite to granite, locally gradational to gabbro.

P.m² Grey- to green-weathering, medium- to coarse-grained, massive to foliated hornblende-quartz monzonite to diorite.

P.m³ Unaugmented intrusions

Brace River Group (ca. 1650 Ma)

Silica Lake Formation

P.s¹ Rhyolite, andesite, trachyandesite and basalt. Occurs as massive to brecciated flows, agglomerate and locally bedded tuffaceous rocks.

Brown Lake Formation

P.b¹ Volcaniclastic sandstone, tuff, minor conglomerate and arkose

MIDDLE MESOPROTEROZOIC

Moran Lake Group (ca. 1800 Ma)

Warwick Creek Formation

F.w¹ Grey- to black-weathering mudstone, slate, siltstone and minor intrusions, dolomite and chert.

ARCHAEN-PALEOPROTEROZOIC

Southeastern Churchill Province (exposed during Grenvillian Orogeny)

Archean Intrusive Suite

A.i¹ Unfoliated to foliated granite and orthogneiss. May be correlative with rocks of the Seal Lake Intrusive Suite.

A.i² Fine- to medium-grained, weak to moderately foliated, biotite-hornblende quartz monzonite to quartz monzonite.

A.i³ Medium-grained, weakly to strongly foliated hornblende-quartz monzonite. May be correlative with rocks of the Seal Lake Intrusive Suite.

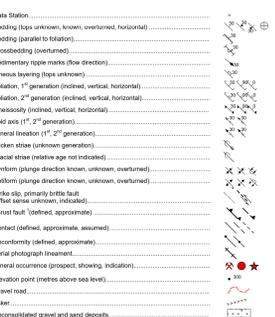
A.i⁴ Silt Lake Intrusive Suite, includes foliated to gneissic granite, quartz monzonite, gabbro, quartz diorite and diorite.

South Nain and Makkovik provinces

A.g¹ Granodiorite, tonalite orthogneiss and abundant mafic intrusions

Note: Legend is common to all maps (Map 2023-14 to Map 2023-33), but all units do not appear on every map.

SYMBOLS



* Thrust faults based on the presence of ductile features such as mylonitic bands, rotated phylloids and asymmetric pressure shadows and, in part, on aeromagnetic signatures. Direction of thrust teeth indicate the dip of thrust fault.

MINERAL OCCURRENCE

MINERAL	MAP LABEL	SYMBOL	EMPHASIS	REFERENCE	SOURCE REFERENCE
Cu	Copper	(Symbol)	500000	6031000	Geoffre 03L0018
Ag	Silver	(Symbol)	500000	6031000	Geoffre 03L0018
U	Uranium (radiometric)	(Symbol)	500000	6031000	Geoffre 03L0018
Pb	Pb	(Symbol)	500000	6031000	Geoffre 03L0018
Ni	Nickel	(Symbol)	500000	6031000	Geoffre 03L0018
Zn	Zinc	(Symbol)	500000	6031000	Geoffre 03L0018

Note: Symbols of mineral occurrences are referenced after Mineral Occurrence Database System (2002).