

DESCRIPTION OF MAP UNITS

BEAVER BAY COMPLEX—an igneous supracrustal unit which is part of the Midcontinent rift system. Includes all intrusive rocks occurring along the North Shore of Lake Superior between Split Rock Point and the Caribou River and traceable at least 30 km inland (after Grout and Schwartz, 1939).

SILVER BAY INTRUSIONS—an informal lithodemic unit consisting of strongly differentiated, zoned, saucer-shaped gabbroic intrusions. Generally divisible into a coarse, varietal marginal zone and an interior medium-grained, laminated and layered cumulate sequence. The bodies were emplaced and differentiated within the upper parts of Beaver River diabase sills. Contacts with Beaver River diabase are sharp but not chilled. Contacts among Silver Bay rocks are typically gradational.

IGNEOUS ROCKS

SILVER BAY INTRUSIONS

- lipm** Prismatic mafic quartz monzonite—pink, coarse-grained, intergranular to mottled granophyric quartz monzonite to quartz monzonitic with prismatic to acicular mafic minerals. Contains 55-70% hematite-dated, radiating sheaves or prisms of orthoclase and saussuritized subhedral albite; 5-15% granular to micrographic quartz; 5-10% long radiating prisms (<10 cm) of green ferrobastite; 4-8% skeletal prisms of hedenbergite (En74 Fs46 Wo44); 4-8% skeletal Fe-Ti oxide needles; and minor (<2%) apatite, sphene, and zircon. Alteration phases include chlorite, epidote, calcite, and hematite. The intense alteration of Lax Lake gabbro rocks adjacent to lipm rocks suggests that this unit may be younger than most Lax Lake gabbro rocks. Prismatic mafic micrographic quartz monzonite designated as lipm? in the vicinity of Nicado Creek (sec. 36) may prove to be correlative with granophyric units of the Silver Bay intrusions.

MISCELLANEOUS INTRUSIONS

- od** Ophiolite diabase—fine-grained, locally layered, ophiolite diabase with small (<0.5 cm) augite oikocrysts (En49 Fs16 Wo30) enclosing subhedral plagioclase. Intertrochite area is composed of plagioclase, anhydrous Fe oxide, typically altered olivine (F50-4), biotite, chlorite, and clay minerals. In weathered rocks, the intertrochite area commonly displays a distinctive brick red iron stain. Subtle centimeter-scale layering results from variations in ophiolite density. Unit occurs as a sill 50 to 65 m thick within the volcanic flow. Similar in texture and mineralogy to the finer grained varieties of brd rocks that intrude it, but is more evolved.
- ig** Intergranular diabase—aphanitic to medium-grained, massive, intergranular to locally interstitial, oxide-rich gabbro to gabbroite (chemically ferrobasalt). Contains 40-50% subhedral plagioclase (An55-60); 30-40% anhydrous granular (rarely prismatic or subophitic) augite (En41 Fs23 Wo43); 10-15% anhydrous granular Fe-Ti oxide and rare pyrite; 2-5% altered olivine; and minor interstitial biotite, orthoclase, quartz, calcite, apatite, hornblende, chlorite, and brown cryocrystalline mesostasis (altered glass). Occurs as a sill 15 to 20 m thick in volcanic rocks west of the Milepost 7 tailings basin and as small intrusive bodies in Lax Lake gabbro rocks. Unit termed ferrobasalt by Green (1982).
- tr** Troctolite—coarse-grained, ophiolite-olivine-plagioclase cumulate displaying subtle modal layering. Contains 60-75% subhedral plagioclase (An55-58); 20-35% subhedral granular olivine (F62-60); 2-7% ophiolite (<2 cm) augite (En46 Fs14 Wo42); 2-10% subophitic to subophitic spinel and ilmenite; and minor hypersthene, hornblende, and secondary biotite. Occurs as a gently dipping intrusion in the northwest corner of the Silver Bay quadrangle. May be cognate with troctolitic rocks of the Sonju Lake intrusion exposed in the Finland quadrangle to the northeast.

KEWENAWAN SUPERGROUP—stratified rocks that also are part of the Midcontinent rift system.

NORTH SHORE VOLCANIC GROUP—a thick (3-7 km) sequence of lava flows and minor interflow sedimentary rocks extending along the North Shore of Lake Superior from Duluth to Grand Portage. In this area, the rocks belong to the upper part, which has normal polarity. They include flows of the Gooseberry River basalts and Baptism River lavas (Green, 1972).

- nav** Undifferentiated volcanic rocks—generally low areas with little or no outcrop presumed to be mostly undrained by volcanic rocks and minor interflow sedimentary rocks. May also include miscellaneous intrusions such as od and igd.
- nsb** Basalt and basaltic andesite—volcanic sequence dominated by fine-grained, intergranular to interstitial and locally subvolcanic basalt and basaltic andesite. Sequence may include other volcanic rock types, but if so, they are uncommon. Typically strongly altered from original mineralogy that consisted of plagioclase, augite, iron oxide, and rare olivine. Some flows are plagioclase porphyritic (<5%). Some more mafic compositions display subtle banding of alternating black and reddish-brown layers reflecting varying oxide contents. Strongly amygdaloidal flow tops are typically brecciated and filled with siltsstone. Recrystallization textures and granophyric inclusions are common in the vicinity of intrusive rock.
- nsob** Ophiolite basalt—volcanic sequence dominated by fine- to medium-fine-grained, typically ophiolite but locally intergranular to subophitic, basaltic lava flows. Consists of augite oikocrysts as much as 5 mm across, labradorite plagioclase, altered granular and biotite, and minor interstitial biotite, orthoclase, quartz, calcite, and secondary biotite. Quartz-lined vesicles are common in the flow top. Occurs as a single poorly exposed flow north of Beaver Bay and, though more porphyritic, is probably correlative with the Silver Beaver felsite exposed in the Ilgen City quadrangle to the east.
- nspp** Porphyritic ophiolite basalt—similar to nsob except contains up to 50% large (2-5 cm) tabular plagioclase megacrysts (An50-60). The single thick (15-20 m) lava flow traceable throughout the area is informally named the Silver Bay porphyritic basalt.
- nsr** Aphyric rhyolite—pink to light-gray, aphanitic to fine-grained, intergranular, spherulitic, aphyric to mildly feldspar-porphyrific rhyolite, which is commonly banded with light-colored layers. Quartz-lined vesicles are common in the flow top. Occurs as a single poorly exposed flow north of Beaver Bay and, though more porphyritic, is probably correlative with the Silver Beaver felsite exposed in the Ilgen City quadrangle to the east.
- nspr** Porphyritic rhyolite—salmon-pink to pinkish-gray, aphanitic to fine-grained, intergranular to quartz-poikilitic rhyolite with phenocrysts of quartz, alkali feldspar, and rare prismatic Fe-rich mafic minerals. Occurs as a single flow which is only partially exposed on Pellet and Wieland Islands in Lake Superior. It is probably correlative with the Palisade Head rhyolite flow exposed in the Ilgen City quadrangle to the east.
- nss** Interflow sedimentary rock—red-brown, buff, and tan, calcareous and feldspathic, interbedded siltsstone, sandstone, and conglomerate. Finer grained rocks are commonly laminated and locally cross-bedded. Generally poorly exposed, although three typically hornfelsed units as much as 3 m thick are noted.

INCLUSIONS IN BEAVER RIVER DIABASE—age uncertain.

- an** Anorthositic—coarse-grained, locally textured, plagioclase cumulate. Largely 85-95% tabular calcic plagioclase (An54-60), together with various amounts of granular hypersthene, granular to poikilitic olivine, subophitic to ophiolite augite, and anhydrous granular Fe-Ti oxide. Isotopic and trace element evidence for the age of these inclusions is ambiguous but suggests that they may be pre-rift (Morrison and others, 1983).
- gr** Granite—pink, medium-grained, equigranular composite of 35-50% subhedral to micrographic, commonly perthitic, alkali feldspar; 15-25% anhydrous granular to micrographic quartz; 10-20% subhedral plagioclase; and 5-15% Fe-rich, typically altered, subpoikilitic to anhydrous pyroxene and rare olivine.
- gp** Granophyre—pink, medium-grained, micrographic granite. Mineralogically similar to granite inclusions, but displays extensive micrographic texture and contains prismatic, Fe-rich pyroxene and olivine.

REFERENCES

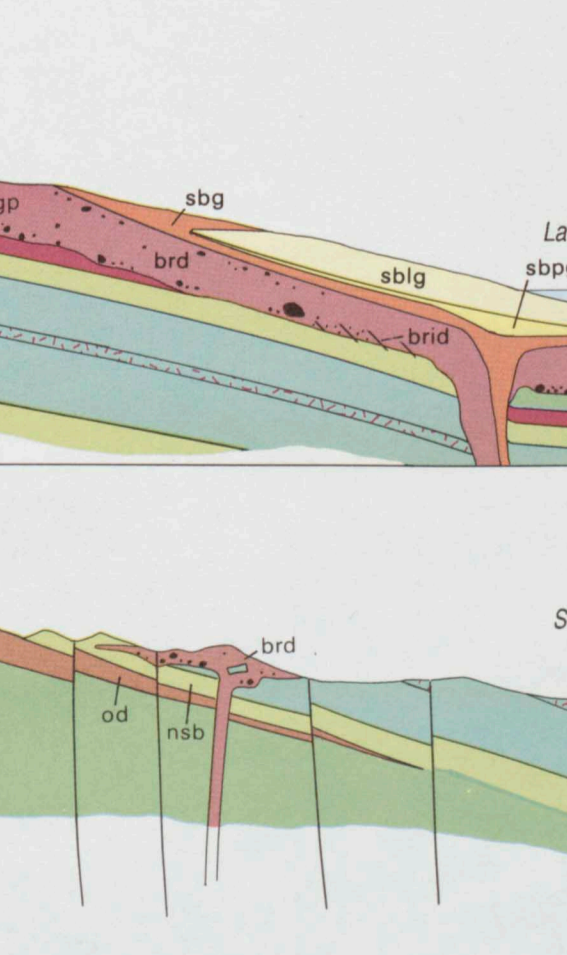
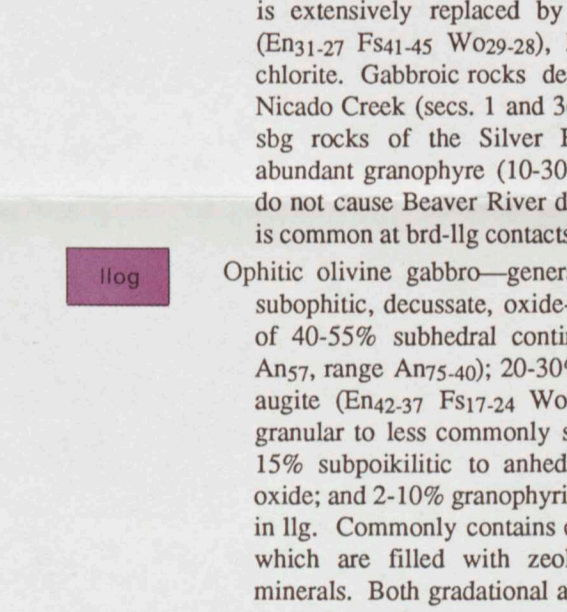
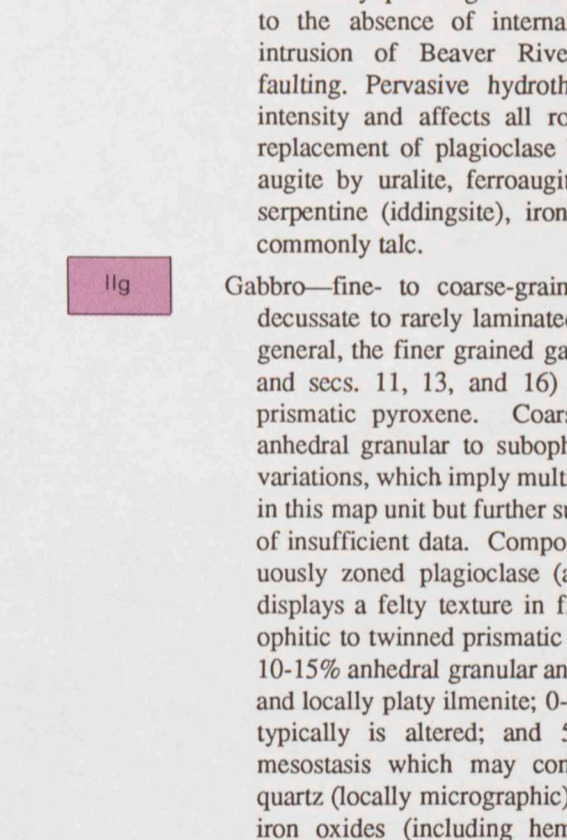
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GEOLOGIC MAP OF THE SILVER BAY AND SPLIT ROCK POINT NE QUADRANGLES, LAKE COUNTY, MINNESOTA

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