

DESCRIPTIVE NOTES

The land areas appear flat or plateau-like when viewed from the tops of the higher hills, but in detail are rugged, with a maximum local relief of more than 800 feet. The shoreline is irregular, with deep, fiord-like bays, and with cliffs rising several hundred feet above the level of Great Bear Lake. Throughout most of the area the bedrock has been swept clean of overburden by the last ice-sheet, which advanced from the east. Post-glacial, raised beaches are well developed in the northern part of the area; the highest, west of Norrie Bay, is about 450 feet above present lake level. Good timber is scarce, but scattered stands of spruce grow on sheltered slopes throughout the area.

The oldest rocks are a complex of volcanic flows and interbedded sedimentary rocks (1, 2) that have been tentatively assigned to the Cameron Bay group of lithologically similar rocks of the Cameron Bay-Echo Bay area some 12 miles to the south, though in general the flows of the MacAlpine Channel area are more siliceous. The lavas are largely maroon to pinkish dacites, with marked trachytic structure, but in places, particularly in the northern part of the area, maroon to purplish andesites are common. The sedimentary rocks on Achook Island, Rocher Rouge Island, Cornwall Island, the north part of Stevens Island, and parts of Doghead Peninsula are conglomerate. Elsewhere they are largely gritty quartzite, impure quartzite, and argillite. The conglomerate is a ferruginous, poorly bedded rock composed of fairly well-rounded pebbles and cobbles of altered porphyry, quartzite, chloritic argillite, and some vein quartz and granite. Most of it is loosely consolidated, rusty weathering, and similar in appearance to the conglomerate of Cameron Bay. In general, the strata of the group dip at angles of 45 degrees or less, but in places, particularly near faults and the larger granitic intrusions, the beds are more steeply inclined.

The oldest of the intrusive rocks is the irregularly shaped body of quartz andesite porphyry (3) that extends north from the southernmost tip of the peninsula 1 mile east of Stevens Island across MacAlpine Channel, along the east side of Cornwall Island and the northwest side of Boadway Island. This porphyry is composed of phenocrysts of euhedral, whitish weathering feldspar and quartz, and of a matrix of minor hornblende and biotite in a maroon to grey, felsitic groundmass. Many of the larger crystals, which are up to 1/2 inch long, are corroded, and some of the feldspar phenocrysts are zoned.

The largest body of granite (4) in the area forms most of Hogarth and Workman Islands and parts of Achook and Stevens Islands and the southern part of Domex Bay. The east boundary of the map-area are probably apophyses of a granite batholith farther east. Most of the granite is a light pink granite of medium grain, but much of the Hogarth Island granite is fine grained, and the granite of the west side of Cornwall Island is relatively coarse grained. The composition of the rock ranges from that of normal granite to granodiorite. No pegmatites are associated with the granitic intrusions, but a few light pink apite dykes occur near contacts both in the granite and in the intruded rocks. A small body of porphyritic granite (4a) occurs within rhyolite porphyry about 1/2 mile southwest of Hook Lake. It is composed of prominent, whitish weathering feldspar crystals up to 1/2 inch long in a fine- to medium-grained, rusty to purplish pink groundmass much resembling that of the adjacent rhyolite porphyry (5a). The porphyritic granite has indistinct boundaries with, and appears to grade into, the rhyolite porphyry, and is probably a local coarse facies of it.

A large body of rhyolite porphyry (5b) extends south from Boadway Island across the map-area, attaining its greatest width on the mainland south of Domex Bay. The few dip observations suggest that this porphyry is, in the main, an easterly dipping tabular body of limited thickness. Smaller porphyry bodies occur on Achook Island, Rocher Rouge Island, and Cornwall Island, and on the mainland at Norrie Bay. The rhyolite porphyries (5a-5c) are commonly light to deep salmon-pink rocks, but in places, as on Achook Island, Rocher Rouge Island, and Cornwall Island, they are purple. Their general reddish colour is caused by a coating of iron oxide on the mineral grains of the rock, but near quartz veins and shear zones the porphyry may be coloured a light chloritic green. Phenocrysts of both orthoclase and plagioclase feldspar are prominent in all the porphyries, whereas phenocrysts of quartz and hornblende or biotite vary in amount from place to place. The grain size of the rock ranges from that of a fine-grained rhyolite porphyry to a granite porphyry. In the main body south of Domex Bay, specimens of fairly coarse, greyish pink granite porphyry and reddish pink rhyolite porphyry can be obtained within a few feet of each other, but no intrusive contacts were found between the two facies. Some contacts between granite (4) and porphyry (5) appear to be gradational, but in other places the porphyry definitely cuts the granite. Thus, between two small lakes about 1 1/2 miles southeast of the end of Domex Bay, a pink rhyolite porphyry dyke extends some 200 yards into granite from the main porphyry body. Again, on the first small island northeast of Boadway Island, a small granite body within porphyry is cut by porphyry dykes. The porphyry is probably somewhat younger than the granite, but the two are believed to be closely related and derived from a common magma.

The Hornby Bay group (6, 7) of this area comprises two members, neither of which is completely exposed; nor has the top or bottom of the group been observed. The lower member (6) is a rusty red, fine- to medium-grained, thin-bedded quartzitic sandstone crossbedding and ripple-marked. Locally, the red sandstone is mottled with white patches up to 1 inch in diameter that are conspicuous on both freshly broken and weathered surfaces. Overlying the red sandstone is a white to light pink, coarse, quartzitic sandstone (7) containing interbeds of pebble conglomerate. The sand grains and pebbles are well rounded, and more than 90 per cent of them are quartz. The remainder of the rock is composed of reddish cherty material. The beds are much thicker and less well defined than those in the lower sandstone (6). The Hornby Bay group is gently warped, with dips averaging not more than 5 to 10 degrees. Contacts with the Cameron Bay (7) group (1, 2) are not exposed, but the different attitudes of the two groups indicate an angular unconformity between them. The Hornby Bay rocks were probably deposited on an old erosion surface that truncated folded Cameron Bay (7) strata (1, 2) and granite (4) and porphyry intrusions (5).

The sills and dykes of diabase (8) are of at least two ages. The older diabase is a brownish grey, rusty weathering rock. It is cut by a much more common, greenish grey, dark grey weathering diabase similar to the late quartz diabase dykes of the Eldorado Mine area 12 miles to the south. The younger diabase occurs mainly as gently dipping sheets in the igneous rocks and as sills in the sedimentary formations. It also occurs as irregular dykes, some of which are apophyses of larger, sheet-like masses. The greenish grey diabase is the youngest rock in the area; it cuts not only Hornby Bay strata (6, 7) but also some of the giant quartz veins.

The main faults of the area strike northeast, and along most of them the north-west side has moved relatively northeast. The fault zones are characterized by the development of fault breccia rather than schist, and some contain quartz veins and stock-works. They appear to dip at steep to vertical angles. MacAlpine Channel and possibly other northeast trending channels are developed along such faults. A second set of faults, with less displacement, trends nearly north; along these the west side has moved relatively north.

Several giant quartz veins or stock-works up to 300 feet wide have formed along northeasterly trending fault zones. At least three generations of quartz were observed in these veins. In several places the veins or stock-works are cut by small basic dykes, but on the north shore of Boadway Island a quartz vein cuts and alters what appears to be a late diabase dyke. Quartz veins, similar to the giant quartz veins, cut the Hornby Bay group north of Elizabeth Lake.

The only known minerals of economic interest are those of uranium and copper. All occurrences so far found lie along or near northeasterly trending faults and giant quartz veins. At the head of Hunter Bay, near the mouth of Sloan River, some pitchblende and uranium stain occur in a narrow quartz vein in granite within 20 feet of a giant quartz vein. Another radioactive occurrence, also associated with a giant quartz vein, has been found on the east side of Workman Island. Five small occurrences of uranium minerals lie near the most southeasterly of the northeasterly trending faults on Achook Island. They occur in narrow quartz veins in porphyritic dacite, and contain hematite, carbonate, chalcopryite, and a little uranium stain. Some trenching has been done on a copper occurrence in a giant quartz vein, known as the Sloan dyke, on the north shore of Hunter Bay about 1,300 yards west of the east boundary of the area. The quartz vein is about 100 feet wide and is bounded by granite on the northwest and porphyritic dacite on the southeast. Bornite, chalcopryite, pyrite, hematite, and carbonate are deposited along fractures in vein breccia for a length of nearly 150 feet.

LEGEND

- 8** Mainly coarse-grained, greenish grey, quartz diabase
- 7** HORNBY BAY GROUP (6, 7)
White to light pink, coarse-grained, crossbedded, quartzite and siliceous sandstone; some fine conglomerate
- 6** Siliceous, rusty red, medium- to fine-grained, ripple-marked, crossbedded sandstone
- 5a-5c** 5a, pink to greyish pink rhyolite porphyry and minor granite porphyry; 5b, pink, coarsely porphyritic rhyolite porphyry; 5c, pink, finely porphyritic rhyolite porphyry; felsite
- 4** Light pink, coarse- to fine-grained granite and minor granodiorite; 4a, fine- to medium-grained granite (probably a facies of 5a)
- 3** Maroon to grey, coarsely porphyritic, quartz andesite porphyry
- CAMERON BAY GROUP (1)**
1, Fine to coarse arkosic conglomerate; argillite, impure quartzite, tuff; some agglomerate and thin lava flows
2, Dacite and andesite, locally trachytic in texture; some thin intercalated sedimentary beds

- Quartz vein
- Bedding (inclined, dip unknown)
- Bedding (direction of dip known, upper side of bed unknown)
- Schistosity (inclined, vertical, dip unknown)
- Fault (defined, approximate)
- Glacial striae
- Test pit, trench

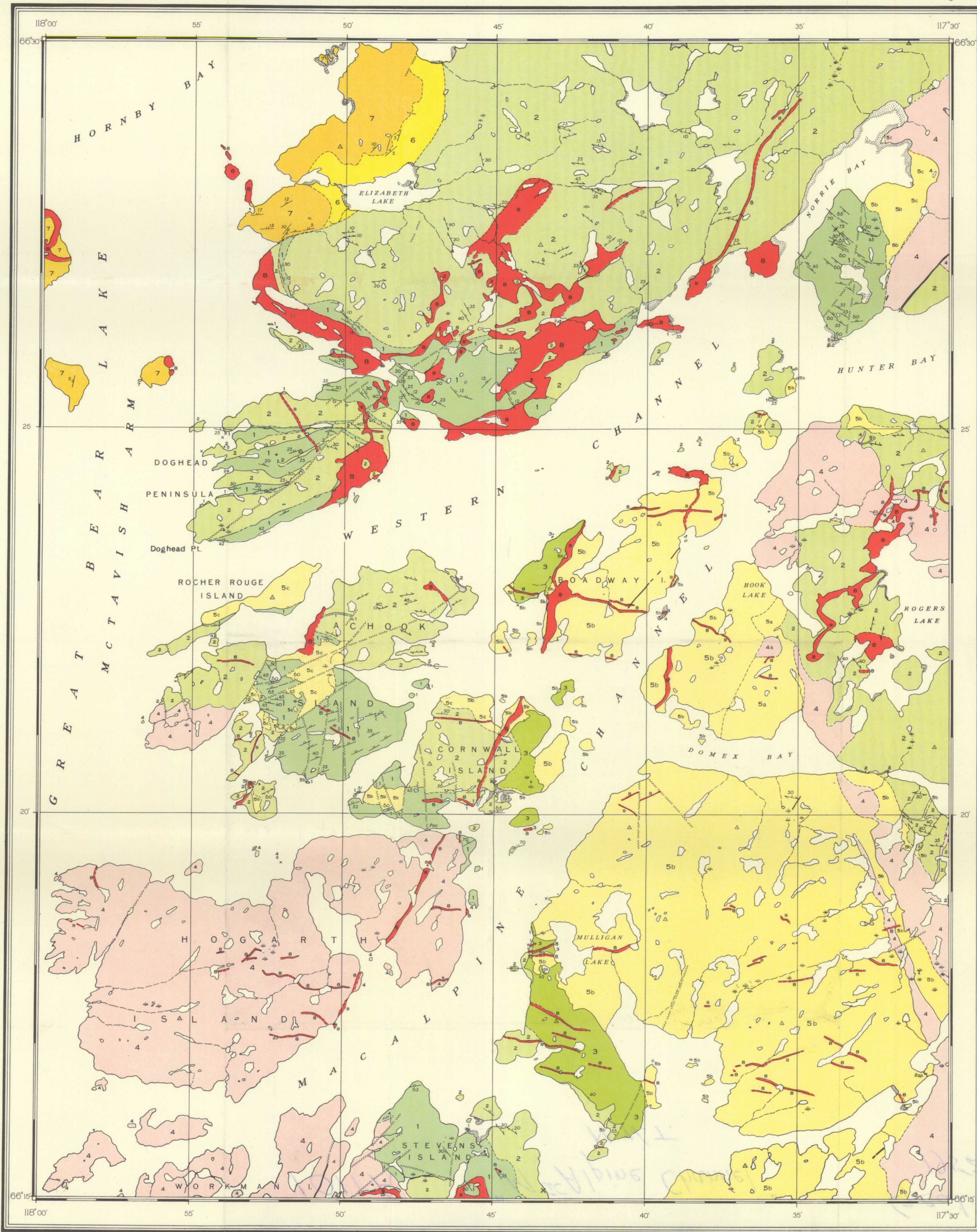
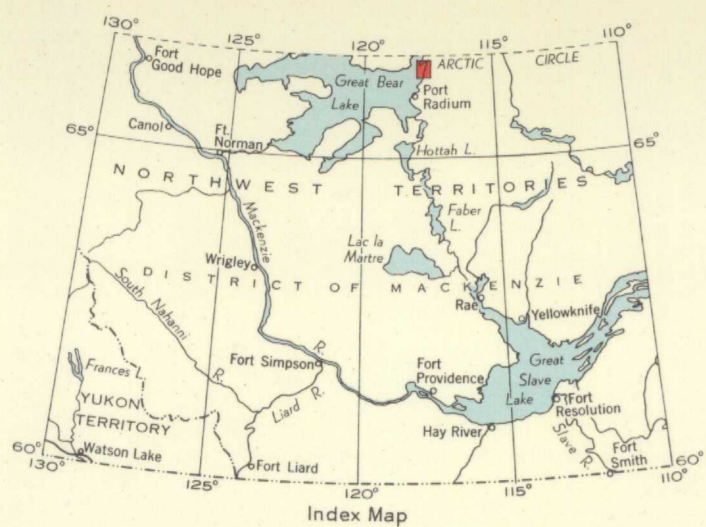
Geology by M. Feniak, 1948

Cartography by the Geological Mapping Division, 1951

- Portage
- Triangulation station
- Intermittent stream
- Rapid
- Marsh or swamp
- Reef or small island
- Sand

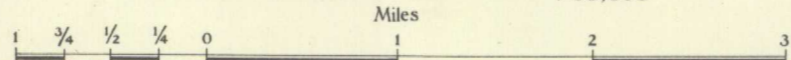
Base map surveyed by the Topographical Survey, in 1947.
Compiled by the Topographical Survey, in 1948, from air photographs taken in 1946 by the Royal Canadian Air Force

Approximate magnetic declination, 43°00' East



MAP 1011A
MACALPINE CHANNEL
DISTRICT OF MACKENZIE
NORTHWEST TERRITORIES

Scale: One Inch to One Mile = 1/63,360



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