



DESCRIPTIVE NOTES

Relief is greatest in terrain underlain by feldspar porphyry (2) where steep hills rise 600 feet above adjacent lakes. Prominent hills and ridges are also formed by quartz veins and stockworks and, in the southwest, by isolated cliffs of flat-lying strata. Glaciers have moved westward over the region, scouring and striating bedrock surfaces, and depositing boulders, till, and eskers. Very little of the bedrock in the southwest is exposed; elsewhere outcrop is abundant. Layers of clay in the drift, locally attaining a thickness of 20 feet, and raised beaches, at elevations up to 360 feet above Hardisty Lake, are evidence of widespread flooding following glaciation. Drift-covered areas are well wooded with spruce, jack pine, birch and tamarack.

The oldest rocks are small, ill-defined bodies of mica-quartz schist (1a) and chlorite schist (1b). The former are pale grey to green, fine-grained rocks of sedimentary origin resembling impure quartzite in part. The latter are medium-grained to fine-grained metamorphic derivatives of basic intrusive or extrusive rocks. Both commonly contain an admixture of granitic material.

Feldspar porphyry and quartz-feldspar porphyry (2), ranging from dacite to quartz latite, are pink and fine-grained or dark grey to black and aphanitic. Pale grey or green euhedral phenocrysts of oligoclase or andesine 1/16 to 1/8 inch long, and, in some cases 1/4 inch long, make up 25 per cent of the rock. Potassic feldspar may be present as rare phenocrysts up to 1/8 inch long. Quartz phenocrysts are smaller and less abundant than those of feldspar. Feldspar porphyry with fragmental and pillow structures indicative of volcanic origin are found north of Isabella Lake. Small bodies of grey feldspar porphyry near Malfait Lake are locally intruded by quartz monzonite (Aa) but in their contact zone both rocks are cut by dykes of red quartz-feldspar porphyry. At the north end of Margaret Lake sharp irregular contacts separate pink feldspar porphyry (2) from younger porphyritic granite (3).

Rocks mapped as granite (A) comprise granite, quartz monzonite, and minor granodiorite and quartz diorite. Almost all of these are massive and some are porphyritic. Much of the granite is fine grained to medium grained with 30 per cent quartz, 50 per cent microcline and microperthite, 20 per cent oligoclase, and a few per cent biotite or chlorite. Granitic rocks in the vicinity of Malfait Lake are predominantly hornblende granite or quartz monzonite (Aa). Inclusions of feldspar porphyry are locally abundant in quartz monzonite within a few hundred feet of contacts with feldspar porphyry (2). Northwest of Margaret Lake and east of Hardisty Lake quartz monzonite (Aa) grades into massive, coarse-grained, pink granite (Ab). This rock is similar in composition and appearance to porphyritic granite (3) but, in the latter, insets of pink feldspar are larger and more numerous. The coarse-grained granite (Ab) grades into porphyritic granite (3) and is possibly a marginal phase of it.

Pink, or, more rarely, grey microcline and microperthite in euhedral phenocrysts up to 2 inches long constitute 50 to 80 per cent of the porphyritic granite (3). The matrix consists of quartz, oligoclase, and biotite. Marginal parts of a porphyritic granite body commonly show a decrease in insets to less than 20 per cent and an increase in plagioclase content. That the porphyritic granite (3) is in part at least younger than granite (A) is evidenced by the occurrence in the former of rare xenoliths of medium-grained, and fine-grained granite and, at Rae Lake, by an intrusive contact between porphyritic granite and granite.

Numerous irregular masses and dykes of fine-grained, pink aplite, ranging in width from a few inches to more than 30 feet, intrude granite (A), feldspar porphyry (2), and porphyritic granite (3). Contacts with wall-rocks are sharp or gradational and trend in all directions.

Dykes of brown-weathering diabase or gabbro (4) are the youngest of the igneous rocks. Dyke widths range from a few inches to more than 500 feet. Those shown represent dyke swarms or dykes more than 50 feet wide. Most of the dykes have steep to vertical dips but the large dyke in the south half of the map-area dips south about 35 degrees. Except for traces of pyrite and chalcopyrite the dykes are free of sulphide minerals.

Quartz veins cut all the non-sedimentary rock types including aplite and diabase (4). Those mapped are between 50 and 100 feet wide. They have a general southwest trend and are steeply inclined. The central part of a vein is typically of massive white or pinkish quartz; at the margins partial replacement of the walls by silica has produced quartz stockworks and vein breccia. Many veinlets between 1/2 and 1 inch wide have well developed comb structure in vertical dip but the large dyke in the south half of the map-area dips south about 35 degrees. Except for traces of pyrite and chalcopyrite the dykes are free of sulphide minerals.

The youngest rocks (5) are flat-lying or gently dipping strata of sandstone, dolomite, and shale, exposed in a series of east-facing scarps representing a total thickness of approximately 400 feet. Thickness estimates are based largely on elevational differences between outcrops since bedrock is poorly exposed. At Rae Lake impure arkosic sandstone rests unconformably on granite. To the west it is overlain by red sandstone grading upwards into white, or light grey, fine-grained sandstone consisting chiefly of well-sized and rounded quartz grains. Total thickness of the sandstone is probably not more than 100 feet. Stratigraphically above the sandstone is dark grey, thin-bedded dolomite which weathers brown or reddish brown. Light grey dolomite near the top of the section carries 15 per cent quartz and feldspar and contains casts of salt crystals. Locally the dolomite is interbedded with 20 feet of light green or grey, thin-bedded, fissile shale. Fossils were not found in the dolomite but from a comparison with similar strata described by Lord¹ in an adjoining map-area it is assumed to be Palaeozoic. The sandstone may be of Palaeozoic or Proterozoic age. Contacts between the sandstone and the dolomite were not observed.

Pitchblende is exposed in pits and trenches on the U. R. group of claims west of Hardisty Lake². The showings follow the strike of a quartz stockwork which intrudes feldspar porphyry (2) and has a strike length of more than 1,500 feet. Steeply dipping fractures in the quartz vein are filled with hematite and, in a few places, with films of pitchblende. Elsewhere shear zones in feldspar porphyry that contain fine, disseminated pyrite may merit further investigation. One such zone north of Malfait Lake can be traced by discontinuous outcrop for more than 2,000 feet.

¹Lord, C. S.: Snare River and Ingray Lake Map-Areas, Northwest Territories; Geol. Surv., Canada, Mem. 235, p. 37, 1942.

²Lang, A. H.: Canadian Deposits of Uranium and Thorium; Geol. Surv., Canada, Economic Geology Series No. 16, p. 59, 1952

- LEGEND
- PALAEZOIC OR AND/OR PROTEROZOIC
- 5 Dolomite (D), sandstone (S), shale (Sh); minor arkose
- ARCHAEOAN OR PROTEROZOIC
- 4 Diabase, gabbro
 - 3 Porphyritic granite
 - 2 Feldspar porphyry, quartz-feldspar porphyry
 - 1 Metamorphic rocks of igneous or sedimentary origin, commonly with some granitic material; 1a, mica-quartz schist; 1b, chlorite schist, meta-diorite. In part may be younger than 2
- PRECAMBRIAN
- A Granite and allied rocks of various ages; Aa, quartz monzonite, hornblende granite; minor granodiorite, quartz diorite; Ab, coarse-grained granite, porphyritic in part

- Geological boundary (defined, assumed)
- Bedding (horizontal)
- Schistosity, gneissosity (inclined)
- Fault, shear zone (defined, assumed)
- Glacial striae
- Esker
- Quartz vein or stockwork
- Mineral occurrence (Pyrite, py; Uranium, U) xpy

Geology by J. A. Fraser, 1956

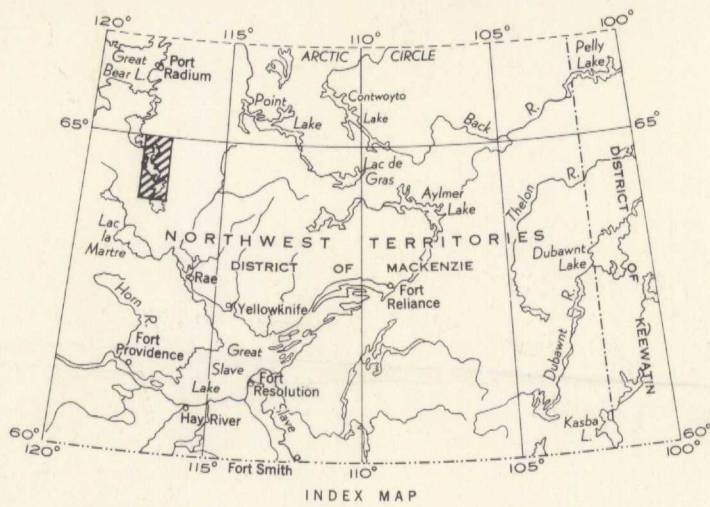
- Portage
- Cabin
- Lake and stream (position approximate)
- Falls and rapids
- Marsh
- Sand and gravel
- Height in feet above mean sea-level 748

Approximate magnetic declination, 37° 33' East

Cartography by the Geological Cartography Unit, 1958

Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

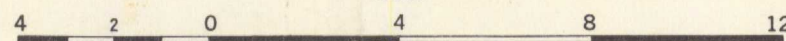
In response to public demand for earlier publication, Preliminary Series maps are now being issued in this simplified form, thereby effecting a substantial saving in time. There is no loss of information, but the maps will be clearer to read if all or some of the map-units are hand-coloured.



PROPERTY OF LIBRARY
GEOLOGICAL SURVEY OF CANADA
Victoria Memorial Museum Bldg., Ottawa
LENT TO *W. J. Falgout*
DATE *Nov 27 1958* PLEASE RETURN

MAP 2 - 1958
HARDISTY LAKE
(WEST HALF)
DISTRICT OF MACKENZIE
NORTHWEST TERRITORIES

Scale: One Inch to Four Miles = $\frac{1}{253,440}$
Miles



*S.1.6 Hardisty Lake (W/2) N.W.T.
A. Geol.
Map 2-1958*