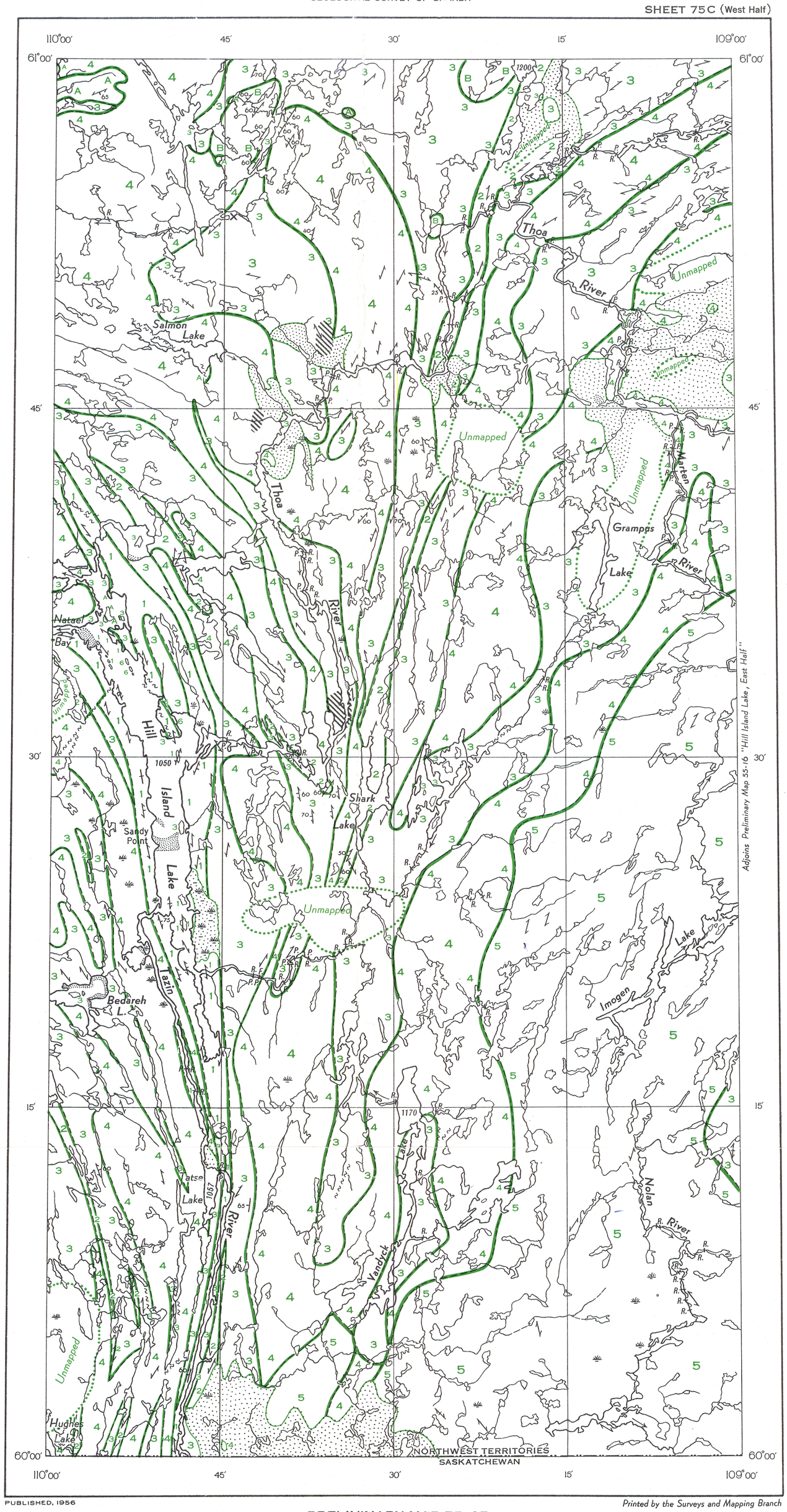
CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

SHEET 75C (West Half)



LEGEND

PRECAMBRIAN

6	*Diabase dykes*
5	*Granite and granitic gneiss, minor mafic rocks*
4	*Granitic gneiss; granite and allied rocks; pegmatite; with up to 30 per cent amphibolite, schist, quartzite*
3	*Banded and mixed gneisses; amphibolite, schist, quartzite; mafic granitoid rocks; silicified or cherty rocks with 30 to 70 per cent granitic and pegmatitic rocks*
2	**TAZIN? GROUP** *Quartzite; quartz-chlorite-biotite-hornblende, schist and gneiss; amphibolite; minor garnet gneiss with up to 30 per cent granitic and pegmatitic rocks*
1	**TAZIN GROUP** *Quartzite, argillaceous quartzite, quartz-chlorite and quartz-biotite schist*

A	*Conglomerate, minor grit (Nonacho Group)*
B	*Quartzite, minor conglomerate and grit*

Drift-covered areas (few or no exposures)
Area containing numerous diabase dykes
Geological boundary (approximate)
Bedding (inclined, vertical)
Schistosity, gneissosity (inclined, vertical, dip unknown)
Fault (assumed)
Radioactive mineral occurrence

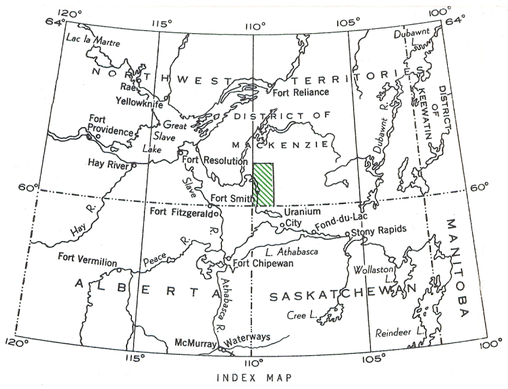
Geology by R. Mulligan, 1954

Portage P.
Provincial boundary
Fall and rapid F. R.
Marsh
Sand or gravel
Height in feet above mean sea-level 1050

Approximate magnetic declination, 28° 24′ East

Cartography by the Geological Cartography Unit, 1956

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



INDEX MAP

DESCRIPTIVE NOTES

Canoe routes to the area, from Camsell Portage on Lake Athabasca, via Tazin-Tsalwor Lakes and Tazin River, require much portaging[1]. The nearest commercial seaplane bases are at Uranium City, Saskatchewan, and Fort Smith, Northwest Territories. Tazin, Thoa, and Marten Rivers are navigable by canoe between mapped portages. Passable but poor water routes connect Vandyck and Grampus Lakes with Hill Island Lake, and extend from Imogen Lake north to Marten River and along Nolan River. Rocky hills and ridges, rising as much as 300 feet above intervening lakes and swampy creek valleys, occupy most of the area. However, sand plains and ridges and other drift deposits are fairly common, especially in the northeastern part. The drainage is disorganized, and most streams are graded only for short distances. Forest growth is sufficient for fuel and small timber. Peat forms banks about 8 feet high at several points on the west shore of Hill Island Lake.

Quartzites of the Tazin group (1) are characteristically fine grained and dark grey in colour, varying to bluish or purplish grey, or to black in argillaceous or schistose beds. They are well bedded and commonly finely banded. The schists are generally in thick massive bands, black or dark green in colour. These rocks are cut by quartz veins and in places contain many feldspar crystals and augen, and are intruded by dykes and irregular masses of granite and pegmatite.

A few lenticular bands of metamorphic rocks (2) scattered throughout the areas of mixed and granitic gneisses are of sufficient size to map separately. They resemble the Tazin group (1) rocks for the most part but generally carry more abundant feldspar.

A mixed assemblage of granitic and metamorphic rocks (3, 4) underlies much of the map-area. The units are gradational into one another, and the boundaries are arbitrarily drawn in most places. The quartzites of unit 3 are generally reddish in colour and they and the schists almost everywhere carry feldspar crystals and augen-like masses. Many of the mafic gneisses and granitoid rocks contain abundant magnetite. The rocks mapped as unit 3 on the east shore and nearby islands of Hill Island Lake are mainly grey to pink, hard, cherty rocks, with some intermixed, softer, dark green or black material. They have a somewhat crushed appearance in places. Such rocks are prominent around the borders of the conglomerate mass (A) on Hill Island Lake, where they are transitional into both conglomerate and granitic rocks. They are also transitional into Tazin-type rocks in that area.

The typical rocks of unit 4 are composed of feldspar, quartz, biotite, chlorite, and amphibole, in various proportions. Colours vary from white or grey through shades of pink to deep red. Most of the rocks are gneissic with regular foliation or irregular augen structures, but in many places gneissosity is not marked, and textures range from that of felsite through granite to pegmatite. The change from gneissic to granitic textures is imperceptible in most places, but in some the granitic facies show cross-cutting relationship to the gneisses. In composition, the rocks probably correspond mainly with granite, but granodiorite, syenite, and diorite may be represented. Biotite is the commonest mafic mineral, but chlorite or amphibole predominate in many places. Granitic rocks, composed of pink feldspar and greenish chlorite and amphibole with or without quartz, are particularly common around the upper part of Thoa River. Pegmatite, characterized by crystals of muscovite up to 2 inches across, is most common along Tazin River and west of Hill Island Lake.

The typical granite of unit 5 is grey or pink in colour and medium to coarse grained or porphyritic. The rocks mapped as unit 5 are more homogeneous than, but not otherwise distinguishable from, granitic facies of unit 4, and the boundary between the map-units is arbitrary.

Relationship of granite to conglomerate (A) and similar rocks in adjacent map-areas (See below), suggests that granite of more than one age may be present.

Diabase dykes (6) are conspicuous only in a few places along and near Thoa River and Hill Island Lake. Most dykes are too small to map individually, but they occur in swarms scattered over considerable areas. The diabase in some dykes is black; in others it is dark green. It is fine grained near contacts with granitic rocks but assumes a coarser texture a few feet away from contacts, and is there difficult to distinguish from some mafic gneisses. Diabase of more than one age may be present. Near the outlet of Hill Island Lake, a diabase dyke that cuts granite is penetrated by stringers of quartz emanating from a nearby stock-work.

Conglomerate (A) is of indefinite age relative to the granitic rocks and diabase. In the northwest corner it is continuous with conglomerate mapped as 'Nonacho Series' in the adjoining Fort Smith map-area[2], and that on Hill Island Lake is lithologically similar. The typical conglomerate is composed of fairly well-rounded fragments of pebble to boulder size, chiefly of granite and granitic gneiss with lesser amounts of quartz, quartzite, schist, and greenish aphanitic rocks, in an indistinct greenish matrix. Such conglomerate, in the interior of mapped bodies, appears to be only slightly deformed, and shows no sign of intrusion by granite. Near exposed contacts, however, fragment boundaries are irregular in shape and ill defined, and no recognizable sharp boundary between conglomerate and bordering granite and gneiss was observed. On Hill Island Lake the transition is marked in large part by a cherty silicification (?) zone (See under unit 3 above). On the whole it appears that the bordering granite intrudes rather than underlies the conglomerate, but this granite is lithologically indistinguishable from that composing the granitic pebbles. Near the southern margin of the northern body, the conglomerate passes into a zone in which only deformed granitic fragments are recognizable in a greenish, rather schistose interstitial mass. Thus the contact relationships are indefinite, and may be complicated by faulting. In the adjoining Fort Smith[2] and Nonacho[3] map-areas, similar conglomerate is intruded in some places by granite indistinguishable from that which underlies it in others. In Fort Smith area, granite that is considered to underlie conglomerate intrudes Tazin group rocks; hence the conglomerate is younger than the Tazin group.

Quartzite (B) is also, in part at least, probably younger than the Tazin group. The western body is white sericitic quartzite, with minor gritty and conglomeratic facies. The small body on Thoa River is white, sugary, rather coarse grained, with conspicuous cream-coloured cement. The quartzite of the easternmost body is mainly dark and fine grained, and may be equivalent in age to the nearby Tazin-type band (2). The gneisses of the large area that lies between these bodies may be derived in part from similar quartzites.

All the bedded rocks of the area have been disturbed, and the beds dip for the most part at moderate to high angles. Numerous topographic lineaments apparent in aerial photographs suggest faults. Few of these show positive evidence of faulting in the field, but they commonly mark swamp-floored valleys in which such evidence might be concealed. Recognition of faults by lithological differences on opposite sides of valleys is generally impossible because of the over-all heterogeneity of the rocks. Some assumed faults indicated on the map are marked in places by quartz veins or stock-works.

No mineral deposits of apparent importance were noted. In a few places, rocks of the Tazin type contain pockets of pyrite. Graphite is disseminated through sheared granitic rock in a zone near latitude 60°15′, longitude 110°00′. A sample of yellow secondary mineral, from a trench about 50 feet long near latitude 60°53′, longitude 109°44′30″, contains a little pitchblende. The locality is close to that reported for a radioactive occurrence known as the Key group.

1 Camsell, C.: An Exploration of the Tazin and Taltson Rivers, North West Territories; Geol. Surv., Canada, Mem. 84, p. 28 (1916).

2 Fort Smith, District of Mackenzie; Geol. Surv., Canada, Map 607A.

3 Nonacho Lake, District of Mackenzie; Geol. Surv., Canada, Map 526A.

PUBLISHED, 1956

Printed by the Surveys and Mapping Branch

PRELIMINARY MAP 55-25

HILL ISLAND LAKE
(WEST HALF)
DISTRICT OF MACKENZIE
NORTHWEST TERRITORIES

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

Miles
4 2 0 4 8 12

PRELIMINARY MAP 55-25
HILL ISLAND LAKE
NORTHWEST TERRITORIES
SHEET 75C (West Half)