CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

SHEET 74 $\frac{N}{11}$ (West Half)

LEGEND

LATE PRECAMBRIAN (PROTEROZOIC)

ATHABASCA SERIES (4–7)

7 — *UPPER PART* Arkose and sandstone; 7a, reddish brown and buff conglomerate

6 — *LOWER PART* Grey and greenish black greywacke

5 — Red and pink arkose

4 — Red and green conglomerate

8 — Diabase dykes and sills (age relative to 7 uncertain)

EARLY OR LATE PRECAMBRIAN (ARCHÆAN OR PROTEROZOIC)

3 — Reddish, generally banded, quartz feldspar gneiss with local amphibole-rich layers and minor red granite and pegmatite. Probably derived chiefly from 1 and 2. Granite and pegmatite post-Tazin group but all apparently pre-Athabasca

2 — WHITE LAKE COMPLEX: grey and white rocks ranging in composition from quartzite to granite and commonly containing large porphyroblasts of feldspar and garnet. Probably derived chiefly from 1

TAZIN GROUP

1 — Dominantly grey, green, and white quartzite with interbanded impure quartzitic and amphibolitic rocks

A — Amphibolite

Heavily drift-covered area
Bedding (horizontal, inclined, vertical, dip unknown)
Gneissosity or schistosity (inclined, vertical, dip unknown)
Lineation
Fault (defined, approximate, assumed)
Glacial striæ
Mineral occurrence (iron, Fe; uranium, U) × Fe

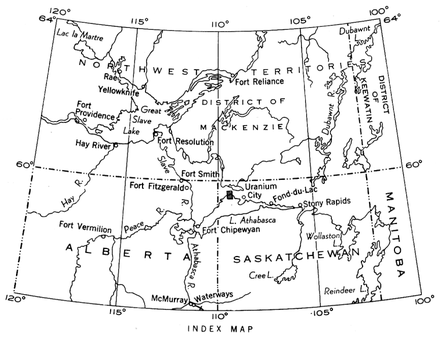
Geology by W. E. Hale, 1954

Trail
Marsh
Height in feet above mean sea-level .699

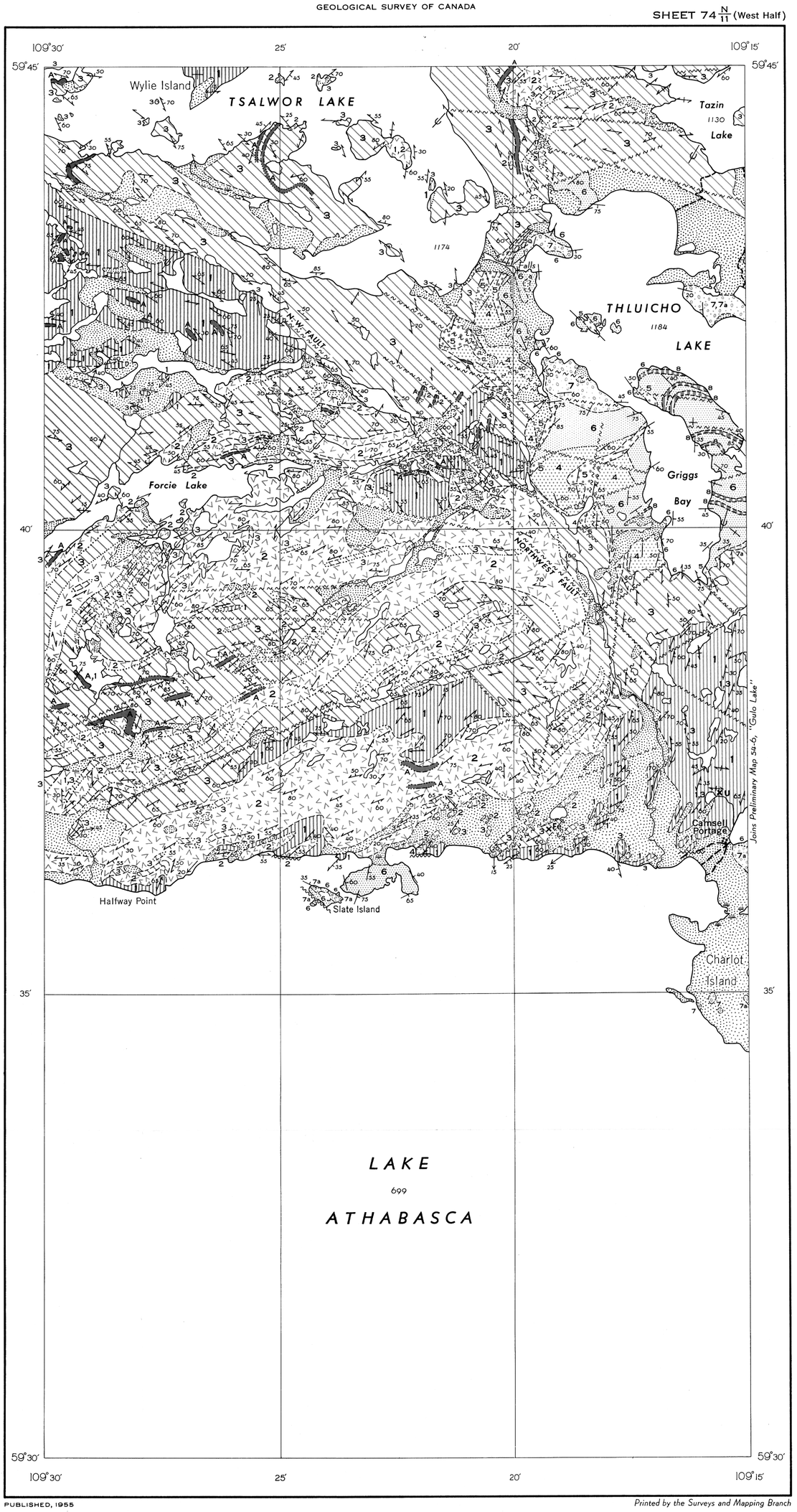
Approximate magnetic declination, 26°21′ East

Cartography by the Geological Cartography Unit, 1955

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



INDEX MAP



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PRELIMINARY MAP 55-4

FORCIE LAKE

(THLUICHO LAKE, WEST HALF)

SASKATCHEWAN

Scale: One Inch to One Mile = $\frac{1}{63,360}$

Miles
1 ½ 0 1 2 3

DESCRIPTIVE NOTES

The topographic features of this area are similar to those of the adjacent areas to the east. The general trend of ridges is northeasterly but along the eastern boundary it is northerly and in the northern part of the area northwesterly. These variations in the trend of linear topographic features reflect changes in the structure of the underlying rocks.

The rocks are similar to those of the nearby areas to the east. The Archæan-type rocks (1, 2, 3) are intimately associated with each other and their field relations indicate that these three groups represent, to a large extent, originally similar rocks that have been altered once, and more probably twice, by what is commonly referred to as the 'granitization process'. Distinction among these rocks is based essentially on the extent and character of the alteration. Relic structures typical of the Tazin rocks(1) are common in both the White Lake complex(2) and the reddish gneisses(3). Furthermore, reddish gneisses(3) identical in structure and texture with the White Lake complex(2) are common. Boundaries between these rocks (1, 2, 3) in many parts of the area, therefore, merely outline places where one of the three is predominant.

Four large areas are underlain by Tazin group rocks(1). In the southeast corner and east of the Northwest fault near Thluicho Lake, grey, green, and pink, fine- to coarse-grained, impure quartzitic gneisses have apparently been derived from interbanded quartzite and argillitic members. Amphibolitic lenses occur within these rocks and there are also irregular masses of red gneiss and pegmatite(3) that are either too small or too indistinct to be mapped separately. Tazin group rocks(1) west of the Northwest fault are, in general, pink to grey and greyish green, fine-grained, pronouncedly banded quartzites with interbanded amphibolitic layers. Porphyroblasts of garnet, black and green amphibole, and pink to grey, zoned feldspars are characteristic of some layers. The banding in these rocks is characteristically persistent but locally complexly folded. The banding in the quartzite and amphibolitic layers and their intimate interlayering indicate a sedimentary origin for both. These rocks(1) in places grade through a medium- to coarse-grained, fairly massive, porphyroblastic zone into the White Lake complex(2).

Medium- to coarse-grained, greyish black to greenish black amphibolite(A) occurs locally in bands of sufficient size to be mapped individually. Where this amphibolite(A) is interbanded with Archæan-type rocks(2, 3) other than those of the Tazin group(1) it appears to have been subjected to the same processes that converted the Tazin group(1) into the gneisses(2, 3). It is probable that the amphibolite(A) associated with the gneisses(2, 3) originated in the same way as the amphibolitic layers in the quartzite(1).

The White Lake complex(2) is similar to that in Gulo Lake map-area. In Forcie Lake map-area, however, the hypothesis that these rocks are derived, in large measure, from those of the Tazin group(1) is strengthened by the obvious gradations from massive granitic rocks with numerous 'wispy' inclusions of amphibolitic and biotitic material, as in that part of the area south and east of Forcie Lake, to coarse, porphyroblastic, banded, quartzitic gneiss that extends along the southern part of the area.

The reddish quartz feldspar gneisses(3) occur throughout the map-area and are obviously derived from other Archæan-type rocks (1, 2). Only small bodies of red granite and pegmatite showing intrusive relations with adjacent rocks were observed and these are of insufficient size to be mapped separately.

Athabasca rocks(4-7) are confined to three parts of the area; along the shore of Thluicho Lake, on Slate Island and the peninsula near it, and south of Camsell Portage. An angular unconformity separating the greywacke(6) from the upper conglomerate(7a) is well exposed at the west side of Slate Island. Faults partly control the distribution of the lower part of the series west of Thluicho Lake.

A noteworthy feature is the fresh appearance of the upper part of the series. Only negative evidence, the apparent absence of fossils, supports the assignment of this part of the series to the Precambrian.

Medium-grained, blackish grey to brown, diabase dykes were observed on the large peninsula in Thluicho Lake and one small dyke was noted on the west shore of the same lake. These dykes undoubtedly represent the continuation of the dyke swarm in Gulo Lake map-area. The swarm does not appear to extend west of Thluicho Lake and elsewhere in the area diabase is extremely rare.

The complexity of local structure in the Archæan-type rocks(1, 2, 3) and the general absence of distinctive boundaries between them makes structural interpretations uncertain. Layers in the northwestern part of the area dip northeasterly and the Tazin group rocks(1) there probably represent a preserved remnant of an overturned syncline.

South of Forcie Lake the structural relations of the reddish gneisses(3) and the White Lake complex(2) have only been determined where there are distinct boundaries. A southwesterly plunging anticline with a core of White Lake complex(2) occurs south of the east arm of Forcie Lake and this is succeeded to the south by a southwesterly plunging syncline containing mostly reddish gneisses(3).

There are four well-defined sets of faults; a northwesterly set, a northeasterly set, an easterly set, and a northerly set. On one northwesterly fault, west of Thluicho Lake, right-hand horizontal separation is indicated in two places. Another northwesterly fault is the contact between the reddish gneisses(3) and the Tazin group(1) northeast of Slate Island. Northeasterly faults commonly occupy drift-covered valleys. This set of faults is responsible, to some extent, for the distribution of the lower part of the Athabasca series(4-6). Several zones of intense brecciation mark an easterly trending fault along the shore of Lake Athabasca. Elsewhere the presence of easterly trending faults has been largely assumed on the basis of prominent linears that transect the 'grain' of the country. Several northerly trending faults occur near the east boundary of the map-area. It is not known which of the faults extending from the west side of Thluicho Lake is the extension of the Maimann-Garry Lakes fault observed in the two map-areas to the east.

Wide breccia zones occur along some of the faults, particularly those that trend northwesterly. Some of these zones are gossan-stained and brick-red hematite alteration has been noted in many places, one of which is along the contact of the reddish gneisses(3) and conglomerate(4) near the small bay that extends south from the west side of Thluicho Lake.

Magnetite veins with various amounts of pyroxene and serpentine occur in reddish gneisses(3) about 2 miles east of Slate Island and less than ½ mile inland. They vary from an inch to at least several feet wide and were observed extending intermittently in an easterly to northeasterly direction for at least 500 feet.

A radioactive pegmatite is being explored north of Camsell Portage. Abundant 'gummite' is evident on the surface and in pits. This body varies in outline. At its southern end it is a well-defined dyke about 20 feet wide but about 700 feet to the north, at the northern extent of exploration, it has a stock-like form and its boundaries with the surrounding Tazin group(1) are irregular.

The map-area as a whole has not been thoroughly prospected and it seems advisable in the light of present knowledge to prospect the complexly faulted part of the area west of Thluicho Lake.

PRELIMINARY MAP 55-4
FORCIE LAKE
SASKATCHEWAN
SHEET 74 $\frac{N}{11}$ (West Half)

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