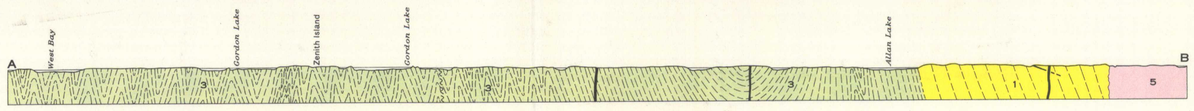
CANADA

DEPARTMENT OF MINES AND RESOURCES

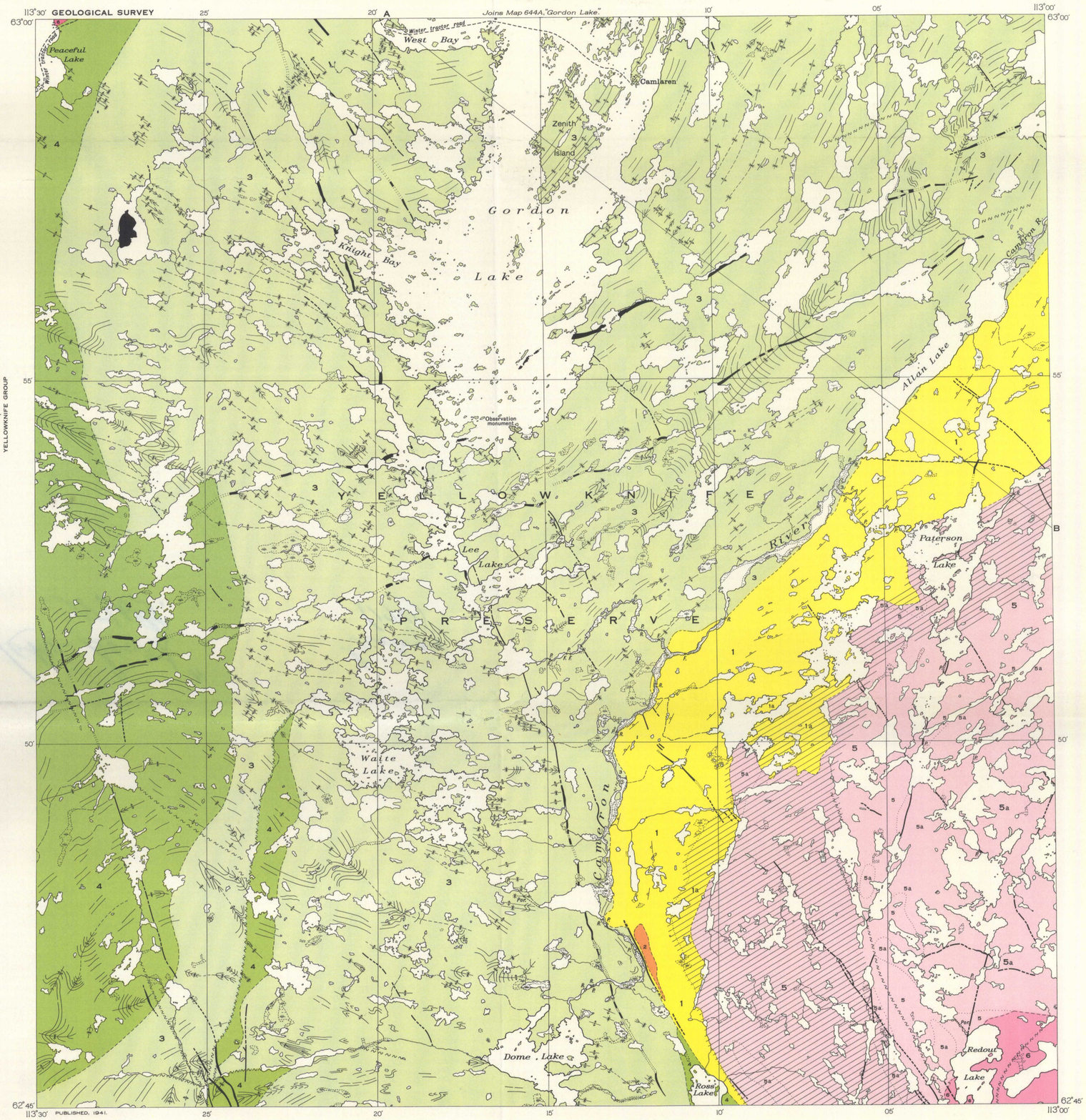
MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY



Structure section along line A–B
Horizontal and vertical scale the same as that of map.

GEOLOGICAL SURVEY



LEGEND

PROTEROZOIC (LATE PRECAMBRIAN)

- Diabase, gabbro, diorite
- 6 — Granite
- 5 — Granodiorite, quartz diorite and allied granitic intrusives; **5a**, granodiorite, etc. with abundant inclusions of hornblende and biotite gneiss and schist

ARCHEAN (EARLY PRECAMBRIAN)

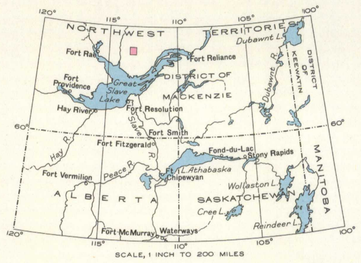
- 3 — Greywacke, slate, impure arkose and quartzite
- 4 — Knotted quartz-mica schist and hornfels derived from and grading into (3)
- 2 — Rhyolite, tuff and agglomerate
- 1 — Andesite and dacite, basalt, interbedded tuff and agglomerate; minor basic intrusives, **1a**, andesite, etc. cut by many granitic dykes

YELLOWKNIFE GROUP

- Area in which hornblende gabbro dykes are numerous
- Trend of bedding (Beds are steeply inclined to vertical throughout the area and in many places are overturned)
- Bedding (upper side of lava flow faces as indicated, direction of dip unknown)
- Anticlinal axis (observed, inferred)
- Synclinal axis (observed, inferred)
- Fault, shear zone
- Winter tractor road
- Portage
- Building
- Mine shaft
- Oil tank
- Observation monument
- Stream (position approximate)
- Fall and rapid
- Wharf
- Reef
- Marsh

Geology by J. F. Henderson, 1938, and 1939.

Base-map compiled by the Topographical Survey, 1939, from aerial photographs taken by the Royal Canadian Air Force, July and September, 1937. Cartography by the Drafting and Reproducing Division, 1941.



PUBLISHED, 1941.

MAP 645A

GORDON LAKE SOUTH

DISTRICT OF MACKENZIE
NORTHWEST TERRITORIES

Scale, 1/63360 or 1 Inch to 1 Mile
Miles 1 0 1 2 3

Approximate magnetic declination, 36° East.

DESCRIPTIVE NOTES

Most of the volcanic rocks (1) are older than the sedimentary formations (3, 4). They are greenstones similar to the pillowed lavas and associated pyroclastic rocks found in other parts of the region. Their contact with the granodiorite and quartz diorite is marked in places by a zone of greenstone (1a) cut by numerous dykes related to the intrusive mass and ranging from granodiorite to quartz diorite.

The division of the sedimentary rocks into relatively unaltered strata (3) and knotted quartz-mica schists and hornfels (4) is based on degree of metamorphism; a complete gradation exists between them. The greywacke, slate, impure arkose and quartzite are interbedded with one another and vary in proportions in different parts of the map-area. A narrow band of conglomerate occurs at the base of the sediments 3 miles south of the area east of the south end of Ross Lake. The conglomerate is apparently structurally conformable with the underlying volcanic rocks but may represent an erosion interval. Within the map-area no conglomerate was observed and sedimentary beds are intercalated with upper members of the volcanic assemblage and are succeeded by the main body of sedimentary strata without evidence of any erosional interval.

Alteration of the sedimentary rocks is marked by the development of mica flakes along cleavage planes, as a result of which the rocks split along glistening micaceous surfaces. The more massive strata do not cleave readily and form quartz-mica hornfels. Both mica schists and hornfels are characterized by abundant spherical or ovoid knots that represent stages in the formation of new minerals. The knots may be 2 or more inches long but average ¼ to ⅛ inch. They are usually more resistant to erosion than the enclosing rock and stand out conspicuously on the weathered surface but in some beds they weather away to give the rock a pitted appearance. The knots vary from an early stage of indefinite shadowy aggregation to an advanced stage in which they appear as well defined crystals of cordierite and chiastolite. These metamorphosed rocks retain much of their original sedimentary structure. Bedding is perfectly preserved and a gradation in grain size can be recognized in many beds.

Throughout the map-area the sediments lie in a series of steeply dipping, closely spaced, isoclinal folds that in many places are overturned. Synclinal and anticlinal axes were located by determining the tops of beds, chiefly by observing the change in grain size from coarse at the bottom to fine at the top of a bed. Lines on the map showing the trends of bedding were sketched from aerial photographs. The extremely close folding within the basin of Gordon Lake is due in part to the less competent, argillaceous character of the beds as compared with the more massive, sandy strata to the east and west where the folds are more widely spaced. Near the southern boundary of the map-area, close to their contact with the volcanic rocks north of Dome Lake, the beds are intensely contorted and drag-folded; elsewhere the fold axes are more nearly parallel over large areas. The folds plunge at steep angles and the direction of plunge reverses within short distances along many of the fold axes. The volcanic rocks also dip at steep to vertical angles and observations indicate that the flows all face west to northwest. Two well-defined sets of steeply dipping faults are recognizable, one striking about north 20 degrees west and the other about north 60 degrees east. Two sets of basic dykes occur parallel to the faults.

The granodiorite, quartz diorite and allied intrusive rocks (5) comprise a heterogeneous assemblage that varies in appearance and composition from place to place. They weather pink to grey and are composed of quartz, oligoclase, biotite or hornblende and some microcline. The quartz grains have a sugary, granulated appearance and the biotite flakes are broken. Large areas of granodiorite and quartz diorite contain abundant inclusions of hornblende-biotite gneiss and schist (5a). The inclusions vary from angular fragments to streaky, schlieren-like masses. Locally they make up as much as 50 per cent of an outcrop area.

Hundreds of hornblende gabbro dykes cut the granodiorite, quartz diorite and adjoining volcanic rocks between Ross and Paterson Lakes. The dykes range from less than a foot to more than 150 feet wide and strike in general about south 20 degrees west. They are dark green to black, medium to rather fine-grained rocks, composed of hornblende and labradorite. Some of the dykes carry scattered phenocrysts of white-weathering feldspar up to one and even two inches long.

The granite (6) is a medium to rather fine-grained, pink-weathering rock composed of quartz, microcline, orthoclase, oligoclase and biotite. Dykes and irregular offshoots of this granite cut the other granitic intrusives (5) and the hornblende gabbro dykes.

The basic dykes weather red-brown and are composed of about equal amounts of pyroxene and plagioclase.

Many quartz veins occur in the sedimentary and volcanic rocks. In the sedimentary rocks veins have been observed along the axial parts of isoclinal folds; along faulted drag folds and sheared slaty beds between those of more massive strata; and following bedding planes. Several veins have been found to carry gold but no deposits of commercial size and grade have yet been developed. The gold-bearing veins are sparsely mineralized with one or more of several sulphides including pyrite, pyrrhotite, arsenopyrite, chalcopyrite, sphalerite and galena.

645A