

- LEGEND**
- PROTEROZOIC**
- 9 Gabbro, in part diabasic or porphyritic
  - 8 Quartzite; minor arkose, pebble conglomerate, boulder conglomerate and mudstone
  - 7 Pyroxenite
  - 6 Granite to granodiorite, massive to poorly foliated, porphyritic in part, includes minor granite-gneiss
  - 5 Granite-gneiss, porphyroblastic in part; grades into banded gneiss and paragneiss; includes minor amounts of 2 and 6
  - 4 Pink to white granite and pegmatitic granite; includes minor gneiss and schist (3)
  - 3 Gneiss and schist derived primarily from sedimentary material, interlayered with pink to white granite and pegmatitic granite (4)
  - 2 Gneiss and schist derived from volcanic rocks (1) and sedimentary rocks, with minor granitic material
  - 1 Greenstone, amphibolite, andesite, dacite, rhyolite, and pyroclastic rocks; minor impure quartzite and stretched conglomerate
- ARCHEAN**
- 6 Granite to granodiorite, massive to poorly foliated, porphyritic in part, includes minor granite-gneiss
  - 5 Granite-gneiss, porphyroblastic in part; grades into banded gneiss and paragneiss; includes minor amounts of 2 and 6
  - 4 Pink to white granite and pegmatitic granite; includes minor gneiss and schist (3)
  - 3 Gneiss and schist derived primarily from sedimentary material, interlayered with pink to white granite and pegmatitic granite (4)
  - 2 Gneiss and schist derived from volcanic rocks (1) and sedimentary rocks, with minor granitic material
  - 1 Greenstone, amphibolite, andesite, dacite, rhyolite, and pyroclastic rocks; minor impure quartzite and stretched conglomerate

- Geological boundary (defined, approximate, gradational) - - - - -
- Limit of geological mapping - - - - -
- Boundary of areas of few or no outcrops - - - - -
- Bedding, tops known (inclined) - - - - -
- Gneissosity, schistosity (horizontal, inclined, vertical, dip unknown) - - - - -
- Fault (approximate, assumed) - - - - -
- Anticline (trace of crest plane) - - - - -
- Syncline (trace of trough plane) - - - - -
- Mineral occurrence - - - - - x Cu

- SYMBOLS FOR METALS OR MINERALS**
- Arsenopyrite - asp
  - Copper (stain) - Cu
  - Iron oxide (rusty zones) - Fe
  - Molybdenite - Mo
  - Pyrite - py

Geology by W.W. Heywood, S.E. Brett, K.L. Currie, and K.E. Eade, 1958

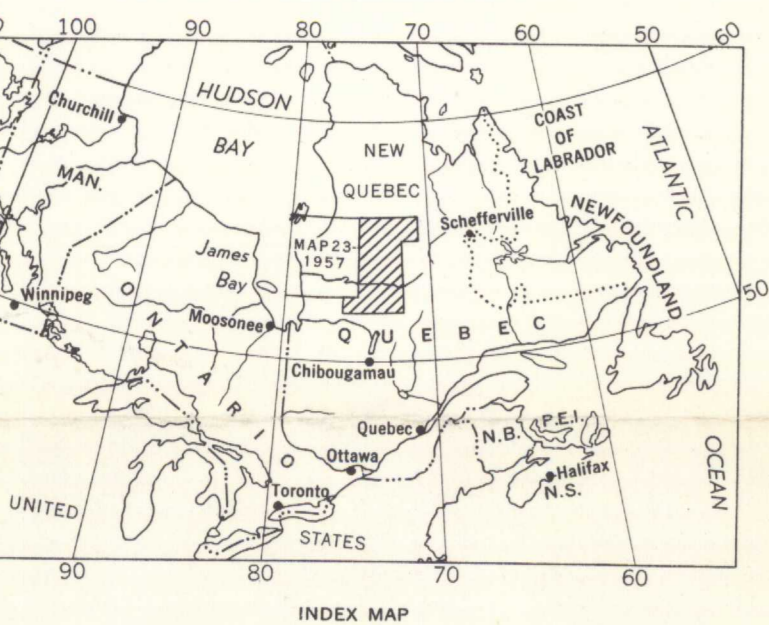
- Sand or mud - - - - -
- Marsh - - - - -
- Rapids - - - - -
- Height in feet above mean sea-level - 1700

Approximate magnetic declination, 25° 24' West

Cartography by the Geological Cartography Unit, 1959

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.



23-1958

GEOLOGICAL SURVEY OF CANADA  
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

MAP 23-1958  
**LA GRANDE-LAC BIENVILLE**  
NEW QUEBEC

Scale: One Inch to Eight Miles = 506,880  
Miles 0 4 8 16 24

Overlays Map 23-1957, "Saguenay Lake Area"

PUBLISHED 1959  
COPIES OF THIS MAP MAY BE OBTAINED FROM THE  
DIRECTOR, GEOLOGICAL SURVEY OF CANADA, OTTAWA

**DESCRIPTIVE NOTES**

The mapping of the La Grande-Lac Bienville area is an eastward continuation of the geological reconnaissance by helicopter, initiated in 1957 in the Saguenay Lake area. The centre of the map-area is approximately 270 miles north of Chibougamau, Quebec, and 270 miles southwest of Schefferville, Quebec. There are no settlements within the area but it is crossed by the Mid-Canada Defence Zone which lies along the 55th parallel. Transportation by air is the only practicable means of access; outcrop routes are long and difficult. Forest cover ranges from dense coniferous forests in the south to the semi-barrens in the north.

Previous geological work in this area was confined to observations along the Estmain River by A.P. Low. The volcanic rocks (9) are commonly altered to greenstone and amphibolite, but locally, andesite, dacite or rhyolite are present. Most of the volcanic rocks are of basic composition. Pyroclastics are interbedded with the volcanics. The rocks are light to dark green, weathering to various shades of brown and green, and chiefly fine grained. They are either massive or schistose and some contain pillow and rhyolite flow structures. The amphibolite types are mostly schistose whereas the recrystallized stone overlie gneiss (3) conformably, included with the volcanic rocks are minor amounts of interbedded sedimentary rocks consisting of impure quartzite and conglomerate with stretched pebbles in a schistose matrix.

The gneiss and schist of unit 2 comprise metamorphosed and granitized volcanic rocks (1), and to a lesser degree, sedimentary rocks. Included in these rocks are some amphibolites, probably derived from basic sills, dykes and flows. Granitic material is not abundant.

Rock unit 3 is formed of gneiss and schist derived primarily from sedimentary rocks interlayered with white to pink granite and pegmatitic granite. This unit includes minor amounts of grey granite-gneiss (5) as these rocks are gradational into one another. Grey quartz-schist, and less commonly, quartz gneiss of similar composition with grey weathered surfaces, grades into a grey gneiss layered granite, while locally pink granite, is medium grained to coarse grained or pegmatitic. It contains only small amounts of either hornblende or biotite, although the latter predominates in outcrop, as it is more resistant to weathering, it probably constitutes less than half of the rock mass.

A few small plutons of granite (4) occurring within unit 3 are probably segregations of the same granite that is interlayered with the schist and gneiss. This is a massive, microcrystalline, pink to white, and medium to coarse grained, grades into banded gneiss and paragneiss. Compositionally, it ranges from granite to granodiorite, and less commonly, quartz diorite. It is commonly porphyroblastic. Both pink and grey types are present, the pink types predominating in the granite-gneiss. Mafic inclusions of all sizes, consisting of hornblende, plagioclase and hornblende and biotite are present but hornblende predominates in the granite-gneiss and biotite in the banded gneiss and paragneiss. The rockline foliation is more abundant in the granite-gneiss. Small areas of massive granite (6) grading into the granite-gneiss (5) have been mapped with the latter.

Massive granite and granodiorite (6), porphyritic in part, is locally foliated. These rocks are mostly pink, less commonly white to grey, with hornblende and biotite. They are commonly altered to greenstone and amphibolite, but locally, andesite, dacite or rhyolite are present. It is probable that this unit includes massive granite of more than one type and that some of the massive granite is gradational into granite-gneiss (5) and this granite and the granite-gneiss are in part derived from the medium-grained leucocratic granite, included in unit 6 has intruded and partly absorbed granite-gneiss (5).

A small pluton of pyroxenite (7) occurs in the southwest part of the map-area.

Four small areas of younger sedimentary rocks (8) probably represent downfaulted blocks of an unconformable quartzite over the granite and granite-gneiss. The only contacts observed are along quartzite, chiefly pink, with grey, locally red, is biotite-conglomerate and red mudstones are also present. Well preserved mud-cracks occur in the mudstones and ripple-marks and crossbedding are present in the quartzite. The bedding dips gently, commonly 10 degrees or less, except in the vicinity of contacts where faulting has disturbed the rocks. Their metamorphism has been slight in contrast with surrounding granite-gneiss and gneiss. A section of more than 1,700 feet of sedimentary rocks is present.

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Major folds, as well as numerous minor folds, are present in gneiss and schist (3) and granite-gneiss (5), but lack of information due to reconnaissance nature of the mapping and great cover, and scarcity of outcrop, makes them difficult to outline. In general, the trend of the folding is 20 degrees north of east to east. Open folds predominate and only in the south section is there evidence of overthrusting and isoclinal folding. Some correlation exists between the folded structures and the outcrop pattern of granite (6) and granite-gneiss (5) and of gneiss and schist (3).

Faults of large vertical displacements, trending northeast, form the contacts between granite-gneiss (5) or granite (6) and the younger sedimentary rocks (8). The thickness of the exposed sedimentary sections, more than 1,700 feet in one place, indicates a fault, trending about 25 degrees east of north and cutting granite-gneiss (5) and gneiss and schist (3), is indicated in the south-central section. Small shears are common, particularly in volcanic rocks (1).

Jointing is abundant, particularly in the massive granite (6) and the granite-gneiss (5). Sub-horizontal sheeting is characteristic in the massive granite. Main lineaments, visible on the air photographs of the region and examined on the ground, may underlie by greenstone (1), amphibolite (2) and granite-gneiss (5). Within the granite-gneiss the rusty zones occur where limonite is derived from biotite, disseminated magnetite and/or pyrite. Shear zones in the greenstone and amphibolite contain massive to disseminated pyrite. Locally, minor amounts of arsenopyrite and copper occur. Northeast of Lac Savolles a mineralized shear zone which is more than 1,000 feet long. Quartz veins are rare. A minor amount of molybdenite occurs in a quartz vein north of Corvette Lake. Barren quartz veins are numerous locally in the arkose and quartzite east of Lac D'Iberville.

<sup>1</sup>Saguenay Lake area, New Quebec, Geol. Surv., Canada, Map 23-1957.

<sup>2</sup>Air Navigation Orders, Series V, No. 14, Part IV, Dept. of Transport, 1957.

<sup>3</sup>Low, A.P.: Report on explorations in the Labrador Peninsula along the Estmain, Koksoak, Hamilton, Manicougan, and Portions of Other Rivers, Geol. Surv., Canada, Ann. Rept., n.s., vol. 8, Rept. 1, 1895.

MAP 23-1958  
**LA GRANDE-LAC BIENVILLE**  
NEW QUEBEC

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