

- LEGEND**
- CENOZOIC**
- PLEISTOCENE AND RECENT**
- 8 Drift
- 7 Massive, fine- to medium-grained, leucocratic granite, quartz monzonite, and granodiorite; 7a, includes syenite, quartz diorite
- 6 Gabbro, diorite, hornblende
- 5 Foliated medium- to coarse-grained granodiorite, quartz monzonite, and minor diorite; 5a, porphyritic, porphyroblastic
- PRECAMBRIAN**
- 4 Paragneiss, lit-par-lit gneiss, migmatite
- 3 Iron-formation
- 2 Metasedimentary rocks; derived schists
- 1 Metavolcanic rocks, minor metasedimentary rocks, and undifferentiated basic intrusions; derived schists; in part younger than 2.1a, migmatitic

- Sand plain
- Rock outcrop
- Geological boundary (approximate, assumed)
- Bedding, tops known (inclined, vertical)
- Foliation (inclined, vertical, dip unknown)
- Lineament (from air photographs)
- Fault (approximate)
- Joint (inclined, vertical)
- Glacial striae (direction of ice-movement known)
- Drumlin, drift ridge
- Esker
- Glacial-lake beaches
- Major moraine
- Area of small moraines
- Gold mine (producing, past producer)

MINING PROPERTIES

1. McKenzie Red Lake
2. McManis
3. Gold Eagle
4. Cochenour Willans
5. Hasaga
6. Howey
7. H. G. Young
8. Campbell Red Lake
9. Dickenson
10. Uchi Lake
11. Jason

Geology by Ontario Department of Mines (see references);
J. A. Donaldson, 1959; G. D. Jackson, 1962

Compiled by J. A. Donaldson, 1963

Geological cartography by the Geological Survey
of Canada, 1967

- Road, all weather
- Other roads
- Trail
- Cart track
- Airstrip
- Anchorage
- Post Office
- Power transmission line
- Township boundary (surveyed, unsurveyed)
- Indian Reserve boundary
- Intermittent stream
- Rapids, falls
- Marsh
- Contours (interval 100 feet)
- Height in feet above mean sea-level

Base-map compiled and drawn by the Surveys
and Mapping Branch, 1963

Magnetic declination 1967 varies from 0° 35' easterly
at centre of east edge to 0° 51' easterly, at centre of
west edge. Mean annual change increasing 0.3°



DESCRIPTIVE NOTES

Highway 105 connects Red Lake, in the southwest corner of the map-area, with the Trans-Canada Highway. Bus service to Red Lake is provided from Red Lake Road on the Canadian National Railways, and Vermilion Bay, on the Canadian Pacific Railway. Red Lake is also served by scheduled passenger flights from Winnipeg and Kenora. Many parts of the map-area may be conveniently reached by canoe, and float planes are available for charter at Red Lake.

The most prominent topographic feature in the map-area is the moraine west of Trout Lake. Abandoned beaches that represent levels of Lake Agassiz flank both sides of the moraine at coincident elevations. The highest beach is more than 200 feet above Trout Lake. Discontinuous beached areas along a belt from Kirkness Lake to the northern boundary west of Trout River probably represent a washed extension of the moraine. The minor moraines are sandy boulder ridges 10 to 25 feet high, spaced at remarkably regular intervals. Although outcrops are small, they are relatively evenly distributed outside the heavily drift-covered areas. The latest direction of glacial advance ranges from west in the northern part of the map-area to southwest in the southern part. Metavolcanic rocks (1) are mostly fine grained, dark green to greyish green basaltic flows, commonly pillowed, in which actinolite, oligoclase, and epidote or clinzoisite have taken the place of pyroxene and calcic plagioclase. Intermediate varieties containing lesser amphibole but some quartz and biotite are locally abundant, and very fine-grained, light-weathering porphyritic acid flows are exposed east of Fly Lake, south of Shabumeni River, and within the Red Lake belt. Migmatitic zones (1a) north of Berens Lake contain fine-grained amphibolites interlayered with granitoid rocks and minor metasedimentary rocks. The boundaries of this poorly exposed belt are based mainly on aeromagnetic data. The metasedimentary rocks (2) comprise quartzite, argillite, slate, and conglomerate. Most parts of the map-area underlain by units 1 and 2 have been mapped in detail by the Ontario Department of Mines.

Banded iron-formation (3), consisting of fine-grained interbeds of quartz, magnetite, and iron silicates, is exposed east and southeast of Balmer Lake, north of Uchi Lake, west of Woman Lake, north of Blindin Lake, and near the east end of Birch Lake. Because of strong magnetic attraction, the belts of iron-formation commonly can be traced in drift-covered areas with the use of the aeromagnetic maps.

Pronounced mineralogical layering suggestive of relic bedding characterizes the hybrid gneisses. They are predominantly fine grained, grey and dark weathering, and contain abundant biotite and/or hornblende. Many bodies of hybrid gneiss, too small to be shown, occur within map-unit 5.

Medium- to coarse-grained granodiorite, quartz monzonite, and quartz diorite (5) underlie more than half the map-area. Representative rocks of this unit contain 35-70% plagioclase, 10-45% quartz, 0-15% microcline, 5-15% biotite, 0-15% hornblende, and minor epidote, sphene, apatite, magnetite, and pyrite. The total mafic content is generally less than 20%, and biotite almost invariably exceeds hornblende. Most rocks of map-unit 5 exhibit massive-weathered surfaces, but well-developed foliation, marked by planar disposition of mineral grains, can commonly be seen on fresh surfaces. Fresh and weathered surfaces range from grey for the quartz diorites to salmon pink for the quartz monzonites. Map-unit 5a is characterized by subhedral to euhedral crystals of microcline as much as 5 centimetres long. Porphyroblastic growth is suggested where these large crystals are aligned in a prominent foliation, show no evidence of granulation, and engulf islands of the groundmass.

Massive, medium- to coarse-grained basic rocks (6) occur as scattered plugs, sills, and irregular bodies. Some small, isolated, and irregular bodies have gradational boundaries, and probably represent mafic zones of this unit rather than intrusions. Clearly defined intrusions younger than the foliated rocks (5) but cut by the massive rocks (7) were recognized, but some mafic bodies within the greenstone belts probably are older than the granitoid foliates. Most of the mafic rocks are greyish green to dark green hornblende- and biotite-bearing gabbros containing 40-65% plagioclase, but some bodies, such as the one south of Joyce Lake, contain phases approaching ultramafic composition.

Fine- to medium-grained equigranular granite, quartz monzonite, and granodiorite (7) compose large masses that truncate foliations in older rocks. They are characterized by a paucity of ferromagnesian minerals and an absence of regional foliation. Granodiorite is the least abundant rock type; representative specimens contain 30-50% microcline, 15-30% oligoclase, 30-35% quartz, 0-5% biotite, and minor muscovite, magnetite, and epidote. The rocks are typically pale pink, but this colour is due mostly to hercynite staining of the plagioclase rather than to an abundance of pink potash feldspar. Apatite and pegmatite dykes of similar composition are abundant throughout the area, and have been seen to cut all other rock types. Large masses of pegmatitic granite, which show striking graphic intergrowths of quartz and potash feldspar, outcrop east of Kirkness Lake. Syenite and quartz diorite (7a) occur within stocks of the Birch Lake area.

There were at least two periods of folding in the Red Lake and Birch Lake areas. Northeast-trending folds at Red Lake have been crossfolded along northwest-trending axes, and the west-trending belt of volcanic rocks north of Springpole Lake, which arcs southwest along Woman and Confederation Lakes, is apparently interrupted by northwest-trending crossfolds along Shabu and Blindin Lakes. Two near-vertical regional joint sets, which trend approximately northwest and northeast, cut all rocks in the map-area. Prominent lineaments, a few of which are shown on the map, closely correspond in trend to joints measured in outcrops. The mapped faults are marked by zones of mylonitization and rock alteration.

There are five producing gold mines in the Red Lake district. One of these, Maden Red Lake Gold Mines, is just south of the map-area, west of Highway 105. Most of the gold occurs in quartz or quartz-carbonate veins and lenses, associated with sulphide minerals. Rewarding exploration and development continues around Red Lake, but the Birch Lake area has received little attention since closing of the mines in that area. The basic intrusive rocks commonly contain sparsely disseminated pyrite. Pegmatite dykes and quartz veins carrying a few flakes of molybdenite outcrop on the south shore of the Berens River, one mile downstream from the confluence with Windfall Creek.

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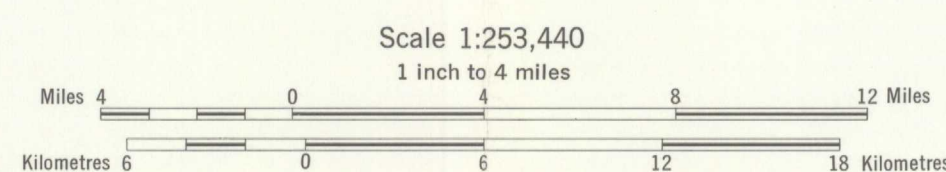
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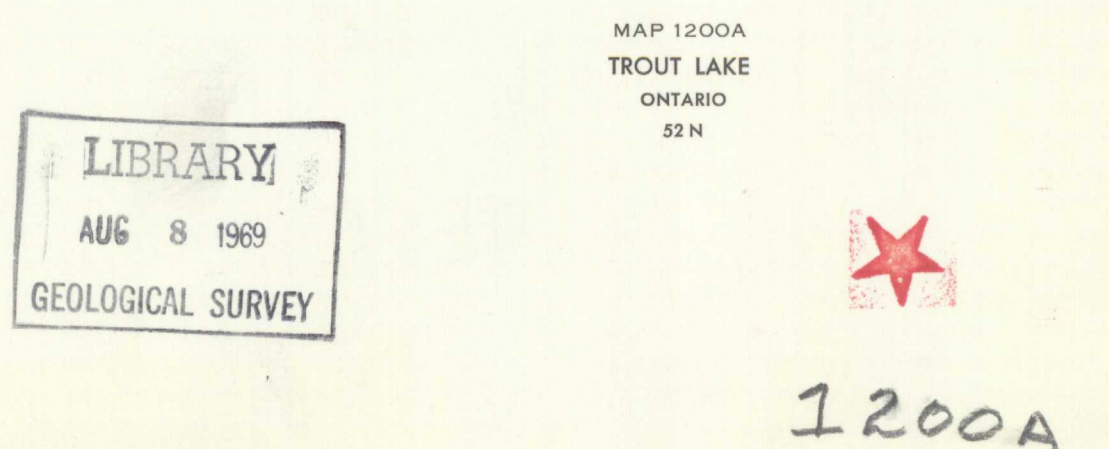
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MAP 1200A
GEOLOGY
TROUT LAKE
ONTARIO



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Ontario Trout Lake
1 inch to 4 miles
Map