GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 52 O

LEGEND

PRECAMBRIAN

- 8 — Undivided granitic rocks; includes 4, 6, and 7
- 7 — Massive granitic rocks; mainly granite but includes some granodiorite and syenite; 7a, local porphyritic varieties
- 6 — Porphyritic granitic rocks; mainly massive, but includes foliated varieties, i.e. porphyritic equivalents of 4 and 7
- 5 — Basic intrusive rocks; gabbro, diorite; minor ultramafic rocks
- 4 — Foliated granitic rocks, chiefly granodiorite; includes some granite and quartz diorite
- 3 — Iron-formation
- 2 — Metasedimentary rocks; derived schists and gneisses; 2a, conglomerate. In part older than 1
- 1 — Chiefly mafic meta-volcanic rocks; minor mafic intrusive and metasedimentary rocks; 1a, volcanic breccia

Heavily drift-covered area
Sand
Geological boundary (approximate)
Bedding (inclined, vertical)
Foliation (inclined, vertical, dip unknown)
Lineament (from air photographs)
Glacial striae
Drumlin, drift ridge
Esker
Small moraine
Mine ..... GOLD
Prospect ..... GOLD

Geology by R.F. Emslie, 1960

Cartography by the Geological Survey of Canada, 1961

Gravel road
Trail or portage
Power line
District boundary
Surveyed line
Indian Reserve boundary
Marsh
Rapids
Height in feet above mean sea-level 1218

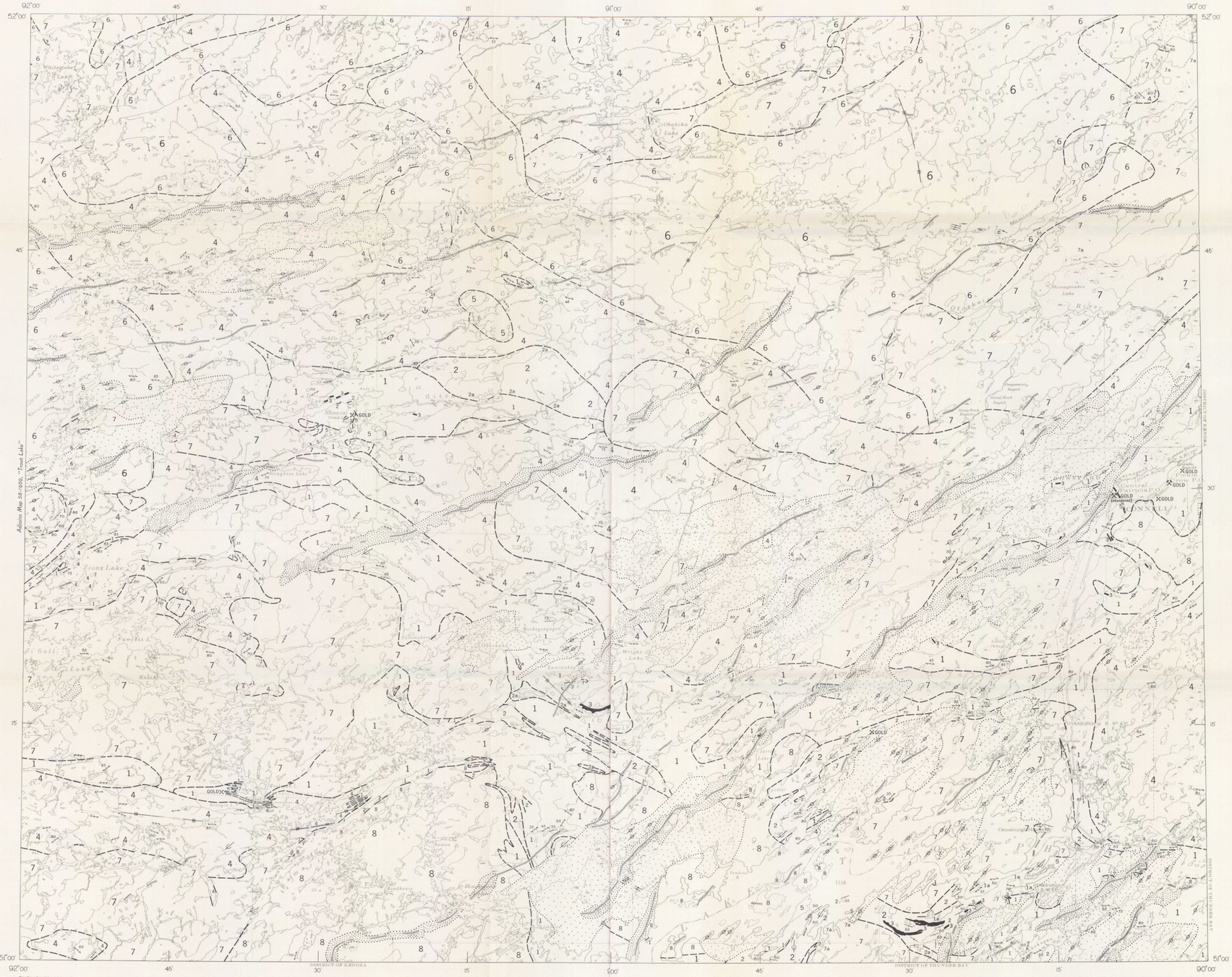
Base-map prepared by the Surveys and Engineering Branch, 1942

Approximate magnetic declination, 2° 08′ East

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

In response to public demand for earlier publication, Preliminary Series maps are issued in this simplified form and will be clearer to read if all or some of the map-units are hand-coloured

INDEX MAP



DESCRIPTIVE NOTES

Access to the area is provided by a gravel road from Savant Lake, on the Canadian National Railways, to Pickle Lake - a distance of 110 miles. Alternatively, the area may be reached by aircraft from Sioux Lookout, Red Lake, and other points in northwestern Ontario. Several companies maintain air bases at Pickle Lake, which is a locus for travel to the north. Most of the waterways are navigable by canoe so that few parts of the area are inaccessible. Smaller streams are difficult to travel, particularly at low water, because of many boulder-strewn rapids.

Relief is slight, commonly about 50 feet, with isolated hills rising 200 to 300 feet above their surroundings. A heavy blanket of glacial deposits has further served to subdue the bedrock topography so that outcrops are sparse in some parts of the area. Glacial trends, as represented by striae, drumlinoid ridges, and eskers, were southwesterly across the area.

The volcanic rocks (1) are chiefly fine-grained dark grey to grey-green basalts; pillowed varieties are common. Volcanic breccias and associated pyroclastic rocks (1a) are widespread, but at only one locality are they abundant—on the south shore of Lake St. Joseph. Sporadic occurrences of acid volcanic rocks are interbedded with the basic varieties. These rocks are light weathering, fine grained, rich in quartz and feldspar, and commonly exhibit a discontinuous biotite foliation. Phenocrysts of quartz and feldspar are prevalent. Exposures southeast from Slate Falls to Bamaji Lake are probably part of a thick acid volcanic wedge extending east to interfinger with the basic lavas. Westerly, these acid volcanic rocks finger out in strongly foliated granodioritic rocks. Flow structures, porphyritic flows, fragmental beds and some finely bedded tuff can be seen in the exposures. Lack of information prevents mapping these rocks separately as an acid volcanic unit; it is included with the foliated granitic rocks (4) following previous work by Harding (1935).

The metasedimentary rocks (2) are, in general, fine-grained, impure, siliceous rocks. The presence of staurolite and kyanite, as on the south shore of Lake St. Joseph and southeast of Drum Lake, indicates that pelitic beds did occur in places. Locally, some very dark tuffaceous beds are interbedded with volcanic rocks. Primary sedimentary structures are not common, but some examples of crossbedding and graded bedding were observed. Conglomerate (2a) occurs south of the iron deposits on Lake St. Joseph, at Billet Lake, and in the vicinity of the Gitche River.

Iron-formation (3) is common in small amounts, generally interbedded with the volcanic sequences. Typically it consists of very fine grained quartz or chert and magnetite, delicately banded. The most significant occurrence, however, is in a sedimentary sequence on the south shore of Lake St. Joseph. There the iron-formation is largely quartz and magnetite but it is intimately associated with high-grade regional metamorphic schists and gneisses, bearing garnet, staurolite, and cordierite. The iron-formation on the north shore of Jackknife Lake is described by Harding (1935) as being 100 to 300 feet thick but of greater apparent thickness due to squeezing and folding. Iron-formations are known to occur in most of the greenstone belts.

Foliated granodioritic rocks (4) are widespread. Variations in quartz and mafic-mineral content result in the presence of granite and quartz diorite locally. Biotite is the most common mafic accessory mineral. Hornblende may be present; in a few cases it predominates over, or occurs to the exclusion of, biotite. Associated volcanic and sedimentary belts mostly display foliations concordant with these rocks. Well-banded gneiss, though rare, occurs locally in this unit.

Several masses of gabbro (5), with accompanying dioritic phases, are present. The large body on the Otoskwin River southeast of Morris Lake contains some anorthositic gabbro. The sill-like mass underlying the peninsula north of Pedlarpath Bay has ultramafic rocks on the north side and igneous layering dipping steeply to the southeast. Small gabbro sills and dykes are numerous in the volcanic and sedimentary rocks but are too small to show on the map.

Porphyritic granitic rocks (6) have large potash-feldspar phenocrysts—generally between 1/2 inch and 2 inches across—that comprise more than 15% of the rock. These porphyritic rocks predominate in the northern half of the map-area. Commonly they pass into massive equigranular rocks identical in appearance except for their lack of phenocrysts. The porphyritic rocks are predominantly massive but in some areas are well foliated. The unit thus contains the porphyritic equivalents of both units 4 and 7.

Massive, fresh, equigranular granite (7) and associated aplites and pegmatites cut all other rocks. These rocks are commonly foliated near their contacts or adjacent to inclusions, but a widespread, persistent foliation is lacking. They are commonly pink, potassic rocks, and where locally quartz is scarce, their composition approaches that of a syenite. Similarly granodiorite occurs as a local variety. Limited areas of porphyritic granite are mapped as unit 7a, being too small to map as unit 6.

In areas shown as unit 8, information was not sufficient to permit subdivision into different types of granitic rocks.

Aeromagnetic maps were used freely as an aid in drawing boundaries between the rock units.

Pickle Crow Gold Mines Ltd. has been producing since 1934 and is at present the only operating mine in the area. The gold occurs free in irregular quartz veins cutting mafic pillowed lava flows and interbedded iron-formation.

Central Patricia Gold Mines Ltd. produced from 1931 until 1951 when known ore reserves were exhausted.

During the summer of 1960, Steep Rock Iron Mines Ltd. carried out a drilling program on their property on the south shore of Lake St. Joseph. They were successful in outlining a large deposit of low-grade magnetite ore amenable to concentration. The extent of the potential ore zones at this locality has been indicated on the map from drilling information supplied by the company.

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MAP 1-1960

GEOLOGY

LAKE ST. JOSEPH

KENORA AND THUNDER BAY DISTRICTS

ONTARIO

Scale: One Inch to Four Miles = 1/253,440

4 2 0 4 8 12 Miles

MAP 51-1960
LAKE ST. JOSEPH
ONTARIO
SHEET 52 O