

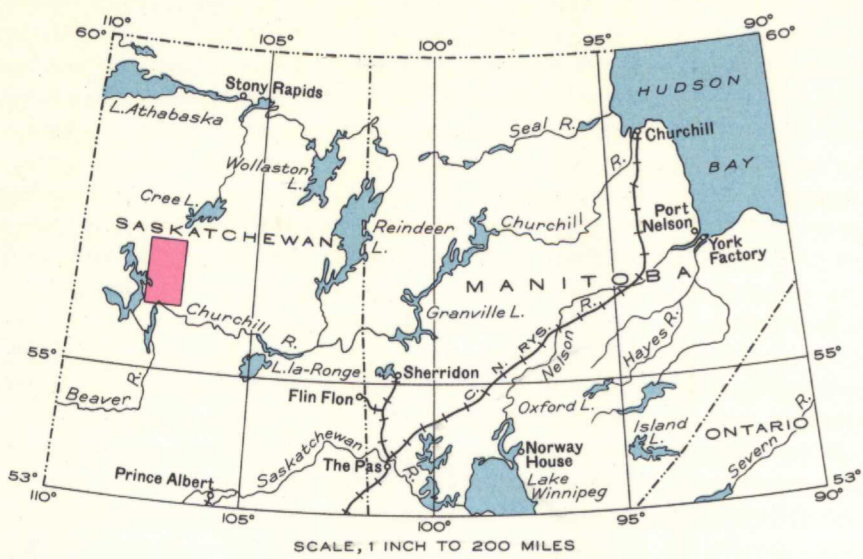
LEGEND

- ARCHEAN (EARLY PRECAMBRIAN)
- 4 Mainly granite and granite-gneiss
  - 3 Mainly hornblende, gabbro, pyroxenite and serpentine; some sediments
  - 2 Andesite, hornblende schist, hornblende gneiss
  - 1 Biotite and biotite-garnet gneiss and schist, quartzite, argillite and limestone (partly granitized)
- 5 (Undivided)

- Area of outcrop and small outcrop in part examined and in part sketched from aerial photographs
- Recessional moraine
- Geological boundary
- Fault
- Glacial striae
- Winter road, trail, or portage
- Stream (position approximate)
- Fall and rapid
- Marsh
- Height in feet above Mean sea-level

Geology by F. J. Alcock, 1934, (published 1935); J. C. Sproule, 1937; and by D. L. Downie, 1938.

Base-map prepared by the Topographical Survey, 1936, from Federal Government map published in 1933. Cartography by the Drafting and Reproducing Division, 1940.



DESCRIPTIVE NOTES

The area may be entered by aeroplane or by canoe. A road suitable for motor trucks leads from the railway terminus at Meadow Lake to Beaver river, which provides a good water route to Ile à la Crosse lake. From this lake it is possible to travel either down Churchill river and up Mudjatik river, or through Churchill lake into Frobisher lake. Another canoe route leads from Big River at the end of the railway, through Cowan lake, down Cowan river, and thence to the Beaver.

Over the greater part of the area the surface is marked by many low rocky hills, the depressions between which have been partly filled by sandy glacial debris. There are also numerous areas of sand plains, particularly along the basins of Mudjatik and Gwillim rivers and south of Frobisher lake. The northern part of the area is crossed by a long, broken, recessional moraine that has been traced northwesterly into and across the neighbouring Upper Clearwater River map-area. On the north slope of this moraine, south of Black Birch lake, glacial lake beaches are very well developed. South of the moraine there are many narrow, sharp ridges, principally of sand and fragments of sandstone, lying closely parallel to one another and normal to the direction of ice movement, which was southwesterly. Some of these ridges converge at acute angles and others connect with esker-like ridges, but for the most part they are separate and distinct features. They vary from a few yards to 3 miles in length and from a few inches to 35 feet high.

Dipper lake, the lowest point in the area, is about 1,290 feet above sea-level, and the greatest elevation, on the highland east of Gwillim lake, is approximately 1,760 feet. Maximum local relief is about 500 feet.

Except for open muskegs and recent burns most of the area is heavily wooded. Black spruce, the most abundant tree, occurs mainly on low wet ground or on high rocky areas. Rock and boulder-clay ridges support poplar and birch. Banksian pine grows best on dry sandy soil. Tamarac and white spruce occur in isolated stands.

The oldest rocks observed (1) are biotite and biotite-garnet gneiss and schist, quartzite, argillite and crystalline limestone. The schists and gneisses are commonly light-grey to black and for the most part occur as alternate bands of fine-grained dark, and coarse-grained light (frequently pegmatic) material. The quartzites have lost most of their original structures but some, as on Ithingo peninsula, show cross-bedding. Limestone is known in only a few localities. Where least altered the limestone is a coarsely crystalline marble, but near granitic intrusives it holds light-green diopside, tremolite, scapolite, quartz, and scattered epidote, and, in the more impure bands, biotite and graphite. The sediments included in group 3 are the same as those of group 1.

The volcanic rocks (2) in the vicinity of Vermilion lake are partly altered to coarse and fine-grained hornblende schist and grade southward through a contorted zone of silicified hornblende and biotite schists into hornblende and biotite gneiss and granite.

The basic intrusives (3) are commonly associated with the sedimentary rocks. They also occur in masses and bands as inclusions in granite-gneiss and granite and are intersected by dykes of granite and pegmatite. Most of the basic intrusives have been altered to hornblendites. Less altered types include varieties of pyroxenite and serpenitized pyroxenite, generally carrying some magnetite and pyrrhotite. The age relations between these rocks and those of the volcanic group (2) are not known.

Most of the above-mentioned formations are steeply inclined, much altered, and have been extensively granitized, thus forming a mixed assemblage of rocks (5). Included with the acid intrusives (4) are minor amounts of diorite and pegmatite, and small remnants of older rocks.

In the vicinity of Vermilion lake and Black Birch lake there are several small sulphide deposits, all of which yield traces to a few cents in gold. These include a rusted 4-foot zone of vein quartz with arsenopyrite, in rotted and vuggy volcanic rocks exposed on the south shore of Vermilion lake near a small limestone island; a small deposit of pyrite and arsenopyrite, interleaved with decomposed schist and gneiss lying on the southwest border of the Vermilion Lake greenstone; quartz veins carrying sulphides, and many small deposits of sulphides occurring in the gneissic sediments of Ithingo peninsula; bedded limestones in the west arm of Ithingo lake and on an island in Vermilion lake containing sparse disseminations of magnetite, pyrite, chalcopyrite, arsenopyrite, and pyrrhotite; a large quartz vein cutting gneiss two miles south of Ithingo lake—the quartz contains numerous crystals of pyrite and is quite vuggy, apparently as a result of the solution of pyrite; and a few small deposits of pyrite, pyrrhotite, and chalcopyrite, and others of magnetite, occurring in the area of contorted rocks east and south of Porter lake.

MAP 580A  
**PORTER LAKE**  
NORTHERN SASKATCHEWAN  
Scale, 253,440 or 1 inch to 4 Miles  
Approximate magnetic declination, 23° to 27° East.

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