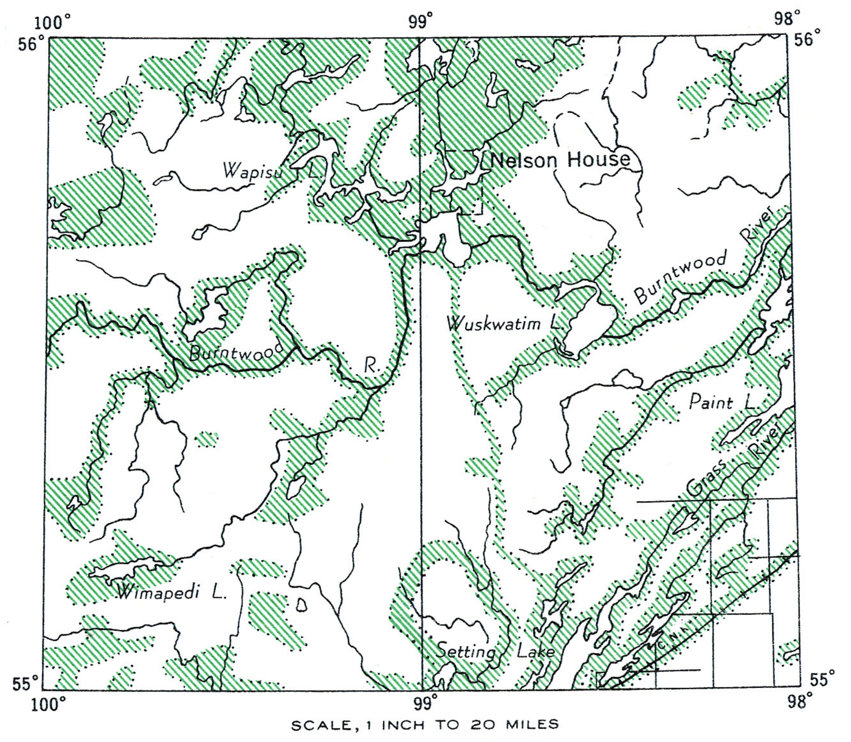
CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

SHEET 63 O



Area covered by shoreline and land traverses indicated thus . . . .
Geology of remaining area inferred from aerial reconnaissance and study of air photographs

LEGEND

CENOZOIC

- 11 — Delta deposits; mainly sand and gravel; minor cobbles and boulders
- 10 — Undifferentiated drift; includes much lacustrine varved clay

PROTEROZOIC

- 9 — Small basic dykes; gabbro, olivine gabbro

ARCHÆAN AND (?) PROTEROZOIC

- 8 — Pegmatite; minor aplite
- 7 — Altered basic to ultrabasic rocks; peridotite, pyroxenite, gabbro, hornblendite; minor serpentinized volcanic rocks
- 6 — Granite, granodiorite, syenite, and allied rocks; abundant inclusions of 2 and 4
- 5 — Mixed gneisses: hybrid gneiss; granitized paragneiss and minor amphibolite; lit-par-lit gneiss; migmatite; cordierite-biotite gneiss
- 3 — Mainly basic to intermediate volcanic rocks: basalt, andesite, tuff; greenstone; minor undifferentiated 1
- 4 — Hornblende-plagioclase gneiss; amphibolite; in part probably derived from 3
- 1 — Mainly sedimentary rocks; quartzite, arkose, greywacke, argillite, slate; minor crystalline limestone, iron formation, chert, hornblende-quartz-carbonate gneiss and hornblende-plagioclase-carbonate gneiss; minor undifferentiated 3
- 2 — Sedimentary gneiss and schist (mainly nodular): mainly garnetiferous quartz-biotite-plagioclase gneiss; quartz-biotite gneiss; minor garnet-sillimanite-biotite schist and staurolite-quartz-mica schist; mainly or entirely derived from 1

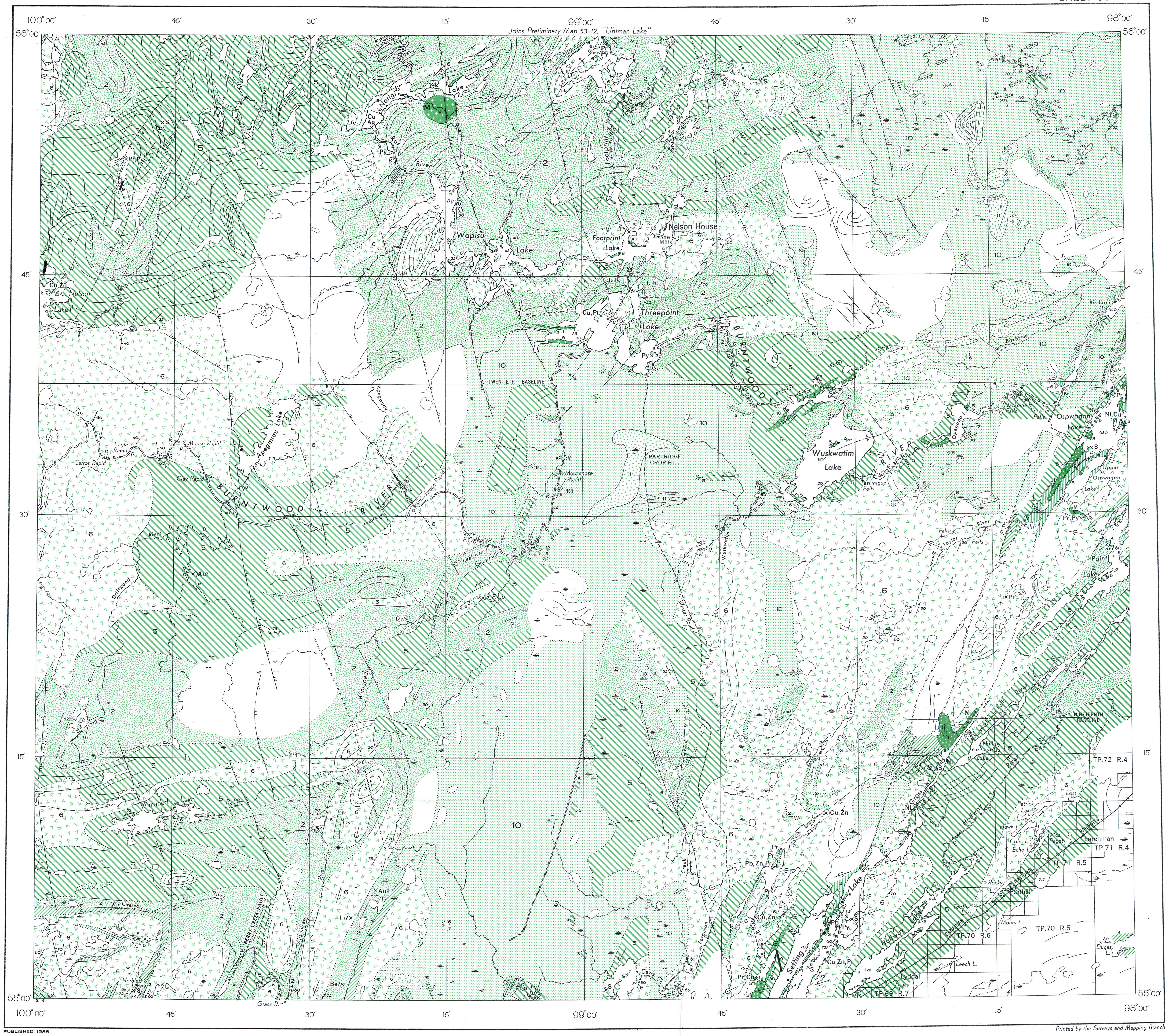
Bedding (inclined, vertical, dip unknown)
Gneissosity (inclined, vertical, dip unknown)
Structural trend (inclined, vertical, dip unknown)
Lineation (plunge known) . . . 50
Lineament
Fault (defined, assumed)
Anticlinal axis
Synclinal axis
Glacial striæ
Glacial striæ (bearing known, direction of movement unknown)
Drift ridge
Esker
Kettle . . . K
Abandoned beaches (from air photographs)
Magnetic attraction . . . M
Mineral occurrence . . . ×

MINERAL SYMBOLS

Beryl reported	Be?	Gold reported	Au?	Silver	Ag
Chalcopyrite	Cu	Nickel	Ni	Sphalerite	Zn
Galena	Pb	Pyrite	Py	Spodumene reported	Li?
Gold	Au	Pyrrhotite	Pr	Sulphides	S

Geology by H. A. Quinn, 1953

Cartography by the Geological Cartography Division, 1954



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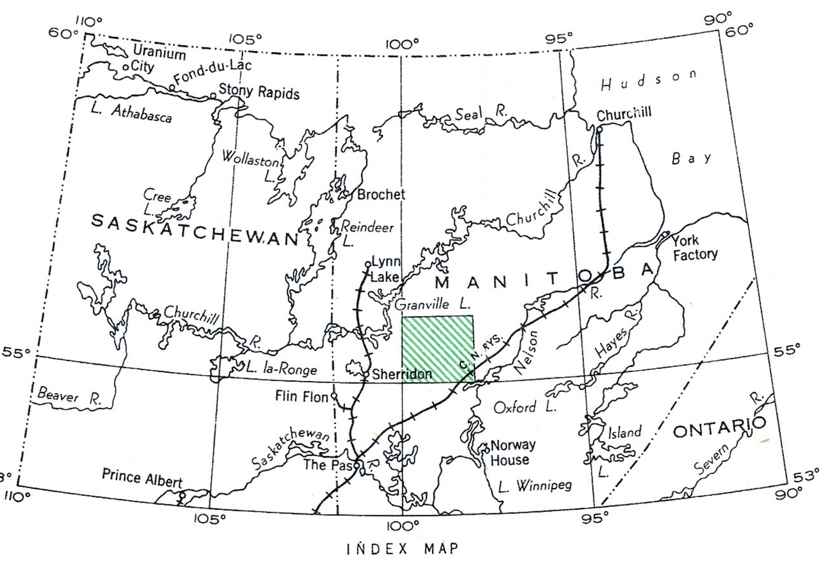

PRELIMINARY MAP 54-13

NELSON HOUSE

MANITOBA

Scale: One Inch to Four Miles = $\frac{1}{253,440}$

Miles 4 2 0 4 8 12

LEGEND

Winter road, portage . . . W.R. P.
Building
Lake and stream (position approximate)
Fall and rapid . . . F. R.
Marsh
Height in feet above mean sea-level . . . 630

Approximate magnetic declination, 13°12′ East

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

DESCRIPTIVE NOTES

Most of Nelson House map-area is underlain by granitic rocks (6), a great series of meta-sedimentary rocks (2), and by various mixtures of, and gradations between, these two main rock types (5). Volcanic rocks (3), their derived schists and gneisses (4), and sedimentary rocks (1) occur in only minor amounts. These rocks (1, 2, 3, 4, 5) are similar to, and some of them are extensions of, the complex of Kisseynew gneisses described by Harrison[1] in Kississing map-area to the west.

With minor exceptions the sedimentary (1) and volcanic rocks (3) are confined to the zone of interlacing faults that extends northeasterly from Setting Lake through Ospwagan Lake. These rocks in this zone have been named the Assean Lake group by Dawson[2]. The Setting Lake-Ospwagan Lake belt consists mainly of sedimentary rocks with lesser amounts of interbedded volcanic rocks, but in a few places the volcanic rocks predominate. Outside this belt hornblende-quartz-carbonate gneiss, hornblende-plagioclase-carbonate gneiss, and impure crystalline limestone are also included with the sedimentary rocks. Pillows, amygdules, vesicular flows tops, and flow contact breccia zones are well preserved in the volcanic rocks at Ospwagan (Pipe) Lake, Upper Ospwagan (Little Pipe) Lake, and Setting Lake. Top determinations made at Ospwagan Lake indicate that the volcanic rocks there conformably overlie most of the sediments in a syncline.

The metamorphosed equivalents (4) of the volcanic rocks are completely recrystallized and most of their primary structures have been destroyed.

The dominant rock type in the sedimentary gneisses (2) is a grey, fine-grained, garnetiferous quartz-biotite-plagioclase gneiss of remarkably uniform appearance and composition throughout the area. It is distinctly banded and commonly contains 5 to 10 per cent of light grey pegmatite and granite in sills up to several inches thick. At Paint Lake and at some points southwest of it the most common meta-sedimentary rock is a light grey, medium- to coarse-grained quartz-biotite gneiss.

The mixed gneisses (5) include various hybrid and granitized gneisses intermediate in over-all composition between the meta-sedimentary and meta-volcanic rocks and the granitic rocks. They consist mainly of paragneiss and schist containing between 25 and 75 per cent of granite and/or pegmatite. They also include rocks that have been largely replaced by granitic material. They are commonly light in colour, strongly gneissic and garnetiferous, and in many places contain appreciable amounts of cordierite and disseminated flakes of graphite.

The rocks mapped as granite (6) in most places contain many remnants of the mixed gneisses (5) and other older rocks. They are commonly gneissic, but a few small bodies are massive.

The altered basic to ultrabasic rocks (7) are almost entirely confined to the Setting Lake-Ospwagan Lake zone of faulting where all the known bodies occur in and along northeasterly trending faults. They have undergone some folding and possibly some faulting. Most of them are rather sinuous in shape, ranging from 500 to 5,000 feet long and from 50 to 1,000 feet wide. The peridotite and pyroxenite are commonly serpentinized.

Granite-pegmatite (8) is found throughout the map-area in moderate amounts. This undeformed, pink, potash-rich rock cuts all other consolidated rocks except the very few late basic dykes (9). All the known pegmatites, except those near Grass River in the southwestern part of the map-area, are simple in composition, consisting mainly of quartz, feldspar, and biotite or hornblende.

Deposits of grey clay from about 5 to 50 feet thick are seen along the banks of most streams, and this clay, in some places, overlies as much as 30 feet of glacial drift composed of sand, gravel, and boulders. Varves were noted in the clay at many points. It seems probable that the entire map-area was once occupied by glacial Lake Agassiz. Several large hills up to about 40 feet high, composed mainly of sand and gravel, are probably deltas that were formed by streams flowing westerly into Lake Agassiz. Permafrost is found in low ground in much of the map-area. At Soab Creek it is about 10 feet thick and in August its upper surface is about 2 feet deep.

All rocks older than the altered basic to ultrabasic intrusions (7) have been subjected to at least two periods of deformation, and as a result display complex folding. The dip of these strata varies from flat to vertical, commonly being about 45 degrees. Dawson[2] has cited some evidence from points outside the area suggesting that the sedimentary and volcanic rocks in the Setting Lake-Ospwagan Lake belt are younger than the enclosing rocks and overlie these unconformably. No conclusive evidence in support of this was noted.

Most faults known in the map-area trend northeasterly and occur in beds of lakes and rivers and in drift-filled depressions. The most prominent of these is the major, arc-shaped zone of thrust faulting occurring in and along the borders of the Setting Lake-Ospwagan Lake belt of volcanic and sedimentary rocks. This zone extends for at least 160 miles from Reed Lake southwest of the map-area to Assean Lake to the northeast. The Berry Creek thrust fault extends northeasterly into the southwestern part of the map-area for several miles and in places is marked by a zone of sericite schist 150 feet thick.

The main areas of economic interest are the Setting Lake-Ospwagan Lake zone of faulting and the Berry Creek fault. Much exploration for base metals has gone on along the former zone since 1947 and several hundred mining claims have been staked there. Most of this work was done by the Canadian Nickel Company Limited, and the presence of at least one substantial body of low-grade nickel-bearing material has been indicated by extensive diamond drilling. This body, at the mouth of Soab Creek, consists of abundant disseminated nickel-bearing pyrrhotite in mixed gneisses at the junction of two faults. Most of the nickel in the Setting Lake-Ospwagan Lake zone, however, occurs in disseminated pyrrhotite in deformed, sinuous bodies of serpentinized peridotite along the various faults in the zone. Minor amounts of nickel occur in sparsely disseminated grains of pentlandite. Large groups of claims are also held along this zone by Noranda Mines Limited, the Jay-Kay Syndicate, and the estate of W. M. Roberts. Although very little work has been done on the Berry Creek fault within the area, substantial amounts of copper and zinc have been found along it only 2½ miles south of the map-area.

Disseminated pyrrhotite, in places accompanied by small amounts of pyrite, chalcopyrite, sphalerite, galena, silver, and gold, is found at several scattered localities. These deposits commonly occur in bands of amphibolite in granite and mixed gneisses, but some of them are found in bands of sedimentary and meta-sedimentary rocks. No appreciable amounts of nickel have so far been detected in any of the pyrrhotite in the map-area outside the Setting Lake-Ospwagan Lake zone of faulting.

A group of twenty-seven mining claims was staked in 1939 near a tributary of Driftwood River and low values in gold are reported.

[1] Harrison, J. M.: Kississing, Sask. and Man.; Geol. Surv., Canada, Map 970A, 1949.

[2] Dawson, A. S.: Assean—Split Lakes Area; Mines Branch, Dept. Mines and Nat. Res., Manitoba, Geol. Rept. 39-1, 1941.

PRELIMINARY MAP 54-13
NELSON HOUSE
MANITOBA

SHEET 63 O