

DESCRIPTIVE NOTES

Geological studies of the Rankin Inlet area were undertaken in 1972 by the Exploration and Geological Services Unit of the Department of Indian Affairs and Northern Development. This project, to be completed by late 1974, will involve a thorough study of the 250 square-mile greenstone area north and west of Rankin Inlet.

The area, within the barren lands, is characterized by numerous lakes on relatively level tundra broken occasionally by rock ridges. Outcrops are numerous along the shore of the inlet but sparse a few miles inland. Glacial landforms including eskers and raised beaches are common within the covered areas.

Metamorphosed supracrustal rocks intruded by basic to ultrabasic sills and dykes underlie the map area. The northern and western outcrops consist of gneisses and schists derived from sediments and volcanics intruded by meliastic granite or granodiorite. Translucent white quartzite, dark to almost purplish-black quartzite, slaty tuff bands and minor greywacke form the oldest and largest part of the metasedimentary sequence (1), underlie an extensive area west of the abandoned mine shaft and outcrop on the east and west shore of the Meliadine River and south of Meliadine Lake.

The quartzitic beds are overlain conformably by 100 to 150 feet of buff-weathering siliceous dolomite (2) exposed intermittently in a narrow arc from the head of Prairie Bay to Melvin Bay and just north of the neck of a south-trending peninsula 7 miles northwest of Nipissak Lake. The dolomite is intensely brecciated and cemented with stringers of quartz and massive pyrite and pyrrhotite in the southern portion of the arc.

The two types of tuff (3) recognized within the volcanic and sedimentary sequence include a fine-grained black schistose rock containing disseminated pyrite, which weathers to a rusty to purple-red surface, and a medium to fine-grained, light grey to green unit.

North and west of Rankin Inlet the sedimentary sequence has been metamorphosed to medium- to fine-grained hornblende and biotite gneiss of granitic composition (4). The gneiss forms three one- to two-mile wide layers, separated by hornblende schist and trends east across the north-central part of the area.

Intermediate to basic flows generally altered to dark green to black greenstones make up the volcanic sequence (5). The greenstones are fine-grained with coarse-grained material occurring in the thicker parts of the flow. Pillow lavas and agglomerates are common in the southeastern part of the map area but massive flows predominate to the west. Bands of tuff are interbedded with the volcanics. To the north and west, the greenstones grade into amphibolites which in turn grade into hornblende schists.

Medium-grained, dark green hornblende schists (6) outcrop in the southeast corner of the map-area and in three one- to three-mile wide bands in the northern part of the area.

The most important rocks from the economic point of view are the ultrabasic intrusions (7). Two serpentinized ultrabasic sills were outlined during the mapping, one enclosed the ore body of the North Rankin Nickel Mines and the second outcrops along the east edge of a south-trending peninsula eight miles west of the abandoned mine shaft. These rocks weather greenish orange-brown with a deep crust. Fresh specimens are fine-grained and dark green. The ultrabasic sills are cut by zoned veins of green talc and dolomite with the talc forming the centre portion of the veins.

Basic intrusives (8) are distinguished from coarse-grained flow centres mainly on the basis of structural and contact relationships. The gabbros are medium- to coarse-grained and dark green in colour. Narrow diabase and lamprophyre dykes transect the various rock types in the vicinity of the gabbroic intrusions. A distinctive gabbroic sill intrudes the top of the sedimentary sequence and outcrops northwest and east of Nipissak Lake and south of Meliadine Lake. Sills also outcrop within the metavolcanics north of Thomson Passage and on the coast east of the peninsula eight miles west of the mine shaft.

An intrusion of medium-grained pink to grey granodiorite (9) outcrops within the northwestern part of the map-area between the Meliadine and Diana Rivers.

Rocks within the map-area have been subjected to two phases of folding along mutually perpendicular axes. The first phase resulted in a series of overturned isoclinal folds along north-east trending axes which accounts for the repetition of the supracrustal sequence in east-trending zones. Refolding along a west-northwest trending axis accounts for the curvature in the beds along the north shore of the inlet.

A small mine, operated between May 1957 and October 1962, produced 21.3 million pounds of nickel and 5.8 million pounds of copper from 405,753 tons of nickel-copper ore consisting of disseminated massive pyrrhotite, pentlandite, chalcocite, magnetite and minor pyrite within depressions on the bottom of the serpentinized ultrabasic sill at the sediment-volcanic contact.

Exploration work by various companies during the operation of the mine and in 1969 and 1970 outlined a number of minor copper-nickel showings. Each showing indicated on this map has been assigned a number which relates the showing to a description stored in a computer system and available from I.N.S.U., Ottawa.

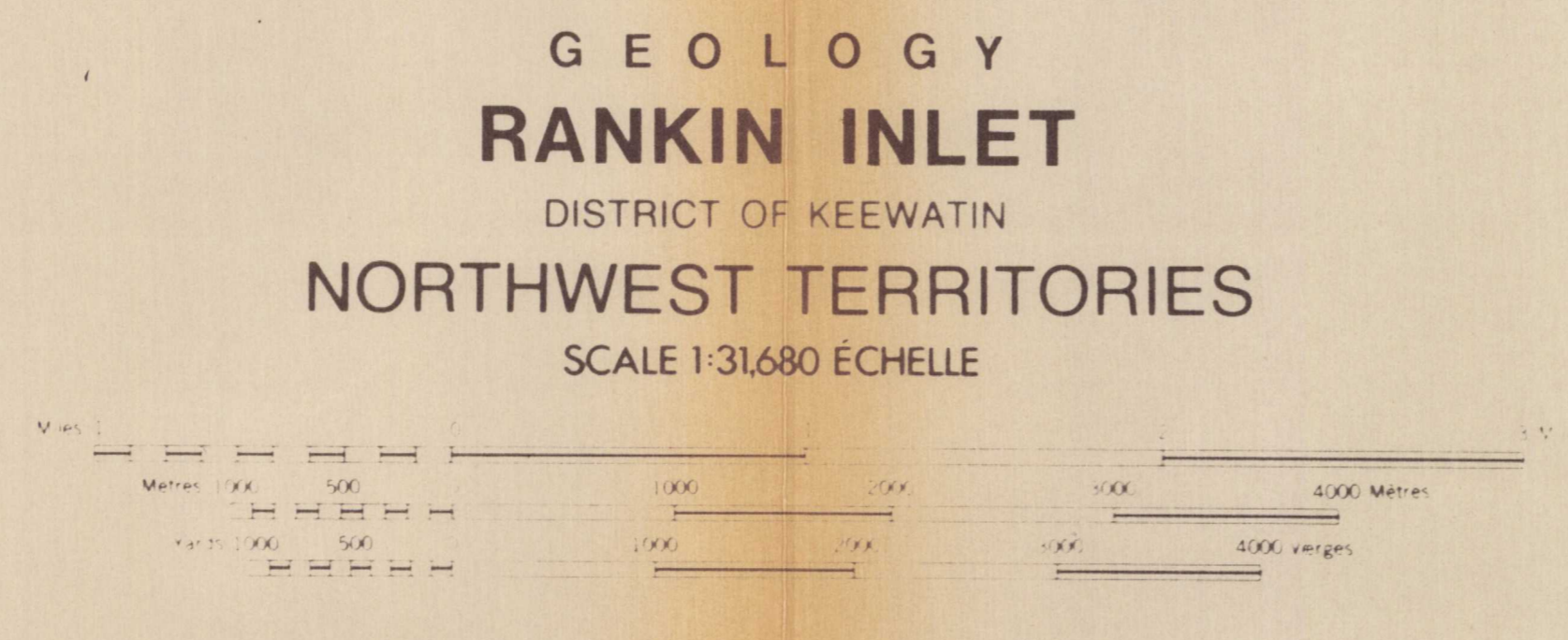
REFERENCES

Barnam, P.R., 1967. Geology of the Rankin Inlet area and North Rankin Nickel Mines, Ltd., Northwest Territories; unpub. report prepared for Surveymin Ltd.

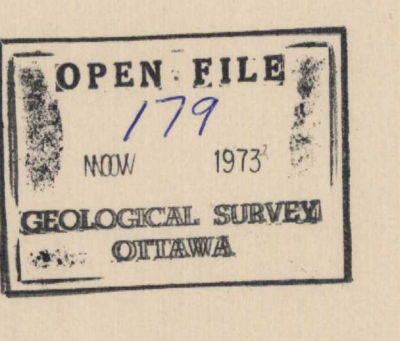
Hudson, P.P., 1969. Geology and mineral potential of Rankin Inlet, Northwest Territories; unpub. report prepared for Surveymin Ltd.

Wright, J.W., 1967. Geology of the southeastern barren grounds, part of the Districts of Mackenzie and Keewatin; Geol. Surv. Can., Memoir 350.

- LEGEND**
- Intrusive Rocks**
- 6 Granitic intrusions, massive to slightly gneissic
 - 8 Gabbroic sills and dykes
 - 7 Serpentinized ultrabasic intrusions
- Metamorphosed Volcanic Rocks**
- 5 Hornblende schist derived from (5), includes amphibolite
 - 3 Intermediate to basic metavolcanic rocks: 5a, massive lava; 5b, coarse-grained centres of flows; 5c, pillow lavas, agglomerate and tuff interbeds; 5d, mixed, pillowed and massive lava; 5e, amphibolite
- Metamorphosed Sedimentary Rocks**
- 4 Hornblende gneiss and biotite schist derived from (1) and (3)
 - 3 Intermediate to basic tuff
 - 2 Dolomite; siliceous dolomite
 - 1 Mainly orthoquartzite, tuff and greywacke



- SYMBOLS**
- Limit of outcrop
 - Geological contact (defined, assumed)
 - Metamorphic contact (defined, assumed)
 - Bedding (inclined, dip unknown)
 - Schistosity, gneissic structure (inclined, dip unknown)
 - Fault (defined, assumed)
 - Shaft, abandoned
 - Exploration diamond drill hole
 - Mineral prospect or occurrence
- Mineral Symbols**
- Copper Cu
 - Nickel Ni
 - Pyrite Py
 - Pyrrhotite po



Geology by S.V. Fane and P.J. Laporte, 1972
 Geological compilation by P.J. Laporte, 1973