Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

Geological Survey of Canada
Commission géologique du Canada

DESCRIPTIVE NOTES

Gods River map area in northeastern Manitoba comprises two physiographic regions. The Hudson Bay Lowlands in the northeast occupy approximately 25% of the study area while the remaining 75% is part of the Canadian Shield.

Ground elevations range from approximately 200 m a.s.l. in the southwest of the study area to 100 m a.s.l. on Gods River near Shamattawa in the northeast. Organic deposits are common and drainage is generally poor. Most of the region drains north into Hudson Bay via Hayes and Gods rivers.

Shamattawa, the only community in the area, is situated at the junction of Gods and Echoing rivers. Access to Shamattawa is possible by air year-round and by winter road during the winter months.

Bedrock outcrops are few as much of the area is covered by thick glacial and postglacial deposits. The few outcrops present have weathered surfaces that prohibit identification of striations. Within the Canadian Shield physiographic region, Precambrian granites and granodiorites of the Superior Province dominate. East-west trending belts of other Precambrian rocks, including the ultramafic rocks of the Fox River Belt, are also found throughout this part of the Shield. In the northeast section of the study area, the Precambrian rocks are overlain by carbonate-rich Paleozoic rocks of the Hudson Bay Lowlands. In this part of the Lowlands, these rocks comprise Ordovician and Silurian limestone and dolomite. A map providing a more detailed description of bedrock has been published by the Manitoba Mineral Resources Division (1979).

Surface exposures of till are not abundant and occur mostly in the form of drumlins. The tills of the drumlins are generally clay-rich, contain carbonate pebbles, and are light brown. In the north-central and southwest parts of the study area, the drumlinoid features are veneered by fine grained, waterlain sediments and have been flattened by wave action. In the northwest, however, tops of the drumlins are commonly free of waterlain silt and clay and in places strandlines encircle their perimeters. In the extreme northeast corner of the map area a zone of till occurs which is part of a much larger upland region extending beyond the boundaries of the map. This till area also exhibits marine beaches around its perimeter and has been interpreted as a former island in the postglacial Tyrrell Sea (Manitoba Mineral Resources Division, 1981).

Ice contact sediments include the northern end of the Sachigo Interlobate Moraine situated to the east of Red Cross Lake. This moraine extends 240 km south to Sandy Lake in northwestern Ontario where it bends west towards the Hudwin Moraine in Manitoba. The original height of the moraine has been reduced by extensive wave action during inundation by glacial Lake Agassiz. In the map area, the maximum height of the moraine is only about 3 m above the adjacent glaciolacustrine plain while the width averages approximately 1.5 km. Both the height and width of the moraine are greater to the south of the study area.

Several esker systems occur in this area, the most extensive of which is in Hayes River valley. This system consists of a series of esker ridges which have undergone modification during inundation by glacial Lake Agassiz. The outwash sediments related to these eskers have a variable lateral extent which reaches a maximum of 5 km. Brassey Hill, a kame situated on this esker system, rises to 30 m above the surrounding land and represents the highest relief and most visible landmark in this typically flat area.

At maximum inundation, Tyrrell Sea encroached on the eastern and northern parts of the map area. Marine beaches are located at about 150 m a.s.l. but the exact position of marine limit above this level is difficult to establish since the local marine sediments are commonly indistinguishable from the lacustrine silt and clay which dominate the rest of the map area. The contact between marine and lacustrine clays shown on the map is based primarily on beach location, extent of organic cover, and topography interpreted from aerial photographs. Detailed field investigations of the local clays were conducted on stream-cut sections at the junction of Gods and Red Sucker rivers, on Gods River north of Shamattawa, and on an unnamed stream west of Shamattawa. In all cases, two colour distinct units of fine grained, deep basinal deposits with combined thickness in the 2 m range were identified. It is possible that the lower of these two units is of lacustrine origin, and the upper unit of marine origin. Analysis of microfossils from these units and from clays sampled in the region agrees with both the stratigraphic interpretation and the photographically interpreted marine limit. More than 60% of the samples collected, however, did not contain microfossils and the evidence must be considered inconclusive.

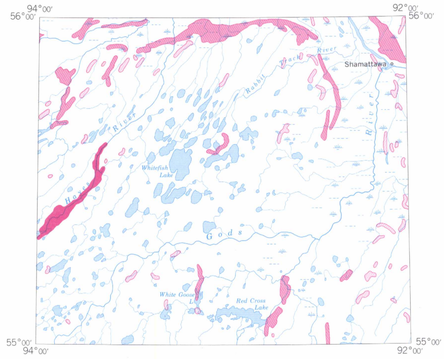
Deposits of alluvium are common along the major rivers. Sand, silty sand, and rounded gravels have been deposited in the form of terraces and minor floodplains particularly along Gods and Fox rivers. At least three levels of river terraces are identifiable along Fox River in the northwest part of the map area.

The economic potential for aggregate resources is considerable in this area. Several deposits of ice contact material and coarse grained nearshore sediments are available but poor road access prevents their extraction. Construction activity is taking place to the north of the study area on the Nelson River hydro-electric projects but, to date, local aggregate resources have met the project requirements. The Gods River area, therefore, will continue to meet the limited needs of the community of Shamattawa and remains as a region of high economic potential for consideration in the future.

REFERENCES

Manitoba Mineral Resources Division
1979: Geological map of Manitoba; Manitoba Department of Energy and Mines, Map 79-2, scale 1:1 000 000

1981: Surficial geological map of Manitoba; Manitoba Department of Energy and Mines, Map 81-1, scale 1:1 000 000



POTENTIAL AGGREGATE RESOURCES

SAND AND GRAVEL DEPOSITS

High potential for economic feasibility: large volume of ice contact and esker deposits. Ideally, gravel content is greater than 35%, oversize gravel (>10 cm diameter) content is less than 20%, and lithological deficiencies (i.e., chert, shale, mica, etc.) are kept to a minimum

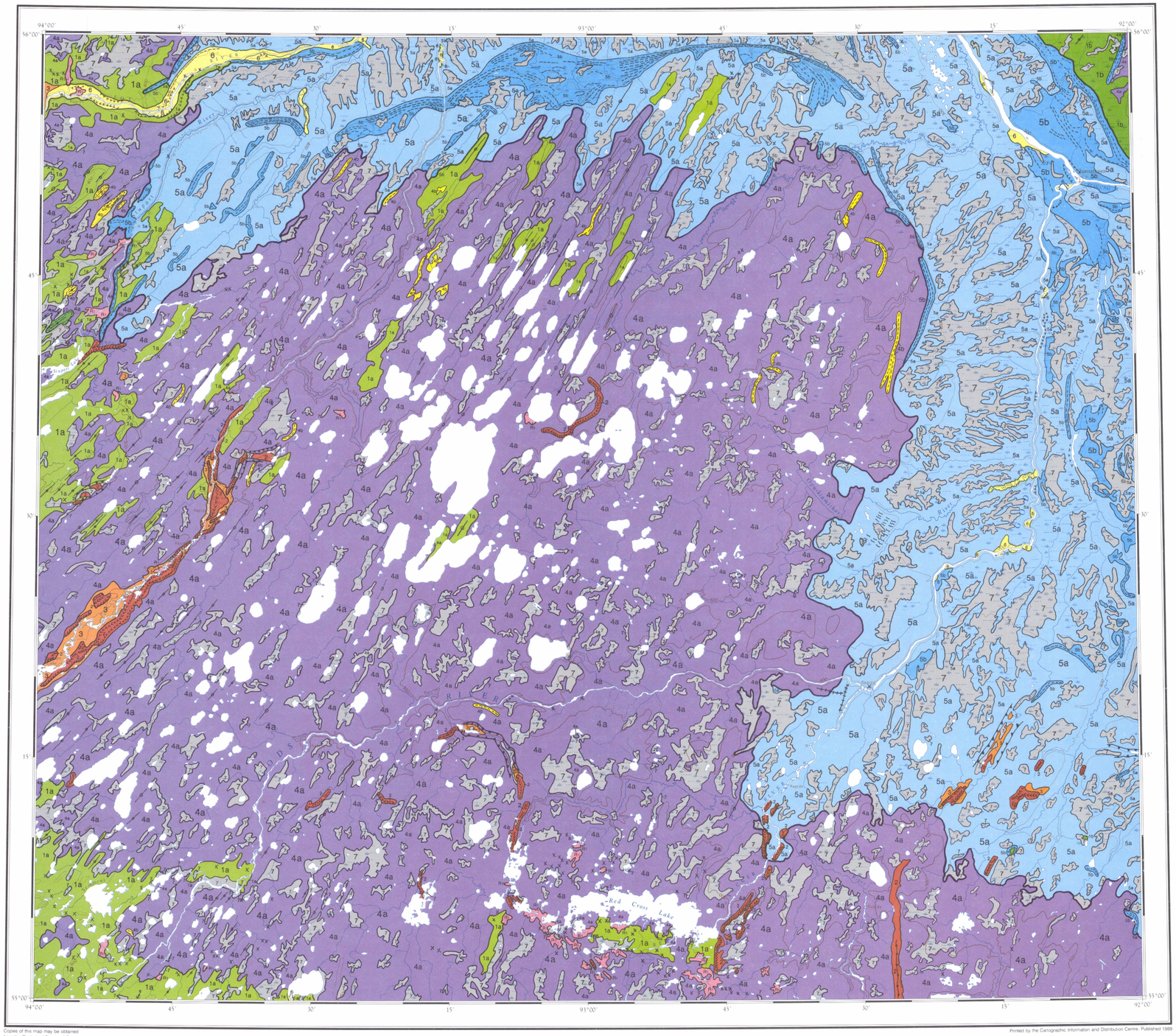
Medium potential for economic feasibility: small volume of ice contact and esker deposits and large volume of nearshore lacustrine and nearshore marine deposits. Deposit lacks either in volume or in quality of aggregate to be considered of high potential

Low potential for economic feasibility: small volume of nearshore lacustrine or nearshore marine deposits and very small volume of ice contact and esker deposits

Contribution to Canada-Manitoba Mineral Development Agreement 1984-89, a subsidiary agreement under the Economic and Regional Development Agreement. Project funded by the Geological Survey of Canada

Manitoba
Energy and Mines

Canada



Copies of this map may be obtained from the Geological Survey of Canada
601 Booth Street, Ottawa, Ontario K1A 0E8
3303-33rd Street, N.W., Calgary, Alberta T2L 2A7

MAP 1684A

SURFICIAL GEOLOGY

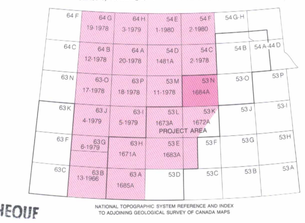
GODS RIVER

MANITOBA

Scale 1:250 000 - Échelle 1/250 000

Kilometres 5 0 5 10 15 20 Kilomètres

Universal Transverse Mercator Projection
Projection transverse universelle de Mercator



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO ADJOINING GEOLOGICAL SURVEY OF CANADA MAPS

LEGEND

Coloured legend blocks indicate map units that appear on this map

SURFICIAL DEPOSITS
QUATERNARY

HOLOCENE

NONGLACIAL ENVIRONMENT

8 — *LACUSTRINE DEPOSITS: sand, muddy sand and pebbly sand; up to 2 m thick; occurs as sloping or gently undulating plain; nearshore sediments associated with modern lakes*

7 — *ORGANIC DEPOSITS: lichen-moss, sedge, and woody peat; 1.5 to 3 m thick; may occur at or up to 3 m above the water table; includes both bog peat and fen peat. Peat mantles most geological features*

6 — *ALLUVIAL DEPOSITS: silt, sand and rounded gravel, commonly terraced; thicknesses range from a thin veneer up to 30 m; deposited by streams within active drainage systems since the retreat of the sea, proglacial lakes, or glacial ice as floodplains, spits, point bars, and deltas*

NONGLACIAL AND GLACIAL ENVIRONMENT

MARINE/GLACIOMARINE DEPOSITS: well sorted, stratified sand to stony silt deposited in Tyrrell Sea, and glacial deposits modified by marine processes during offlap; commonly overlain by peat

5b — *Nearshore sediments: well sorted silt, sand, and gravel; up to 3 m thick; occurs as a series of ridges in the form of beaches, bars, spits, and ice-pushed ridges, or as a flat plain*

5a — *Offshore sediments: poorly sorted clayey silt, stony silt, and sand with pockets of nearshore sand and gravel and windblown sand; probably a till plain levelled by filling of depressions and planation by wave action; thicknesses of up to 2 m near marine limit and increasing towards Hudson Bay to a maximum of 7 m; may contain marine fossils and is commonly overlain by organic materials*

LACUSTRINE/GLACIOLACUSTRINE DEPOSITS: massive to bedded silt-clay with granules, overlain by a veneer of sand. Deposited in glacial Lake Agassiz; where deposits are thin, they mirror the underlying glacial and bedrock structures, and where thick, they form a flat plain

4d — *Littoral sediments: blanket of sand grading basinward into undifferentiated silt and clay*

4c — *Nearshore sediment veneer: well sorted sand and gravel; occurs as a ridge or series of ridges with 1 to 4 m of relief on wave washed glaciofluvial deposits pre-dating glacial Lake Agassiz*

4b — *Nearshore sediments: well sorted sand and gravel; occurs as a ridge or series of ridges with 1 to 4 m of relief; includes beaches, bars, spits, and ice-pushed ridges*

4a — *Offshore sediments: well sorted clay, silt, and sand; thickness ranges from a thin veneer up to 20 m; surface characterized by iceberg scours and extensive areas of peat*

LATE PLEISTOCENE

GLACIAL ENVIRONMENT

GLACIOFLUVIAL DEPOSITS: water sorted, stratified sand and gravelly sand deposited in, around, or near a glacier, largely as a result of meltwater flow

3 — *Outwash sediments: well rounded, cross-stratified sands and gravels, 3 to 20 m thick, characterized by braided channels and kettle depressions; occurs along the flanks of eskers or in the bottom of subglacial and proglacial meltwater channels; surfaces are commonly terraced and hummocky*

2 — *Ice contact stratified drift: well sorted, poorly stratified sand and gravel kame deposits, 10 to 30 m high, stratified sand and minor gravel esker deposits, 5 to 20 m high, and recessional, end, or interlobate moraines. Kames occur as irregular mounds flanking eskers. Eskers occur as elongate ridges, generally parallel to the direction of ice movement*

GLACIAL DEPOSITS (TILL): poorly sorted debris deposited at the front of or beneath glaciers or under ice shelves. The tills of the western side of the province are sandy to silty sand and have a high percentage of clasts derived from granitic terrain; the tills of the eastern side are generally silty and highly calcareous

1b — *Till blanket: silty to sandy, 1 to 10 m thick; masks most of the bedrock features; surface features include drumlins, fluting, ribbed moraine, and hummocks*

1a — *Till veneer: sandy, usually less than 1 m thick, interspersed with areas of thicker till, bedrock, marine or lacustrine sediments. Surface reflects the underlying bedrock structure*

BEDROCK
PRE-QUATERNARY

R_2 — *Paleozoic rock: sedimentary carbonate rocks; dolomitic limestone and dolomite*

R_1 — *Precambrian rock: largely massive granitic and gneissic rock with isolated bands of volcanic rock*

Geological boundary
Small bedrock outcrop
Drumlin
Fluting
Crag and tail (direction of ice flow known)
Recessional, lateral, or end moraine ridge
Ribbed moraine
Esker (direction of flow known, unknown)
Meltwater channel (large, small)
Beach ridge
Trimline or terrace slope break
Tyrrell sea limit

Geology by M.D. Clarke, 1986

Thematic information on this map is reproduced directly from author's copy

Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Base map at 1:250 000 published by the Surveys and Mapping Branch in 1965. Base map at 1:1 000 000 published by the Surveys and Mapping Branch in 1970

Copies of the topographical edition of this map may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa, Ontario, K1A 0E9

Mean magnetic declination 1988, 00°57' East, decreasing 9.2' annually. Readings vary from 00°18'W in the SE corner to 02°14'E in the NW corner of the map

Elevations in feet above mean sea level

Printed by the Cartographic Information and Distribution Centre. Published 1989

Recommended citation:
Clarke, M.D.
1989: Surficial geology, Gods River, Manitoba; Geological Survey of Canada, Map 1684A, scale 1:250 000