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

Geological Survey of Canada
Commission géologique du Canada

DESCRIPTIVE NOTES

The Norway House, Manitoba map area is characterized by extensive organic deposits. There is little topographical relief and the region slopes gently from maximum elevations of 300 m a.s.l. at the eastern edge of the map to 230 m a.s.l. at Lake Winnipeg. Drainage is into Lake Winnipeg.

The study area lies within the Superior Province of the Canadian Shield and all outcrops consist of granitic or gneissic rock with the exception of one belt of volcanic rock, predominantly basalt and andesite, extending from Stevenson Lake, through Ponask Lake, to east of Lebrix Lake. The volcanic belt continues to the east of Stevenson Lake beyond the border of the study area.

The absence of an adequate road network in the dense boreal forest and extensive peat bogs caused a problem with access and mobility for field work. It was possible, however, to visit 25 sites which were preselected primarily to aid in mapping the extent of the morainic systems.

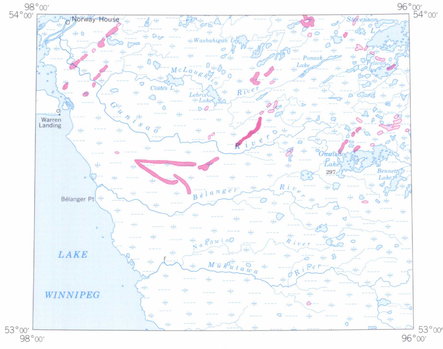
The area is blanketed by extensive, thick, clay deposits and no till was identified at the surface during field checking. Sections are scarce in the area and, in all cases, hand dug pits were relied upon to study the sediments. At many of the sites chosen for field checking the organic deposits were too thick to allow investigations of the underlying sediments, particularly in the western half of the map area.

The study area contains a number of end and interlobate moraines. Ground checking of these features revealed predominantly sand and silt sediments with subrounded to subangular cobbles and pebbles. Wave action has modified the features and a veneer of coarse grained beach sediments has been deposited on them. The end and interlobate moraines are usually of low relief, although in some places they stand as much as 20 m above the adjacent terrain; they can be detected on aerial photographs by tonal changes of the vegetation. The morainic systems represent three temporary halts in ice retreat and each can be correlated with morainic systems in the adjacent Island Lake map area to the east. They are, from south to north: the Hudwin Moraine, the Cantin Lake Moraine, and the Bigstone Lake Moraine (Nielsen, 1980).

In the west-central part of the map area there is a large, raised sand spit whose apex is about 17 km east of Lake Winnipeg. The spit is elevated about 3 m above the surrounding area. The northern arm of the feature has formed as a straight line for a distance of approximately 6 km. At the eastern end of this arm of the spit, the coarse grained beach deposits merge with a large, wave-washed esker. The two units are of similar lithology and appearance on aerial photographs, so orientation of the features and clast size of the sediments sampled at a limited number of sites was relied upon to distinguish between them.

Engineering problems in this clay- and organic-covered terrain are considerable and, although the extensive ice contact deposits in the area are a good aggregate resource, poor access prevents them from being utilized at the present time.

Nielsen, E.
1980: Quaternary geology and gravel resources of the Island Lake-Red Sucker Lake area; Manitoba Mineral Resources Division, Geological Report GR80-3



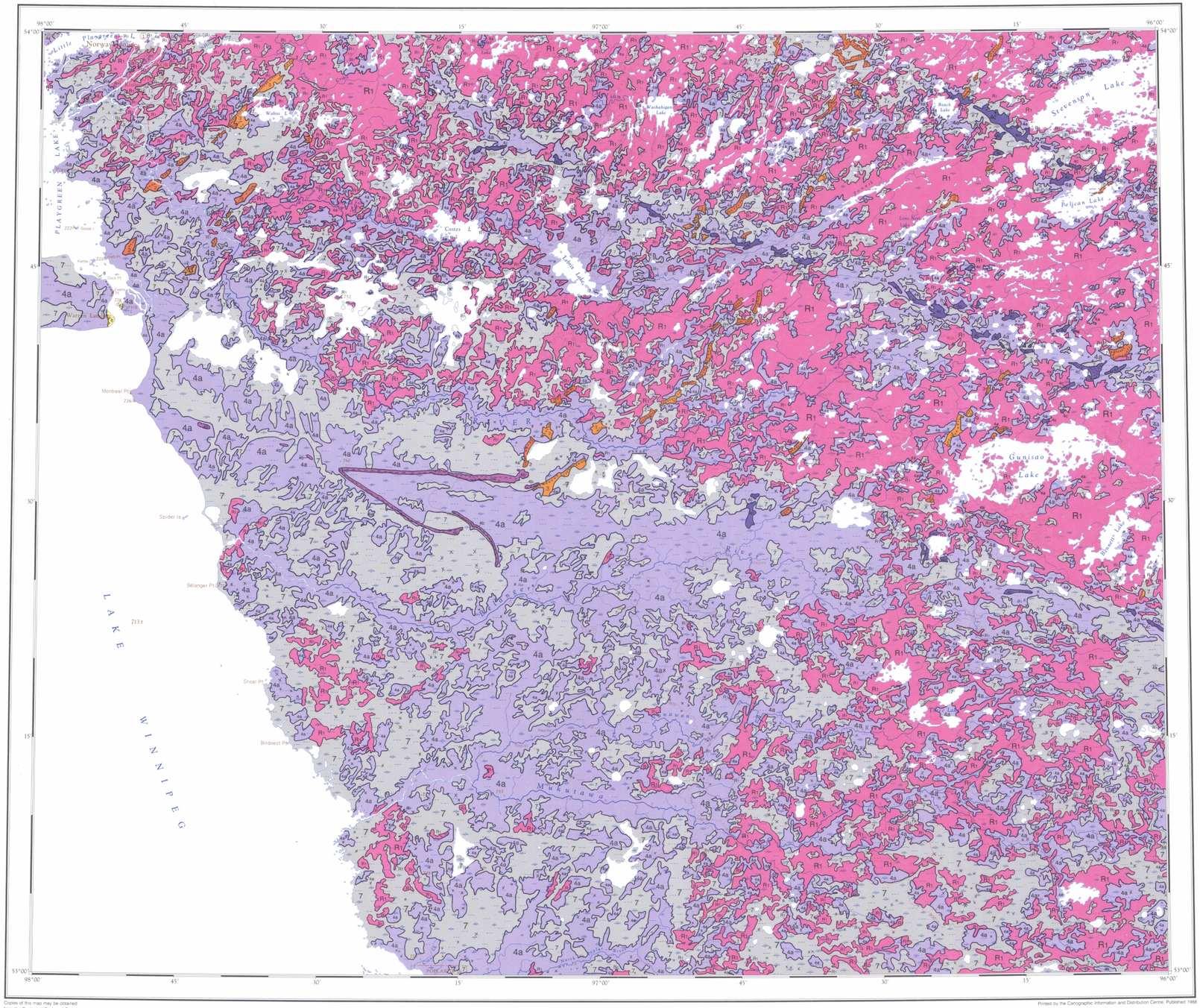
POTENTIAL AGGREGATE RESOURCES

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



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

INDEX MAP

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

MAP 1671A

SURFICIAL GEOLOGY

NORWAY HOUSE

MANITOBA

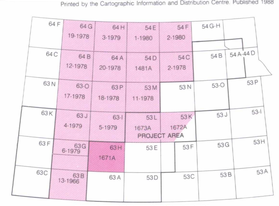
Scale 1:250 000 - Échelle 1/250 000

Kilometres 5 0 5 10 15 20 Kilometres

Universal Transverse Mercator Projection

Projection transverse universelle de Mercator

Printed by the Cartographic Information and Distribution Centre. Published 1988



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

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*

FLUVIAL DEPOSITS: material deposited by streams within active drainage systems since the retreat of the sea, proglacial lakes, or glacial ice

6 — *Alluvial sediments: silt, sand, and rounded gravel, commonly terraced; thicknesses range from a thin veneer up to 30 m; deposited by running water as floodplains, spits, point bars, and islands; this unit contains minor deltaic sediments*

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

5c — *Deltaic sediments: sand, pebbly sand, and gravel deposited in Tyrrell Sea by glacial or nonglacial streams*

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: nearshore 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 m 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
Crag and tail (direction of ice flow known)
Esker (direction of flow known, unknown)
Beach ridge
Trimline or terrace slope break

Geology by M.D. Clarke, 1985, 1986, based mainly on airphoto interpretation with limited ground checking

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 the same scale published by Surveys and Mapping Branch in 1965

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, 05°51' East, decreasing 19.1' annually. Readings vary from 07°03' E in the SW corner to 04°35' E in the NE corner of the map

Elevations in feet above mean sea level

Recommended citation:
Clarke, M.D.
1988: Surficial geology, **Norway House, Manitoba;**
Geological Survey of Canada, Map 1671A, scale 1:250 000