HUDSON BAY
LAKE WINNIPEG
LEGEND
QUATERNARY
NONGLACIAL ENVIRONMENT
A
ALLUVIAL DEPOSITS: gravel, sand, and silt, 1-10 m thick; occurs as terraces and plains that were formerly stream floodplains and deltas; occurs mainly adjacent to Nelson and Hayes rivers in the Hudson Bay Lowland
PROGLACIAL AND NONGLACIAL ENVIRONMENTS
MARINE/GLACIOMARINE DEPOSITS: sand and gravel, silt and clay, deposited in Tyrrell Sea; fossiliferous in part; surface flat, with exception of beach ridges; deposits largely buried by organic sediments up to 3 m thick
Wr
MARINE SHORELINE DEPOSITS: sand and gravel, 1-3 m thick; occurs as beaches and bars derived largely from underlying till and glaciofluvial materials
W
MARINE NEARSHORE AND INTERTIDAL DEPOSITS: silt, sand, and clay, 1-3 m thick; generally occurs as an upward coarsening offlap sequence; commonly overlies till but locally overlies lacustrine sediments
GLACIOLACUSTRINE DEPOSITS: clay, silt, sand, and gravel deposited in glacial Lake Agassiz; fine grained sediments occurring as either a continuous blanket or a patchy veneer; coarser facies occurring as bars, spits, and flights of beaches
L
GLACIOLACUSTRINE BASIN DEPOSITS: clay and silt, 2-15 m thick; commonly grey and varved where thick but massive and brownish near surface and where thin; forms a nearly unbroken blanket in low relief areas or occupies basins between bedrock hills
HOLOCENE
LM LR
LM: discontinuous veneer, 1-2 m thick; largely overlying till and including areas of till and rock
LR: discontinuous veneer, 1-2 m thick; largely overlying rock and including abundant rock outcrops
Lr
GLACIOLACUSTRINE SHORELINE DEPOSITS: sand, gravel, and rock rubble, up to 3 m thick; occurs as beach ridges, bars, spits, and flights of beaches; largest deposits are developed on and adjacent to glaciofluvial sediments; extensive but thin rubble beach deposits occur on carbonate bedrock north and west of Lake Winnipeg
GLACIAL AND PROGLACIAL ENVIRONMENTS
GLACIOFLUVIAL DEPOSITS: sand and gravel, up to 90 m thick, deposited as ice contact stratified drift or as proglacial outwash
G
GLACIOFLUVIAL ICE CONTACT DEPOSITS: sand and gravel with variable sorting and stratification; locally contains or is overlain by gravelly diamicton; 15-90 m thick; occurs mainly as major kame moraine systems consisting of broad kettled ridges formed as interlobate moraines and as isolated kames and eskers; surface of features in many areas reworked by lacustrine processes and locally overlain by beach ridges
Gt
GLACIOFLUVIAL CHANNEL DEPOSITS: sand and gravel, well sorted and well stratified; 1-15 m thick; occurs as plains and terraces within or adjacent to large valleys in which proglacial outwash was deposited
MORAINAL DEPOSITS: dominantly sandy and silty till deposited at the margin of or beneath glaciers and floating ice shelves; texture and composition variable; tills of northern provenance are sandy, stony, and slighty calcareous; those of eastern provenance and in areas underlain by carbonate bedrock are less stony, somewhat less sandy, and are calcareous
LATE WISCONSINAN
M
GROUND MORAINE: sandy and silty till, 1-8 m thick; occurs as a blanket with a nearly flat to gently undulating surface with up to 8 m of local relief; in places overlain by a veneer of clay, silt, sand, and gravel of mainly glaciolacustrine origin
Mv
Mv: till and minor clay, silt, sand, and gravel, up to 2 m thick; occurs as a discontinuous veneer over rock with abundant rock outcrops
Mh
HUMMOCKY MORAINE: till, 5-30 m thick; occurs as ridges, knolls, hummocks, and intervening depressions with local relief up to 30 m; includes and is associated with glaciofluvial ice contact deposits in many areas
PRE-QUATERNARY
ROCK: outcrop and rock thinly covered by drift
Rc R
DOLOMITE, CALCAREOUS SHALE, AND LIMESTONE: flat-lying, bedded carbonates and rock rubble with patches of thin till and stratified sediments; nearly flat to gently rolling terrain
IGNEOUS AND CRYSTALLINE METAMORPHIC ROCK: hilly, knob and lake topography; ridges, lakes, and valleys controlled by bedrock structure and stratigraphy; stratified sediments and till occur in local basins and are present as a thin patchy veneer on some slopes (typical Precambrian Shield terrain)
NOTE: organic deposits, commonly 1-3 m thick, cover the surficial deposits and bedrock in most low-lying, poorly drained parts of the region
Geological boundary
Drumlin or drumlinoid (ice flow direction known, unknown)
Striae (ice flow direction known, unknown)
Moraine ridge
Esker (direction of flow assumed, uncertain)
Abandoned or underfit channel (large, small)
Minor intersecting lineaments or grooves
Beach
Escarpment or steep bank
Partly filled valley (large, small)
Limit of forebay flooding
Geology by R.W. Klassen and J.A. Netterville, 1971-1973
To accompany Memoir 419 by R.W. Klassen and J.A. Netterville
Geological Cartography by P.P. Hermann, Geological Survey of Canada
Any revisions or additional geological information known to user would be welcomed by the Geological Survey of Canada
Base map assembled by the Geological Survey of Canada from maps published at the same scale by Surveys and Mapping Branch 1974, 1977, 1979
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MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES
MAP 1603A
SURFICIAL GEOLOGY
NORTH-CENTRAL MANITOBA
Scale 1:500 000
Kilometres 10 0 10 20 30 40 Kilometres
Transverse Mercator Projection, CM 96°, Scale Factor 0.9994
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MAP 1603A
NORTH-CENTRAL MANITOBA