



LEGEND

PALEOZOIC ROCK AQUIFERS PA
MESOZOIC ROCK AQUIFERS J
JURASSIC ROCK AQUIFERS J
CRETACEOUS ROCK AQUIFERS KSR
WELL LOG INDICATING A QUATERNARY AQUIFER •

DISCUSSION

Bedrock aquifers found within the map sheet area are presented on this map in a time-stratigraphic framework. Quaternary aquifers, predominantly sand and gravel bodies, have been shown where indicated by well logs.

PALEOZOIC ROCK AQUIFERS

Paleozoic rocks in the map sheet area comprise a series of carbonate rock aquifers of Ordovician through Devonian age separated by argillaceous aquicludes. The entire rock sequence is referred to as the Carbonate Aquifer System in Manitoba. This aquifer system forms the bedrock east and north-east of Dauphin Lake while south and west of Dauphin Lake this aquifer system is overlain by Jurassic and Cretaceous sediments.

Well yields from these aquifers are highly variable spatially as is typical for fractured rock aquifers. Yields depend primarily on the number of fractures intersected and fracture aperture and interconnection. Reported or calculated well yields from pumping test data range from more than 35 L/s to less than 0.3 L/s. Yields can frequently be improved by deepening the well since fractures have been found generally to occur throughout the aquifer system.

East of Lake Manitoba and the Waterhen River water is generally fresh in these aquifers although poor quality water may be encountered in the Gypsumville area. Groundwaters are generally brackish (TDS 2,000 to 10,000 mg/L) to saline (TDS 10,000 to 100,000 mg/L) in areas west of Lake Manitoba and the Waterhen River. However water quality in this region is highly variable and local areas of fresh water do occur. In this area water quality can be expected to deteriorate rapidly with increased depth of penetration of the aquifer system.

MESOZOIC ROCK AQUIFERS

The primary Mesozoic aquifers found in the map sheet area include sandstones and carbonate rocks in Jurassic formations and sandstones in the Swan River Formation of Cretaceous age.

Jurassic rock aquifers are found south, west and northwest of Dauphin Lake with minor occurrences immediately east of the Lake. In the far south-western corner of the map sheet area Jurassic rocks are overlain by Cretaceous sediments.

Little information is available on well yield from Jurassic aquifers within the Dauphin Lake map sheet area. However, test drilling within the Neepawa map sheet area to the south indicates yields ranging from less than 0.2 L/s to more than 1.6 L/s. The higher well yields were generally from sandstone aquifers.

Water quality in Jurassic aquifers is generally brackish to saline within the Dauphin Lake map sheet area although groundwaters may be fresh along the eastern outcrop belt.

The Swan River Formation is found south and south-west of Dauphin Lake and is overlain by Cretaceous shales in the far south-western corner of the map sheet area. Sandstones of varying thickness and grain size distribution are found locally in this predominantly shaly formation.

Well yields from the Swan River formation sandstones vary from less than 0.1 L/s to more than 2 L/s depending on the thickness, grain size and degree of sorting of the sandstone.

Water quality varies from fresh (TDS less than 2000 mg/L) to saline with water quality generally deteriorating towards the south-west.

QUATERNARY SEDIMENT AQUIFERS

Quaternary aquifers consist primarily of sand and gravel bodies laid down during Pleistocene glaciation. These aquifers are found throughout the map sheet area, generally occurring at the bedrock-overburden contact as or inter-till deposits.

Well yields from these aquifers are variable depending on the thickness, extent, degree of sorting and grain size of the aquifers encountered. An extensive inter-till sand and gravel aquifer has been identified southwest of Dauphin Lake. Wells yielding as much as 75 L/s may be developed.

Groundwaters are generally fresh in sand and gravel aquifers east of Lake Manitoba but vary from fresh to saline west of the Lake where quality generally deteriorates with depth.

USE OF MAP

The presence of bedrock aquifers within the map sheet area has been indicated using the bedrock formation symbols presented on the accompanying bedrock geology map with the exception being the symbol PA, which is used to indicate the Paleozoic Carbonate Aquifer System comprising Ordovician, Silurian and Devonian sediments. The minor area of Permian and Precambrian rocks near Gypsumville has been included within this aquifer unit. Due to variability of water quality within bedrock aquifer units, the boundaries for these units have been drawn strictly on the basis of geological occurrence. The user is reminded that water quality tends to deteriorate with depth and westward extent in these units west of Dauphin Lake. Users are encouraged to refer to the water quality map of accompanying this report when evaluating the suitability of these aquifers for development.

Sand and gravel aquifers occur throughout the map sheet area. The areal extent and continuity of individual sand and gravel bodies has rarely been evaluated. Therefore, rather than attempt to outline the various aquifers, wells and test holes which have intersected a significant thickness of sand and gravel have been indicated individually on the map. The user can, in conjunction with the cross-sections also presented in this report, evaluate the likelihood of occurrence of sand and gravel aquifers in any particular area.

Again the occurrence of sand and gravel aquifers is indicated on the basis of geologic occurrence only. No consideration has been given to water quality. The user is encouraged to refer to the accompanying water quality map to evaluate the likely water quality within any given sand and gravel aquifer or portion of an aquifer.

Reference:
Little, J., 1973, Ground-water Availability in the ochre River—St. Rose Area. Ground-water Availability Studies Report No. 7, Manitoba Water Resources Branch.
Little, J., 1973, Ground-water Availability in the Dauphin Area. Ground-water Availability Studies Report No. 9, Manitoba Water Resources Branch.

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