

GEOLOGY OF KOTA KINABALU AND ITS IMPLICATIONS TO GROUNDWATER POTENTIAL

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The increasing population in Kota Kinabalu results in an increase in the demand for water supply. Groundwater is of primary concern because it is the most economical source of water supply. The main objectives of this paper are 1) to evaluate the groundwater resources in the study area and 2) to study effect of geology on groundwater. Kota Kinabalu is underlain by the Middle Oligocene-Lower Miocene Crocker Formation which is composed of sandstone, shale and an interlayered sandstone and shale, and Quaternary alluvium. The study area is controlled by heavy structural lineaments mainly representing major folds, thrust faults, normal faults, wrench faults, sheared zones and landslides. A common characteristic of these structures is that they are closely associated with each other. Movement along these structures strongly influenced the geomorphology and groundwater of the study area. The rock formation within the fault zone and its vicinities are highly deformed, sheared and controlled by heavy joints and fractures resulting from thrusting. Geological study of the area indicates that only the sandstone unit of the Middle-Oligocene-Low Miocene Crocker Formation and the Quaternary alluvium can be considered as important groundwater reservoirs. The aquifers within the study area can be divided into three major groups based on the host rock and structural parameters as following: 1) aquifers of Quaternary alluvium, 2) aquifers within the fault zone and 3) aquifers of the sandstone unit of the Crocker Formation. Chemical and physical analysis of groundwater indicate that the groundwater in this study area is of meteoric origin and is alkaline in nature.

Both the stratigraphic and structural settings facilitates favorable movement and circulation of groundwater within the Crocker Formation and Quaternary alluvium. It affects the continuity of the aquifers, enhances secondary permeability, as well as increases the storage capacity of the formation. Such settings also create confined and unconfined aquifer systems.

By and large, the Crocker Formation and Quaternary alluvium has a good potential for resource and development of groundwater in Kota Kinabalu.
