Geophysical application for groundwater potential and water quality analysis of Melangkap area, Kota Belud, Sabah

ABSTRACT

The study area is located at Melangkap area of Kota Belud, Sabah, Malaysia which comprises of Crocker Formation aged Late Eocene to Early Miocene and Quaternary alluvium deposits. This study focuses on groundwater potential using electrical resistivity method and water quality analysis of the study area. Schlumberger array using ABEM Terrameter LS instrument and Res2DINC software is used for data acquisition. Three survey lines were conducted in Kg. Melangkap, Kg. Kebayau dan Kg. Tambatuon. Water samples from existing boreholes from these locations were analysed based on Drinking Water Standard by Malaysian Department of Environment. Subsurface interpretation showed the layer of shale with resistivity value of 20 - 40 ohm-m, fractured sandstone with 20 -175 ohm-m, interbedding of shale and sandstones with 60 – 500 ohm-m, saturated sandstones with 40 – 1000 ohm-m, thick sandstones with 500 – 1000 ohm-m and gravel deposits with 175 - 1000 ohm-m. Each survey line showed 3 zones of different materials. Kg Kebayau shows the best potential for groundwater supply than Kg Melangkap and Kg Tambatuon, due to existence of 12 m thickness of sandstone aquifer. Water quality analysis shows the heavy metals concentration for all samples are within permitted range for drinking water consumption. However, water sample from Kg Kebayau borehole has the lowest value of electrical conductivity, total dissolved solids, chloride content and heavy metals concentration made it the cleanest among all samples, which is widely used by the villagers of Kg Kebayau for drinking and external purposes.