

Groundwater resources assessment using integrated geophysical techniques in the southwestern region of Peninsular Malaysia.

ABSTRACT

Combined geophysical techniques such as multi-electrode resistivity, induced polarization, and borehole geophysical techniques were carried out on volcano-sedimentary rocks in the north of Gemas as part of the groundwater resource's investigations. The result identifies four resistivity units: the tuffaceous mudstone, tuffaceous sandstone, the tuff bed, and the shale layer. Two types of aquifer systems in terms of storage were identified within the area: one within a fracture system (tuff), which is the leaky area through which vertical flow of groundwater occurs, and an intergranular property of the sandy material of the aquifer which includes sandstone and tuffaceous sandstone. The result also reveals that the aquifer occupies a surface area of about 3,250,555 m² with a mean depth of 43.71 m and a net volume of 9.798 × 10⁷ m³. From the approximate volume of the porous zone (28 %) and the total aquifer volume, a usable capacity of (274.339 ± 30.177) × 10⁷ m³ of water in the study area can be deduced. This study provides useful information that can be used to develop a much broader understanding of the nature of groundwater potential in the area and their relationship with the local geology.

Keyword: Groundwater resources; Electrical resistivity; Induced polarization; Porosity distribution.