

Spatial Variation of Groundwater Potential at Erusu-Arigidi in Ondo State

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Abstract : An investigation has been made of the groundwater potentials of Erusu-Arigidi, Ondo State, Nigeria and using an electrical resistivity survey. This study was motivated to determine the electrical resistivity parameters of the area. This work aims to use the electrical resistivity method to explore the groundwater potentials of the study area. A total of ten vertical electrical soundings (VES) were conducted with a maximum electrode spacing of 150 m. The data was acquired using ABEM SAS 1000 Terrameter and processed using WINRESIST. The interpreted and analyzed results reveal four to six geoelectric layers. The VES curves obtained were QH, H, AAA, HKH, and HA. Findings from the study revealed that the geoelectric layer ranges from 3 to 5 layers. From the result, the Dar Zarrouk parameters longitudinal conductance (S) and transverse resistance (Tr), average longitudinal resistance (ρ_a), transverse resistivity (ρ_t), coefficient of anisotropy (λ), and reflection coefficient ranges from 0.22 to 1.45mhos, 67.12 to 4262.91 Ω/m^2 , 8.81 to 76.12 $\Omega\text{-m}$, 12.0 to 243.5 Ωm^2 , 1.01 to 1.78, and 0.72 to 0.99 respectively. Deduction from S suggested that groundwater tends to be slightly vulnerable to surface contamination. Further findings from Dar Zarrouk parameters revealed that southwest parts of the study area tend to have high groundwater potential when compared to other parts of the study area. While hydraulic conductivity and transmissivity range from 0.003 to 0.051m/day, and 11.16 to 158.30m²/day, results obtained from H and T revealed northwest parts of the study area are considered to be aquiferous when compared to other parts of the research area.

Keywords : variation, isoresistivity, hydraulic conductivity, groundwater

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