

Usman D. Alhassan , Daniel Nnaemeka Obiora , Francisca Nneke Okeke (2017) Geoelectrical Investigation of Groundwater Potentials of Northern Paiko, Niger State, North Central Nigeria

ABSTRACT

Vertical electrical sounding (VES) was carried out in northern part of Paiko, North Central Nigeria, using Abem terrameter model SAS 4000 to determine the subsurface layer parameters (resistivities, depths and thickness) employed in delineating the groundwater potential of the area. A total of six transverses with ten VES stations along each traverse, at intervals of 50 m were investigated. It has a maximum current electrode separation ($AB/2$) of 100 m. Three to four distinct geoelectric layers were observed, namely, the top layer, the weathered layer, the fractured/fresh layer, and the fresh basement layer. The observed frequencies in curve types include 21% of H, 4.2% of HA, 2.4% of K, 4.2% of A, 1.67% of KH and 3% of HK. Eight VES stations were delineated as ground water potentials of the area, with third and fourth layer resistivities ranging from 191 to 398 $\Omega \cdot m$. Depths range from 13.60 to 36.60 m and thickness varies from 9.23 to 30.51 m. A correlation of the borehole log with the VES lithology is in agreement. Viable boreholes for good portable water should be sited at VES stations J8 and J10 having a fine aquifer at a depth of 36.60 and 17.80 m respectively with thickness of 30.51 and 15.07 m, respectively.

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KEY WORDS: vertical electrical sounding, groundwater potential, northern Paiko, resistivity, aquifer, geoelectric layer, Abem terrameter.