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Geoelectrical exploration of the Coastal Plain Sands of Okitipupa area, southwestern Nigeria

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Abstract

The quest for sustainable potable water is an unending struggle as it is one of the pillars that sustain the growth of any community. Okitipupa is being challenged with a low level of access to safe and sustainable water for human activities, thereby limiting the source of potable water in

the area to groundwater resource. In this study, a vertical electrical sounding (VES) technique employing Schlumberger electrode array was used to conduct a geophysical survey in Okitipupa to assess the groundwater potentials and locate promising zones for groundwater exploitation. VES was carried out at 48 locations. The lithological units obtained are topsoil, lateritic sand, clayey sand, silty sand, sand (which is the main aquifer), sandy clay and shale. The topsoil is characterized by clay and lateritic sands. The aquiferous units vary from the second to fifth layers where two percent of the total sounding points showed no signs of groundwater. The range of the delineated aquifer's depths varied from 0.5 to 1.5 m, 0.8 to 14.9 m, 4.2 to 123.4 m and 29.7 to 164.1 m, respectively. The estimated longitudinal conductance in this study indicates that the aquifer's protective capacities vary from poor to good ratings. The central, northwestern and southern parts are the promising zones for groundwater exploration in the study area, with aquifer's depths ranging from 0.5 to 164.1 m. As a result of the nature of lithology of the studied aquifers, discharge of toxic substances that could contaminate the aquifer should be avoided in the study area.

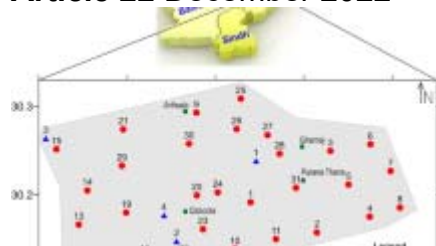
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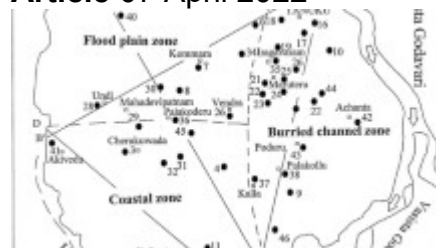
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The authors declare that they have no conflict of interest.

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