

GEO-ELECTRICAL PARAMETERIZATION OF IKOGOSI SPRING WATER

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ABSTRACT

This study examined the subsurface layers, structures and possible source of heat of Ikogosi warm spring employing Vertical electrical sounding technique and Spontaneous Potential (SP) measurement of the surface natural potentials resulting from electrochemical reactions in the subsurface. Vertical Electrical Soundings using Schlumberger array were carried out at three (3) locations along a profile parallel to the flow of the warm spring. Dipole-dipole configuration was also employed to obtain the pseudo section of the subsurface. Along the same profile, Self-potential measurements were taken at every 5m interval along the traverse. The VES survey revealed KH (67 % representation) and HK (33 %) curve types with four subsurface geoelectric sections (the topsoil, fresh Basement, fractured basement and the fresh basement). The 2-D model apparent resistivity structure however, revealed five geoelectric layers including open fractured zone, fractured zone, highly weathered zone, partly weathered zone and fresh basement. The fractured zone houses the groundwater accumulation which moves gradually to where the fracture is open at the surface. The SP revealed existence of deep fracture housing large volume of water as indicated by the + and – sign of the SP potential (1197 volt that subsequently dropped to -1785volt) at the warm spring site. The anomaly also signifies abnormal heat been generated at the bottom of the fracture which may arise from geologic processes that took place within the earth crust. This research needs further work employing Geophysical Radiation Technique to really unravel the source of the heat responsible for Ikogosi warm spring.

KEYWORDS: Natural Potentials, Schulumberger Array, Geo Electric Layers, Fracture, Hea

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