

# **A Comparative Study of Resistivity Sounding Curves from Two Drainage Areas of Kafanchan, Kaduna State.**

Akwuba, Godwin Kingsley

M.Sc. Applied Geophysics

Department of Geology

Obafemi Awolowo University, Ile Ife, Nigeria

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## **Abstract:**

A comparative analysis of resistivity sounding curves obtained from two drainage areas near Kafanchan, Kaduna state, underlain by rocks of the Precambrian basement complex of Nigeria, was carried out. A small part of one of the areas is occupied by the newer basalt. The resistivity investigation was done by the ACME Drillers Limited, Lagos under the auspices of Kaduna State Water Board, Kaduna.

The resistivity data was interpreted by curve matching techniques and by the computer based automatic technique. A quantitative comparison of the VES curves from the two areas was done by studying the geoelectric sections and by the use of a numerical method that essentially compared the shapes and magnitudes of the VES curves. In addition, the VES curves were compared qualitatively by studying the curve types, maps of the Dar Zarrouk parameters (transverse unit resistance (T), longitudinal unit conductance, (S) and the coefficient of anisotropy ( $\lambda$ ), and maps of the approximate depth to the fresh basement complex.

The results obtained showed that characteristics of the VES curves from the two areas are different from each other and that those from the basalt part of the area are particularly different from these from the basement complex part of the two areas. The most probable aquifer layers in the whole area were found to be the weathered zone of the basement complex and the alluvial deposits between the basalt layers.

It is suggested that a multi-electrode profiling work be carried out in the area underlain by basalt in the order to map probable buried river channels.

**Keywords:** Earth resistance/ drainage/ basalt/ aquifer layers/ alluvial deposits

**Supervisor:** B. D. Ako

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