# INTEGRATED CHARACTERIZATION OF ILOKUN DUMPSITE AROUND ILOKUN ADO-EKITI, SOUTH-WESTERN NIGERIA.

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Refuse disposal is a major environmental problem in most Nigeria cities and towns. The leachates from such sites may infiltrate or seep into the subsurface layers and pollute groundwater. Therefore, integrated geophysical methods such as electromagnetic, magnetics and electrical resistivity methods were applied to characterize the subsurface and assess the impact of the leachate on the groundwater quality around Ilokun dumpsite, Ado-Ekiti Southwestern Nigeria. Two wells were selected for analysis and water samples collected for detailed physicochemical analysis. A total of eight traverses were established, trending in the NW-SE and W-E direction. Both the VLF-EM and the magnetic data were acquired along the traverses established at station intervals of 5m. Of these eight traverses, five traverses were investigated using dipole –dipole technique for data acquisition with an electrode spacing of 5m with the expansion factor (N) ranging from 1-5. Seventeen (17) VES stations were occupied within the study area using the Schlumberger electrode array with maximum spread length (AB) ranging from 100m to 130m. The VES data were processed and interpreted by the method of partial curve matching and computer iteration technique to generate the subsurface model.

The VLF-EM results showed series of conductive zones varying from highly conductive zones to moderately conductive zones. The geoelectric section generally revealed a maximum of four geoelectric layers which could be classified into three major geologic layers: the topsoil; the weathered layer and the Fresh basement. Thin layers of laterite were found in the subsurface beneath some traverses. The top soil resistivity varies from 30 ohm-m to 210 ohm-m and thickness ranging from 0.5m to 1.6m. The weathered layer resistivity varies from 6 ohm-m to 52 ohm-m and thickness ranging from 1.5m to 16.5m. The resistivity values of the basement varies from 1500 ohm-m to 13500 ohm-m.The results of the dipole-dipole 2-D resistivity structure correlated with that of electromagnetic profiles, magnetics and geoelectric sections revealed that the subsurface in the dump area is polluted by the infiltrated leachates. The elevation map of the entire area corroborates the downward flow of leachates emanating from the dumpsite as shown in the isoresistivity maps. The results of the physico-chemical analysis showed that the electrical conductivity, temperature, chloride, COD, DO, TDS, TSS, pH fall within WHO and FEPA's standard for portable water.

It was therefore concluded that the leachate from the dumpsite is gradually migrating towards the western part of the study area; thereby polluting the near surface and underground water within the area while areas along the control points and the second well are free from pollution.