

Preliminary Geophysical Assessment of Soil Contaminants around Wacot Rice Factory Argungu, North-Western Nigeria

Authors : A. I. Augie, Y. Alhassan, U. Z. Magawata

Abstract : Geophysical investigation was carried out at wacot rice factory Argungu north-western Nigeria, using the 2D electrical resistivity method. The area falls between latitude $12^{\circ}44'23''\text{N}$ to $12^{\circ}44'50''\text{N}$ and longitude $4^{\circ}32'18''\text{E}$ to $4^{\circ}32'39''\text{E}$ covering a total area of about 1.85 km. Two profiles were carried out with Wenner configuration using resistivity meter (Ohmega). The data obtained from the study area were modeled using RES2DIVN software which gave an automatic interpretation of the apparent resistivity data. The inverse resistivity models of the profiles show the high resistivity values ranging from 208 Ωm to 651 Ωm . These high resistivity values in the overburden were due to dryness and compactness of the strata that lead to consolidation, which is an indication that the area is free from leachate contaminations. However, from the inverse model, there are regions of low resistivity values (1 Ωm to 18 Ωm), these zones were observed and identified as clayey and the most contaminated zones. The regions of low resistivity thereby indicated the leachate plume or the highly leachate concentrated zones due to similar resistivity values in both clayey and leachate. The regions of leachate are mainly from the factory into the surrounding area and its groundwater. The maximum leachate infiltration was found at depths 1 m to 15.9 m (P1) and 6 m to 15.9 m (P2) vertically, as well as distance along the profiles from 67 m to 75 m (P1), 155 m to 180 m (P1), and 115 m to 192 m (P2) laterally.

Keywords : contaminant, leachate, soil, groundwater, electrical, resistivity

Conference Title : ICGS 2020 : International Conference on Geophysics and Seismology

Conference Location : Singapore, Singapore

Conference Dates : July 06-07, 2020