

Analyses of Extent of Effects of Siting Boreholes Nearby Open Landfill Dumpsite at Obosi Anambra Southeast of Nigeria

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Abstract : Solid waste disposal techniques in Nigeria pose an environmental threat to the environment and to nearby resident. The presence of microbial physical and chemical concentration in boreholes samples nearby dumpsite implies that groundwater is normally contaminated by leachate infiltration from an open landfill dumpsite. In this study, the physicochemical and microbial analyses of water samples from hand dug well in the site and boreholes were carried out around the active landfill and from different distances (50 m to 200 m). leachate samples collected were used to ascertain the effect or extent of contamination on the groundwater quality. A total of 5 leachate samples and 5 samples of groundwater were collected, and all samples were analyzed for various physical and chemical parameters according to the standard methods. These include pH, Electrical conductivity, Total dissolved solid, BOD, OD, Temperature, major cations such as Mg^{2+} Ca^{2+} , Fe^{2+} Cu^{2+} , major anions NO_3^- , Cl^- , SO_4^{4-} , PO_4^{4-} , Zn, Ar, Cd, Cr, Hg, Pb, Ni are the heavy metals and metalloids. The mean values of the physical and chemical parameters obtained from both sites were compared with the established of the World Health Organization (WHO). The leachate samples were found to be higher in the concentration of the results obtained than that of the boreholes water, and the recorded mean values of heavy metals were above approved standard minimum limits. The results indicated that mercury and copper were not found in all the borehole water samples. Microbial analyses showed that total heterotrophic bacteria mean count ranged from 10.6×10^7 cfu/ml to 2.04×10^7 cfu/ml and 9.5×10^7 cfu/ml to 18.9×10^7 cfu/ml in leachate and borehole samples respectively. It also revealed that almost at the bacteria isolated in the leachate were also found in the water samples. This results indicated that heavy pollution in all the samples with most physicochemical parameters and microbes showed traceable pollution, which occurred as a result of leachate infiltration into the ground water.

Keywords : physicochemical, landfill dumpsite, microbial, leachate, groundwater

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