Determination of Inland Water and Soil Quality in the Vicinity of a Selected Dumpsite in Ibadan (Ajakanga Solid-Waste Dumpsite), Oyo State

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Certification

This is to certify that Olaoluwa Akintunde OLATISE with matriculation number LCU/PG/001414 carried out this research work titled "Determination of Inland Water and Soil Quality in the Vicinity of a Selected Dumpsite in Ibadan (Ajakanga Solid-Waste Dumpsite), Oyo State" in the Department of Chemical Science, Faculty of Natural and Applied Sciences, Lead City University, Ibadan, Oyo State, for the award of Master Degree in Environmental and Analytical Chemistry and that this has not been previously submitted.

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Dr. John-Dewole **Date**

(Supervisor)

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Prof. O. M. Ighodaro **Date**

(Head of the Department)

Dedication

The entire thesis is a thank-you to Almighty God and I dedicate to God and wonderful parents, Rev. and Rev. (Mrs) Olatise.

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Even though the above-mentioned institutions and persons have assisted in the process of this research work, I alone stand responsible for the errors, if any found in the work.

Abstract

Continuous burning of wastes at municipal dumpsite constitutes environmental hazards to the surrounding communities and human health. Leachate emanating from these dumpsite infiltrate the soil and sometimes get run off to nearby water resources available for domestic,agricultural and industrial use. This study is to evaluate the quality of groundwater,surface water and soil samples collected in the vicinity of an open municipal dumpsite: Ajakanga solid-waste municipal dumpsite in Oluyole LGA, Ibadan, Oyo State. Sixteen water samples (groundwater and surfacewater samples) and four top soil samples were collected within the vicinity of the dumpsite. The samples were analyzed for physiochemical quality check, potentially toxic elements (PTEs) concentrations and microbiological analysis. The physiochemical properties of the samples were determined using standard method of analysis. The value of physiochemical properties of water and soil samples were below the permissible limit of WHO and NESREA. Except some parameters like TSS, Electrical conductivity, Nitrates,Nitrite in well water and stream water; and chloride in soil sample are above the WHO and NESREA limit. The potentially toxic elements (PTEs) identified are Zn, Cu, Mn, Pb, Fe, Cr, Ni and their concentration were determined using Atomic absorption spectrophotometer. The values obtained for these parameters are within acceptable ranges of WHO except Cu, Mn and Cr which are slightly above WHO limit. The microbial analysis of the samples showed microbial loads of high counts above the WHO limit due to biodegradation and decomposition of solid or food wastes, and presence of feaces on the dumpsite. The parameters checked were E. Coli, Total Coliform, Total Heterotrophic. However, bio-accumulation and bio-magnification of these parameters can poses a dangerous health challenges to the environment and life in the communities closed to the dumpsite.

Keywords: Dumpsites, Leachate, Physiochemical, Potentially Toxic Elements (PTEs), Soil and Water Quality.

Word Count: 284

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List of Acronyms

Abbreviation	Meaning
AAS	Atomic Absorption Spectrometer
BOD	Biochemical oxygen demand
COD	Chemical oxygen demand
DO	Dissolved Oxygen
HB	Haemoglobin
Methb	Methaemoglobin
TDS	Total Dissolved Solids
WHO	World Health Organization
PTEs	Potentially Toxic Elements
EC	Electrical Conductivity
LOD	Limit of Detection
UV Detection	Ultraviolet Detection
BGE	Background Electrolyte
HNO3	Hydrogen Trioxonitrate
KCL	Potassium Chloride
NESREA	National Environmental Standard and Regulation Enforcement Agency
WQI	Water Quality Index
EPA	Environmental Protection Agency