Heavy Metal Contamination of Soils around the Clinical Waste Incinerator Bottom –Ash Dumps Site at the Korle-Bu Teaching Hospital

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2014

ABSTRACTS

Incineration is one of the key methods for treating clinical waste in the Korle Bu Teaching Hospital. Incinerated clinical waste bottom ash has more heavy metals which if not welldisposed of could pollute the environment and pose a great danger to public health. In Ghana, incinerated clinical waste bottom ash is dumped on the bare ground which contaminates surface soil with heavy metals and other pollutants or carried up into the atmosphere by wind and pollutes the air. The aim of this study was to assess heavy metals (Hg, Pb, Zn, Ag, Cr and Cd) concentrations of bottom ash and the pollution status of surrounding soils at a clinical waste dumpsite. Incinerator bottom ash were collected twice weekly over a 4 months period while soil samples were also collected at distances of 20 m, 40 m, 60 m, 80 m and 100 m away from the ash dump site over the same period of time. Soils analyzed from a point, located 1200 m away from the ash dump site was used as control. Ash and soil samples were acid digested by following standard extraction procedure. Heavy metal analysis of soils and ash were done using Atomic Absorption Spectrophotometer methods (AAS). Findings from the analysis revealed that the bottom ash sample had relatively high mean concentrations for, Cd (7.54 mg/kg) , Pb (143.80 mg/kg) , Cr (99.30 mg/kg) and Zn (16417.69 mg/kg) when compared to *WHOIF* AO recommended values for soils. Levels for Ag (28.38 mg/kg) and Hg. (0.88 mg/kg) in ash samples were however lower compared to *WHOIF* AO recommended values. Heavy metals levels in soil samples at 20 m, 40

m and 60 m respectively were all higher than *WHOIF* AO and US, EP A recommended values. The concentrations of the heavy metals in soils were however observed to decrease with increasing distance from the ash dumpsite. Enrichment Factor, Geo-accumulation Index and Pollution Load Index revealed a high pollution by Pb, Cd and Zn in soils while the other metals reflected background concentrations. It is recommended that incinerated clinical bottom ash should be disposed of by properly designed - engineered landfill to protect the environment.

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