

## Assessment of Radiation Dose with Excess Life Cancer Risk of Mining Dumpsites Of Wase, Plateau State, Nigeria.

Daburum, N. H.<sup>1\*</sup>, Songden S. D.<sup>2</sup> and Mangset E.W.<sup>2</sup>

1. Department of Physics, Federal College of Education, Pankshin, Plateau State, Nigeria

2. Department of Physics, University of Jos, Plateau State, Nigeria

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### Abstract

Mining dumps soils at Wase mine, Plateau State, Nigeria were assessed for their natural radionuclides (<sup>226</sup>Ra, <sup>232</sup>Th and <sup>40</sup>K) contents using gamma-ray spectrometric technique. The radiological hazards were computed. The mean activity concentration of Base metal mining dumps (BMD) for <sup>226</sup>Ra, <sup>232</sup>Th and <sup>40</sup>K were obtained as 59.74±4.68, 123.00±4.12 and 309.46±7.74 Bqkg<sup>-1</sup> respectively. Similarly, the mean activity ratios <sup>226</sup>Ra / <sup>40</sup>K and <sup>232</sup>Th/<sup>40</sup>K were obtained as 0.47 and 0.75 respectively. The mean gamma absorbed dose rate was 109.77nGy/hr, Annual Effective Dose Equivalent, AEDE (indoor) was 0.13mSv/yr, the average AEDE (outdoor) calculated was 0.54mSv/yr and the Annual Gonadal Dose Equivalent (AGDE) obtained was 762.54mSv/yr. The Excess Lifetime Cancer Risk Index (ELCR) was 4.65 x 10<sup>-3</sup> as its mean value. All the radiation hazards and ELCR evaluated were greater than the world's permissive limits. These values imply that the study area is radiologically unsafe for agricultural activities and residential purposes. Further investigation was recommended using the High Purity Germanium (HPGe) detector for the locations.

**Keywords:** Radionuclides, Activity concentration, Indices, Hazard, Cancer

\* Corresponding author email: nanleh@yahoo.com