

Natural Gamma Background Radiation Dose Rate and Its Relationship with Geological Background in the Kinta District, Perak, Malaysia

Abstract

A survey of natural gamma background radiation (NGBR) levels in the Kinta District was carried out for three years between 2003 and 2005. Dose rates were measured from 1007 locations by using a portable gamma-ray survey meter manufactured by Ludlum, Model 19 MicroR Meter. The measured dose rates ranged from 39 to 1039 nGy h⁻¹. It has a mean dose rate of 222 ± 191 nGy h⁻¹. Small areas of hot spot around Kampung Sungai Durian with dose rates of 1039 ± 104 nGy h⁻¹. This is the highest recorded in Perak to date. Geological type G5 is Jurassic – Triassic, the rock type is mainly granites. It exhibits the highest mean dose rate of 432 ± 259 nGy h⁻¹. The dose rates range from 91 to 1039 nGy h⁻¹. The lowest recorded was on sandstones, the dose rate is 39 nGy h⁻¹. The mean population weighted dose rate for the Kinta District is 1.12 mSv y⁻¹. Gamma isodose map for the Kinta District was plotted.