

Radioactivity measurements at eastern Lesvos, Greece

D. Avgerinos¹, E. Kapilaris¹, F.K. Pappa^{1,2}, G. Poulis¹, G. Kuburas^{1,3}, C. Matsoukas¹

¹ Department of Environment, School of Environment, University of the Aegean, University Hill, 81100 Mytilene, Greece,

² Institute of Oceanography, Hellenic Centre for Marine Research (HCMR), 46.7 km Athens-Sounion, Attiki, Greece

³ Environmental Radioactivity Laboratory, Institute of Nuclear and Radiological Sciences and Technology, Energy and Safety, National Centre for Scientific Research “Demokritos”, 153 10 Aghia Paraskevi, Athens, Greece.

The radioactive background of the eastern side of Lesvos Island in Greece, an island rich in natural radioactivity, was studied by means of gamma ray spectroscopy. Dose rates and concentrations of natural radionuclides (²³²Th series, ²²⁶Ra and ⁴⁰K) and ¹³⁷Cs were measured in-situ and in the laboratory, respectively. A total of twenty soil samples and ten beach sand samples was collected and processed according to the IAEA protocol. For the in-situ measurement and the dose rate determination a portable NaI scintillation detector was utilized. The activity concentration calculations were held in the laboratory, with the use of a high purity germanium detector. These activity concentrations were also used to estimate dose rates, so as to compare the obtained results with the in-situ measurements. The maximum detected values of activity concentrations of ²³²Th series, ²²⁶Ra, ⁴⁰K and ¹³⁷Cs were found to be 194, 92, 958 and 70 Bq kg⁻¹, respectively. As for the dose rates, both measured and estimated, the maximum values were 225 and 187 nGy h⁻¹, respectively. A significant difference regarding activity concentrations and dose rates was observed between the two matrices (soil, beach sand), with the values of soil samples quite surpassing those of beach sand samples. That can be attributed to the granulometry of each matrix. Furthermore, the study attempts to compare the radioactive background between the eastern and the western side of Lesvos Island, where the enhanced values were found in the eastern part.