



## Radium and Radon Concentration in Geothermal Springs, Surat Thani, Thailand

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### Abstract:

Three locations of geothermal springs in Surat Thani province were selected due to the high background of natural radium-226. In those areas, ambient gamma dose rates were measured using polymaster gamma surveys in conjunction with the Mobile-Integrated Nuclear Security Network (M-INSN) program developed by IAEA. Radioactivity of Ra-226 in sediment samples were measured using gamma spectrometry with HP-Ge detector of Terrestrial Radioecological Laboratory, Office of Atoms for Peace whilst radon concentration in spring samples were onsite counting using RAD-7 electronic radon detector. Results suggested area of Kao Tan saline hot spring has been highly contaminated with Ra-226 (1.132-14.83  $\mu$ Sv/h of ambient gamma dose rates, 16,983 $\pm$ 920 Bq/kg of Ra-226 in sediment and 15 $\pm$ 2-4103 $\pm$ 119 Bq/L of radon in spring) whereas the area of Khawtok hot spring (0.210-4.86  $\mu$ Sv/h, 14,972 $\pm$ 811 Bq/kg and 55 $\pm$ 4 Bq/L) and Ban Wad Kaew hot spring (0.124-2.369  $\mu$ Sv/h, 2,602 $\pm$ 141 Bq/kg and 36 $\pm$ 3 Bq/L) have been lower contamination. It concluded that in area of those geothermal springs have been contaminated with natural radium from the underground water but only radon in the spring at Kao Tan saline hot spring is higher than the limit of alternative maximum concentration level (AMCL) in raw water suggested by the US.EPA (150 Bq/L) and perhaps needs appropriate management.