

Estimation of Environmental Radiological Doses and Risk on Disposal of Oil Scale Wastes NORM by Landspreading and Landfill using the RESRAD-OFFSITE Code

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Objectives and Methodology

The RESIDUAL RADIOACTIVE OFFSITE code (RESRAD-OFFSITE), that evaluates the radiological dose and excess cancer risk to an individual who is exposed while residing and/or working in or near an area where the soil is contaminated by radionuclides, was used to estimate the radiological doses and risk on disposal of oil scale wastes NORM by landspreading and landfill.

Four samples were used from twenty-three oil scale samples obtained from the Libyan oil and gas industry production facilities onshore that activities have been measured using high-resolution gamma-ray spectrometry with a shielded HPGe detector in the Environmental Radioactivity Laboratory at the University of Surrey – UK.

Two scenarios of landspreading and landfill to disposal oil scale wastes NORM with activities similar to these four samples were used in the RESRAD-OFFSITE code to estimate the environmental radiological doses and risk. For the simulations, the future uses of the lands was rural resident farmer.

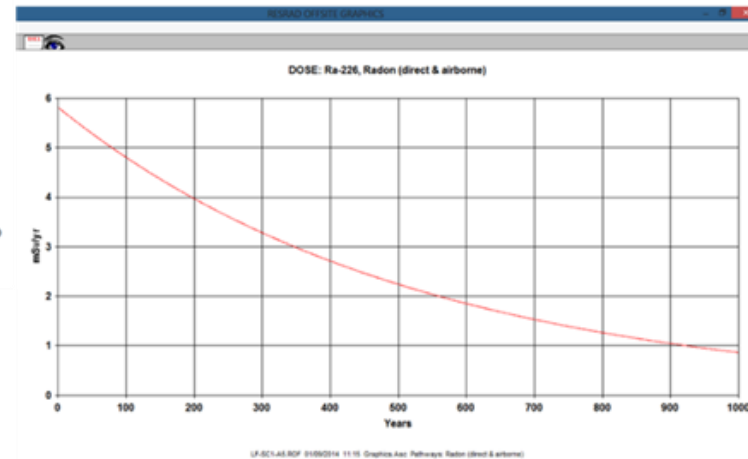
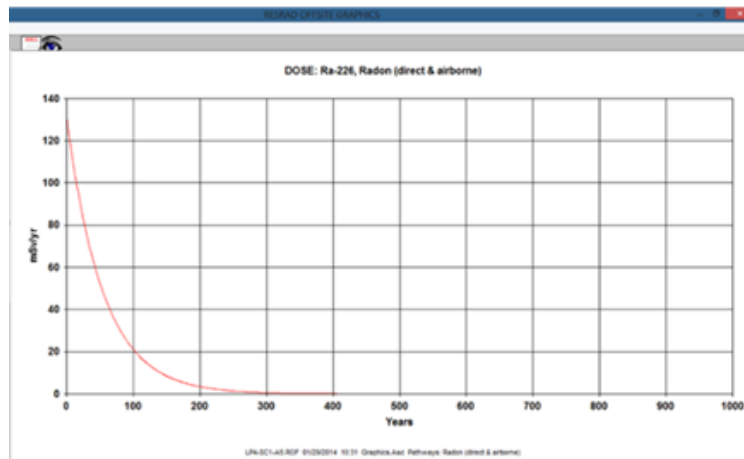
Summary of Results

Doses due to Ra-226 for
landspreading and landfill scenarios.

Landspreading

Radionuclide			Specific activity (Bq/g)
Th-232	Ra-228	Ac-228	3.29
	Th-228	Tl-208	3.98
U-238	Ra-226	Bi-214	11.79

Landfill



The main results were that, without exceeding the dose limitation, the deposition by landfill may be a safety option for the disposal of oil scale wastes NORM with specific activity up to 10 Bq/g and for deposition of landspreading may have as reference specific activity less than 1 Bq/g both for chain of U-238 and Th-232.