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# Radiological impact of Cs-137 release from the near surface disposal facility at Serpong Nuclear Center to environment: Effect of compacted bentonite layer

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The Near Surface Disposal (NSD) facility which designed by the Center for Radioactive Waste Technology (CRWT) needs to be evaluated from the possibility of radionuclide release from the facility to ensure its radiation safety to human and environment. Cesium-137 was chosen as the radionuclide of concern due to its high mobility in environment, long half-life, and total activity in waste inventory at CRWT. Radiological impact (i.e dose and excess cancer risk) was assessed using RESRAD-OFFSITE 4.0 version. Input data such as dimension and characteristics of NSD and local soil, activity of inventory, weather data, food and water consumption, occupancy time of critical grup, and other inputs related to the impact to critical groups had been prepared. Sensitivity analysis on thickness of compacted bentonite from 0.05 m to 1 m was conducted. The purpose of this study is to estimate the potential radiological impact of an NSD facility by considering the effect of bentonite thickness variation on NSD foundation. From the results, maximum dose of critical group still below 1 mSv/year. Increasing the bentonite thickness from 0.05 m to 1 m will reduce the critical group dose from 3.38×10-2, 2.99×10-2, 2.04×10-2, and 1.35×10-2 mSv/y, while its cancer risk from 2,12×10-4 to 1,5×10-4. Changes in the thickness of the compacted bentonite layer are able to reduce the dose and risk effectively. It means that the thicker compacted bentonite layer can reduce the impact of Cs-137 radiological hazards from waste packages stored in the NSD facility to critical groups and the environment.

## Technical Track

Fuel Cycle and Waste Management

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