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Site Selection for Landfill Disposal of NORM Waste from Tin Industry in Bangka Island

Bangka Island is the largest tin producer in Indonesia and number two in the world. Processing of tin ore in Bangka island will cause the spread of radioactive substances from associated minerals with high concentrations. One thing that needs attention is the final management of the TENORM waste from the process. From the survey results it was concluded that what remains a problem for the environment is slag with a very small tin content of less than 2%, which is called the final slag. The final slag which is a TENORM waste that needs to be disposed off in a safe and secure landfill disposal facility. To create a TENORM waste landfill facility from the tin industry, the following steps are required, namely 1) determining the site criteria and landfill disposal design compiled based on government regulations, IAEA guidance and expert opinion; 2) tracking and inventorying data from various reference on landfill, technology and safety aspects; 3) evaluation of data to be used as a basis for assessment. The selected site is determined from the requirements that have been determined in the final disposal criteria such as soil / rock permeability, depth of ground water level, hydrological, geomorphology, geochemistry, seismicity and others aspects. In addition the selected site must pay attention to the spatial planning, land ownership, and others. Beside that the approval of the local government and the community is highly required. The criteria and methodology used in this study are in accordance with IAEA guidance in Safety Series No. 111-G-3.1. Maps that are analyzed and evaluated according to the needs and availability of data are geo-morphological data (contour maps, river maps), geological data (geological maps, geological structure maps), spatial planning data (map) and mineral resource maps. Site selection is done with spatial analysis by descriptive, scoring, overlay and buffering methods using ArcGIS-10 software. Site selection is based on site criteria that have been determined at the concept and plan stage. Based on the above analysis, the results of several maps of potential areas / sites in West Bangka, Bangka Tengah and Bangka Selatan districts are obtained. In these regencies, it is recommended that potential sites represent rock strata from the Tanjunggending Formation composed of meta-sandstone, sandstone, clayey sandstone and claystone. The potential site recommendation has also considered its suitability with the spatial plan suitable for the TENORM waste landfill site. In addition, there are other possible options for landfill site determination, namely the principle of co-location or direct appointment in the former mining area that meets the safety criteria based on site evaluation.

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