

TRANSPORT OF NORM: HEAVY MINERALS CONCENTRATES MINERALS IN SOUTH AFRICA

Background and Objectives

The regulated activities involving Naturally Occurring Radioactive Material (NORM) in South Africa (SA) include the mining and processing of Gold, Copper, Uranium, Heavy Minerals Concentrates, Phosphate rock, Manufacturing of Fertilizers, Recycling of scrap material contaminated by NORM, Small users (i.e. laboratories) conducting tests of small quantities of NORM samples for verification of proposed and existing actions, including samples from prospecting activities and Service providers (i.e. storage warehouse). The regulation of these industries is through the issuance of two types of nuclear authorisation depending on the associated radiation risk, i.e. the Certificate of Registration (COR).

Materials and Methods

The mining of Heavy Mineral Concentrates (HMC) which includes zircon, rutile, monazite which are radioactive in nature and includes the minerals that are not radioactive such as garnet, and ilmenite occurs within South Africa (SA) along the western to the eastern coast. The maximum activity concentration of the radioactive HMC has reached about 9 Bq/g, making them exempted from transport regulations. However, studies have shown that in some cases the limit of 10 Bq/g limit for some radio nuclides can be exceeded (SSR-6). Therefore, the authorisation holder must constantly prove that their material is exempted from the transport regulations. HMC miners have taken a precautionary approach to conduct more analysis prior dispatching their consignments. The most effective and efficient method in terms of turnaround time is through XRF-analysis and at a lesser frequency by full radionuclide analysis. These analyses are conducted at accredited laboratories.

Other NORM industries handle material that is exempted from transport regulations as is evident from their laboratory analysis results. The waste material produced in all industries including the HMC can be decontaminated to below Surface Contaminated Objects (SCO) –1 levels and therefore transported as cleared waste.

Results and Discussion

The HMC industry handles radioactive material that sometimes falls under transport regulations and will therefore constantly need to analyze their consignments to know when to apply the regulations as per SSR-6. Other NORM industries need to ensure that materials although radioactive but not falling under transport regulations are transported in a secure manner. Based on the outcome of their assessment, authorisation holders are required to draft their transport procedures to detail the process to follow for their material will be transported considering the available regulations.

Conclusion submission

It is the responsibility of the authorisation holders to constantly analyze and determine if their material needs to be transported under SSR-6 requirements or provide a justification that their material is exempted. Records for justification for exemption need to be maintained to ensure that they are available for review by the regulator.

Country or International Organization

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Instructions

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