

## **The impact of NORM on radioactive waste disposal in Germany**

Markus R. Schmidt<sup>1</sup>, Karin Kugel<sup>2</sup>, Dr. Bernd Hoffmann<sup>3</sup>

<sup>1,2</sup>*Bundesamt für Strahlenschutz, Willy-Brandt-Straße 5, D-38226 Salzgitter*

<sup>3</sup>*Bundesamt für Strahlenschutz, Köpenicker Allee 120 – 130, D-10318 Berlin*

<sup>1</sup>*Phone: +49 30 18333-1951, Fax: -1605, E-mail: mrschmidt@bfs.de*

### **Abstract**

Naturally occurring radioactive material (NORM) can accrue in mining and processing industries. The utilization and disposal of NORM in Germany is regulated within the scope of the Radiation Protection Ordinance (Part 3 StrlSchV). Depending on their characteristics, their intended utilization and removal, different surveillance limits were introduced. According to the Closed-Cycle Management Act (KrWG), NORM can be released from regulatory control in order to be disposed of at landfill sites, if it is in compliance with Part 3 StrlSchV.

Apart from this waste stream, the utilization and disposal of radioactive waste is regulated within the scope of Part 2 StrlSchV. In Germany, most of the radioactive waste can be considered as artificially generated radioactive material due to the use of nuclear power, but there is some NORM that is radioactive waste because its ionizing radiation is used for application. All types of radioactive waste in Germany have to be disposed of in deep geological formations.

A challenge in this disposal concept is NORM that cannot be released from regulatory control. A research project (3610R03250) was started to investigate the amount and type of NORM that is still under surveillance. The project has identified 450 to 480 metric tons of NORM at interim storage facilities. The two major challenges for disposal of that type of waste are the decreasing number of landfill sites for NORM and the decreasing number of landfill operators accepting NORM as well. This means that the radiation level is not the cause of a failed release from surveillance; it is the decreasing number of useable landfill sites.

Therefore, another disposal option has to be considered. In this regard, a comparison was undertaken in relation to the waste acceptance requirements for the repository Konrad and the characteristics of NORM that is still under surveillance. The investigation revealed that the repository Konrad is not a suitable disposal path because NORM was not considered (was unknown) as a possible waste stream, during the planning phase.

Two alternatives were proposed as a solution, if the disposal situation will get worse in the future. Besides the conventional disposal path, a landfill site or a disposal re-

pository only for NORM residues can be constructed. For these two options, further investigations are necessary.

---