OPEN ACCESS Freely available online

Journal of Pollution Effects & Control

Commentary

A Note on Radioactive Waste and its Applications

Elena Tercero*

Department of Genetics and Microbiology, University of Malaya, Kuala Lumpur, Malaysia

DESCRIPTION

A type of hazardous waste that contains radioactive material is radioactive waste. Many activities, including nuclear medicine, nuclear research, nuclear power generation, rare-earth mining, and nuclear weapons reprocessing, produce radioactive waste. Government agencies regulate the storage and disposal of radioactive waste in order to protect human health and the environment.

Radioactive waste is divided into three categories: low-level waste, which contains small amounts of mostly short-lived radioactivity, intermediate-level waste, which contains higher amounts of radioactivity and requires some shielding, and high-level waste, which is highly radioactive and hot due to decay heat and thus requires cooling and shielding. Approximately 96 percent of spent nuclear fuel is recycled into uranium-based and mixed-oxide fuels in nuclear reprocessing plants. Fission products, which are highly radioactive High-Level Waste, account for the remaining 4%. Because the radioactivity of this material naturally decreases over time, it is stored in appropriate disposal facilities for a sufficient period of time until it no longer poses a threat.

The amount of time radioactive waste must be stored varies according to the type of waste and radioactive isotopes. Short-term approaches to radioactive waste storage have included segregation and surface or near-surface storage. Burial in a deep geological repository is a preferred solution for long-term high-level waste storage, while re-use and transmutation are preferred methods for reducing the HLW inventory. As part of the International Atomic Energy Agency's Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, a summary of the amounts of radioactive waste and management approaches for most developed countries is presented and reviewed on a regular basis.

Radioactive waste management is the safe treatment, storage, and disposal of liquid, solid, and gas discharges from nuclear industry operations in order to protect people and the environment. Any activity that uses nuclear materials, including medical and industrial uses, generates radioactive waste of various types. However, because of the larger volumes generated and the long-lived nature of nuclear energy, it is the most important source of such wastes. Radioactive wastes, regardless of their source, must be managed in a safe and cost-effective manner.

In general, radioactive waste is classified into three types: low-level waste, intermediate-level waste, and high-level waste, based on its level of radioactivity and the length of time it remains hazardous. The disposal of LLW and most ILW is a mature practise, while the majority of HLW is safely stored in dedicated facilities. Permanent disposal of HLW in deep geological repositories is accepted by the scientific and technical communities, but it has yet to be accepted by civil society in many countries.

Since 1959, the majority of Low Level Waste (LLW) from across the UK has been disposed of at the Low Level Waste Repository (LLWR) in Cumbria. Previously, waste was placed in landfill-style trenches, but it is now grouted in metal containers before being stacked in concrete lined, highly engineered vaults. When the vaults are full, a cap will be placed over the containers. The Dounreay site in the north of Scotland also has a new LLW repository. This repository will only accept solid waste from Dounreay site operations and the nearby Vulcan Naval Reactor Test Establishment of the Ministry of Defence.

Existing LLW disposal facilities have strict limits on the amounts of various radionuclides they can accept. A very small fraction of solid LLW, most notably graphite from reactor cores, cannot be disposed of in existing facilities due to the risk of exceeding permitted radioactivity limits. This waste may also be difficult to distinguish from related Intermediate Level Wastes (ILW). As a result, when developing the long-term disposal option for Higher Activity Wastes, this small proportion of LLW must also be considered. Authorized landfill sites can accept LLW with very low radioactivity levels for disposal alongside municipal and commercial wastes. The amount of waste that can be disposed of in this manner is strictly limited. Highly radioactive waste, also known as high-level waste, is classified into two types. One type of waste fuel is that which was used to generate electricity in nuclear power plants. The other type of waste is generated by nuclear weapons production facilities or facilities that reprocess and recycle used power plant fuel.

Correspondence to: Dr Elena Tercero, Department of Genetics and Microbiology, University of Malaya, Kuala Lumpur, Malaysia, E-mail: elena-TERCERO@um.edu.my

Received: 04-May-2022, Manuscript No. JPE-22-1 7008; **Editor assigned:** 09-May-2022,PreQC No. JPE-22-17008 (PQ); **Reviewed:** 25-May-2022 QC No. JPE-22-17008; **Revised:** 01-June-2022, Manuscript No. JPE-22-17008 (R);**Published:** 08-June-2022; DOI: 10.35248/ 2375-4397.22.10.338.

Citation: Tercero E (2022) A Note on Radioactive Waste and its Applications. J Pollut Eff Cont. 10:338.