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Deep Geological Disposal Facilities for Radioactive Wastes

Various industrial, medical radioisotope, and research applications of radioactive materials generate radioactive waste. In order to protect humans and the environment, radioactive waste (RW) must be properly managed, which entails isolating or containing RW so that harmful radionuclides do not escape into the biosphere. The acknowledged method for disposing of radioactive wastes with greater activity and longer half-lives is engineered emplacement in deep geological disposal facilities (GDFs), which are located hundreds of meters underground. Geological disposal seeks to isolate and contain nuclear waste through proper facility design and operation, siting in a suitable geological environment, and the use of an engineered barrier.

Significant progress has been made in implementing these facilities. Nevertheless, there have been delays in the disposal programs of several nations. In recent years, the concept has moved closer to implementation, but there has been growing support for delaying it and examining alternative waste management solutions. Consequently, the purview of this article is a review of developments in the field of deep geologic disposal and the management of long-lived wastes designated for deep geologic disposal.

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