

Soil Based Barriers for a Low and Intermediate Level Radioactive Waste Disposal

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Paper No. ICEM2003-4761, pp. 571-573; 3 pages

doi:10.1115/ICEM2003-4761

From: ASME 2003 9th International Conference on Radioactive Waste Management and Environmental Remediation

9th ASME International Conference on Radioactive Waste Management and Environmental Remediation: Volumes 1, 2, and 3

Oxford, England, September 21–25, 2003

Conference Sponsors: Nuclear Engineering Division and Environmental Engineering Division

ISBN: 0-7918-3732-7 | eISBN: 0-7918-3731-9

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ABSTRACT

abstract

The loess terrains near "Kozloduy" NPP are among the prospective areas for the disposal of low and intermediate level radioactive waste. The analysis of the loess properties has shown two main problems: a loess collapsibility and water permeability. Using a soil-cement cushion under the repository foundation and a soil-cement backfill between the containers is a possibility to avoid these disadvantages. In this connection loess-cement mixtures with bentonite and clinoptilolite additives have been investigated. The aim of mixtures is to improve the impermeability and sorption properties against radionuclide migration. In the paper strength parameters of two kind of mixtures are discussed. According to their water content some are compacted at the optimum moisture content until the maximum dry density and others are compacted at higher moisture content equal to the liquid limit of loess. For the first type of mixtures the unconfined compressive strength (UCS) varies from 2 to 6 MPa depending on the cement and additives percents. Permeability measurements have shown satisfactory results. The UCS for the second type of mixtures is less than the first type, but is sufficient for a backfill between the waste containers. The conclusion is that the loess-cement mixtures, especially these with clinoptilolite additive, are prospective as barriers of a low and intermediate level radioactive waste repository.

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