



Department of Energy
Office of Civilian Radioactive Waste Management
Office of Repository Development
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QA: N/A
Project No. WM-00011

MAY 28 2004

OVERNIGHT MAIL

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TRANSMITTAL OF REPORT *TECHNICAL BASIS DOCUMENT NO. 10: UNSATURATED ZONE TRANSPORT, REVISION 1, ADDRESSING KEY TECHNICAL ISSUE (KTI) AGREEMENTS RELATED TO UNSATURATED ZONE TRANSPORT*

This letter transmits *Technical Basis Document No. 10: Unsaturated Zone Transport, Revision 1* (enclosure 1) and a compact disk (CD) of the report (enclosure 2). The CD contains a pdf file with 10,241 KB and is publicly available. This Technical Basis Document contains a summary of the current conceptual understanding of transport in the unsaturated zone and provides the context within which individual KTI agreements related to transport in the unsaturated zone are addressed. Appendices A through C provide direct responses to the following Radionuclide Transport (RT), Total System Performance Assessment and Integration (TSPAI) KTIs, and related General (GEN) 1.01 agreements:

Appendix A - Data from the Busted Butte Tracer Tests and Block Tests (Response to RT 1.02 and 3.10 and GEN 1.01 (Comment 27))

Appendix B - Unsaturated Zone Transport below the Repository (Response to RT 3.01 and 3.04)

Appendix C - Active-Fracture Concept in the Unsaturated Zone Transport Model (Response to TSPAI 3.28 and 3.29)

The enclosed report is one in a series of Technical Basis Documents that are being prepared to describe the Yucca Mountain, Nevada, repository system components and processes which are important for estimating the likely postclosure performance of the repository. The information presented in these documents, along with the associated references, forms an outline of the postclosure safety analysis that is being developed for the License Application (LA).

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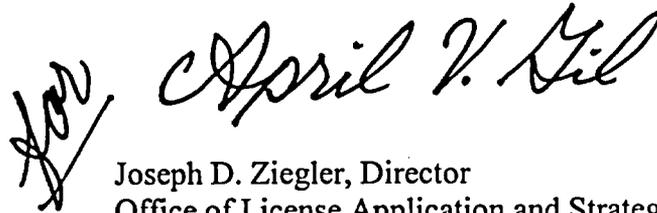
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This information also responds to KTI agreements made between the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE). Placing the DOE responses to individual KTI agreements in the context of the applicable repository system components and processes allows for a more direct discussion of the relevance of the agreements to the postclosure safety analyses that will be presented in the LA.

The enclosed Technical Basis Document provides a summary of the conceptual understanding of the general issues affecting transport of radioactive solute and colloidal species through the unsaturated zone of Yucca Mountain and an evaluation of the relative importance of the controlling factors and conditions. The postclosure performance of the repository is determined in part by the ability of radionuclides escaping from the waste packages to reach the water table. The amount and rate of radionuclide arrival at the water table after potential releases from the repository have a direct impact on downstream components of the Yucca Mountain system (i.e., on transport in the saturated zone underneath Yucca Mountain and possible later appearance in the biosphere).

The DOE considers the KTI agreements covered in *Technical Basis Document No. 10: Unsaturated Zone Transport*, Revision 1, to be fully addressed, and pending review and acceptance by NRC, they should be considered complete.

There are no new regulatory commitments in the body or the enclosure to this letter. Please direct any questions concerning this letter and its enclosure to Carol L. Hanlon at (702) 794-1324 or e-mail carol_hanlon@ymp.gov, or Eric T. Smistad at (702) 794-5073 or e-mail eric_smistad@ymp.gov.



Joseph D. Ziegler, Director
Office of License Application and Strategy

OLA&S:CLH-1104

Enclosures:

1. *Technical Basis Document
No. 10: Unsaturated Zone Transport
Revision 1*
2. CD of Enclosure 1

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