

March 17, 2000

Dr. English Pearcy, Manager  
Geohydrology and Geochemistry Element  
Center for Nuclear Waste Regulatory Analyses  
6220 Culebra Road, Bldg. 189  
San Antonio, Texas 78238-5166

**SUBJECT: COMPLETION OF INTERMEDIATE MILESTONE - IM 1402.861.010 - LETTER REPORT "ANALYSIS OF NICHE STUDIES AND DEVELOPMENT OF BASES FOR TOTAL SYSTEM PERFORMANCE ASSESSMENT SEEPAGE PARAMETERS"**

Dear Dr. Pearcy:

The U.S. Nuclear Regulatory Commission staff has completed its review of the subject report. It was sent on March 3, 2000, meeting the due date. This product is programmatically and technically acceptable for publication and will be entered as a public document. I find the report does an excellent job of analyzing field studies and models of water seepage into drifts, niches, and alcoves at Yucca Mountain. It provides inferences about seepage based on patterns of mineralization in fractures and lithophysal cavities. The report will help us evaluate DOE's estimates of the fraction of waste packages that may receive seepage. It describes a conceptual model of unsaturated flow that occurs in three modes. These are matrix flow, flow through fracture networks, and preferential flow along subvertical zones of high permeability. The report sets the stage for our future review of data being collected by DOE in the east-west drift. The authors state that most concerns about uncertainties in drift seepage could be alleviated if DOE followed the recommendations of their peer reviewers. Comments from those reviewers, the Drift Seepage Peer Review Panel, were published in 1999.

The Center report supports resolution of the deep percolation subissue (key technical issue: Unsaturated and Saturated Flow Under Isothermal Conditions). The milestone relates to several sections of the Yucca Mountain Review Plan. These include 3.2.1.3.3 (Quantity and Chemistry of Water Contacting Waste Packages and Waste Forms); 3.2.1.3.5 (Spatial and Temporal Distribution of Flow); and 3.2.1.3.6 (Flow Paths in the Unsaturated Zone).

If you have any questions, please call me at (301) 415-6615.

Sincerely,

Neil Coleman, Program Element Manager  
Division of Waste Management  
Office of Nuclear Material Safety and Safeguards

cc: J. Linehan  
B. Meehan  
B. Sagar, CNWRA

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