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

February 14, 2000

SUBJECT: COMPLETION OF INTERMEDIATE MILESTONE - IM 1402.861.050 - LETTER REPORT "COMPARISON OF NUMERICAL AND ANALYTICAL MODELS OF UNSATURATED FLOW AROUND UNDERGROUND OPENINGS: CONSIDERATIONS FOR PERFORMANCE ASSESSMENTS OF YUCCA MOUNTAIN, NV, AS A HIGH-LEVEL NUCLEAR WASTE REPOSITORY"

Dear Dr. Pearcy:

The U.S. Nuclear Regulatory Commission staff has completed its review of the subject report, which is enclosed. It was sent on January 13, 2000, well ahead of the January 21 due date. This product is programmatically and technically acceptable for publication and will be placed in our public document room. The report addresses numerical and analytical modeling of seepage into underground tunnels. It shows how large errors in predicted seepage can be caused by grid discretization. Seepage will be underestimated if the grid representing the drift wall is too coarse. Fine discretization is needed to resolve the sharp saturation and pressure gradients at the tunnel wall interface. The amount of seepage that contacts waste packages is a key factor that influences waste package lifetime and long-term isolation of waste in a repository. The Center report supports resolution of the subissue on deep percolation under the key technical issue "Unsaturated and Saturated Flow Under Isothermal Conditions." The report can help us independently interpret analyses of seepage data being collected in the Exploratory Studies Facility and East-West Drift. It relates to the following sections of the Yucca Mountain Review Plan: 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 contact me at (301) 415-6615.

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

Enclosure: CNWRA letter report IM 1402.861.050 dated 1/13/2000
cc: J. Linehan
B. Meehan
B. Sagar, CNWRA

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