



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 10, 1999

Dr. Donald L. Baker  
Aquarius Engineering  
2000 West Maine Street  
Fayetteville, AR 72701-6257

Dear Dr. Baker,

This responds to the technical questions you raised with Dr. Richard P. Savio of the U.S. Nuclear Regulatory Commission (NRC) Advisory Committee on Nuclear Waste, in a letter dated July 13, 1999, and an electronic mail dated September 2, 1999. I understand that you are concerned about the accuracy and possible errors in the numerical modeling of the unsaturated zone at Yucca Mountain by the U.S. Department of Energy (DOE). We appreciate your concern and we will certainly take your comments into consideration in our ongoing reviews of the unsaturated zone model.

Our technical staff is aware of the limitations of using numerical models to assess the performance of a potential high-level waste repository at Yucca Mountain, including unsaturated zone modeling. Technical staff from NRC and the Center for Nuclear Waste Regulatory Analyses have been reviewing and will continue to review unsaturated zone models. Your comments will be considered in the next technical staff review. That review will be documented in a report to be issued next fiscal year under the title: "Issue Resolution Status Report, Key Technical Issue: Unsaturated and Saturated Flow under Isothermal Conditions, Revision 3," currently scheduled for publication in July 2000. Issue Resolution Status Reports (IRSRs) have been issued annually by the Division of Waste Management since 1998. They are the primary mechanism we use to provide NRC comments to DOE on technical issues of concern to the staff. A copy of the current IRSR pertaining to the unsaturated and saturated zone flow issues (Revision 2, June 1999) is enclosed. The IRSRs are also posted on the INTERNET (<http://www.nrc.gov/NMSS/DWM/irsr.htm>).

The U.S. Department of Energy has the primary responsibility for development and validation of all numerical models for Yucca Mountain. However, the staff review can consider information provided by third parties like yourself in conducting our review of DOE models.

Once again, we appreciate your concern, and we thank you for your technical input. Neil Coleman of the NRC staff has the lead on the staff's review of unsaturated and saturated

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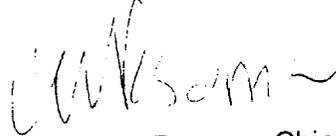
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D. Baker

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zone models. You may reach him by telephone at (301) 415-6615, or by e-mail at [NMC@NRC.gov](mailto:NMC@NRC.gov) if you have any further questions.

Sincerely,



C. William Reamer, Chief  
High-Level Waste and  
Performance Assessment Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: Issue Resolution Status Report,  
Key Technical Issue:  
Unsaturated and Saturated  
Flow under Isothermal  
Conditions, Revision 2.

cc: W. Barnard  
A. Gill

D. Baker

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