UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 8, 1995

Dr. Robert G. Baca, Manager
Performance Assessment Program Element
Center for Nuclear Waste Regulatory Analyses
Southwest Research Institute
6220 Culebra Road
P.O. Drawer 28510
San Antonio, Texas 78228-0510

SUBJECT: REVIEW OF PAPER ON EFFECTS OF FAULTS ON VAPOR TRANSPORT IN CONVECTION SURROUNDING, A HEATED REPOSITORY IN AN UNSATURATED FORMATION: IM 5702-723-550

Dear Dr. Baca:

On April 19, 1995, the Center for Nuclear Waste Regulatory Analyses (CNWRA) transmitted the paper entitled "Effects of Faults on Vapor Transport in Convection Surrounding, a Heated Repository in an Unsaturated Formation." Based on our review, conducted by Rex Wescott and Rose Byrne, it was determined that this deliverable was transmitted on time and is adequate and consistent with the technical direction provided to the CNWRA. Therefore, the transmitted document acceptably meets the requirements of Intermediate Milestone 5702-723-550.

The reviewers commented that this is an excellent paper and there is great potential for this work to be used with NRC efforts to build a simpler PA model and, at the same time, justify the use of more complex modeling where needed. Some of the relationships developed in the areas of fracture flow and thermohydrology can be used with parameter distributions and LHS sampling to determine what fraction of possible realizations could be modeled relatively simply and what fraction would require complex modeling. Insights could also be gained as to what thermal loadings and repository conditions will result in significant reflux. This could aid in the planning of a heater experiment as well as help us comment on DOE's proposed thermal loading strategy. Estimates regarding the likely effects on performance from using simplified rather than complex modeling can also be made. We strongly suggest that work of this nature be pursued and used in a quantitative manner to plan and/or justify future modeling efforts.

One suggestion on improving readability would be to more clearly label parameters and values in Table 1 such as fault flow number, fault gap and fault permeability. Another suggestion, is to submit to NRC a more multi-disciplinary (less esoteric) summary of the results and implications of the work as information for technical people without specialized knowledge in thermohydraulics. This summary need not be permanent part of the paper submitted for publication and would be intended for NRC/CNWRA use only.

TYP-11 Guidance/Manuals
X-Ctr-25
X-IM-12

DF03

If you have any questions regarding the contents of this letter, please contact Tim McCartin at (301) 415-6681.

Sincerely,

/s/

Timothy McCartin, Manager
Performance Assessment Program Element
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

cc: S. L. Fortuna, PMDA
B. D. Meehan, CAB

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