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August 5, 2002
Contract No. NRC–02–97–009
Account No. 20–01402–661

U.S. Nuclear Regulatory Commission
ATTN: Mrs. Deborah A. DeMarco
Office of Nuclear Material Safety and Safeguards
Program Management, Policy Development, and Staff
Office of the Director
Mail Stop 8D–37
Washington, DC 20555

Subject: Programmatic Review of Abstract

Dear Mrs. DeMarco:

The enclosed abstract is being submitted for programmatic review. This abstract will be submitted for presentation at the American Geophysical Union 2002 Fall Meeting to be held December 6–10, 2002, in San Francisco, California. The title of the abstract is:

> "Using Results from the Yucca Mountain Drift-Scale Heater Test to Evaluate Thermohydrological Conceptual Models" by R. Green and S. Painter

Please advise me of the results of your programmatic review. Your cooperation in this matter is appreciated.

Sincerely,

Budhi Sagar
Technical Director

/ph
Enclosures Abstract
NRC Form 390A

cc					
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Using Results from the Yucca Mountain Drift-Scale Heater Test to Evaluate Thermohydrological Conceptual Models

Ronald GREEN, Center for Nuclear Waste Regulatory Analyses (CNWRA), Geohydrology and Geochemistry Group, Southwest Research Institute™ (SwRI®), San Antonio, TX 78238
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The U.S. Department of Energy is conducting a long-term drift -scale heater test (DST) as part of a comprehensive evaluation of a proposed geologic high-level nuclear waste repository at Yucca Mountain, Nevada. The DST completed its four-year heating phase and recently began a four-year cooling phase. Results from the heating phase of the DST are available for evaluating conceptual models used to simulate heat and mass transport at the proposed repository. Conceptualizations of greatest interest include models for multiple continua, fracture representations, constitutive relations, and initial and boundary conditions. Although physical characterization (i.e., property value assignment) is not strictly considered model conceptualization, the values assigned to the model, nonetheless, have a significant affect on model outcome and were included in the evaluation.

A multiphase simulator, MULTIFLO, was used to perform the conceptual model evaluations. Conceptualizations in the model included: two- and three-dimensionality; dual continua (matrix and fracture); matrix-fracture interaction relations; van Genucthen, Brooks-Corey, and linear relative permeability functions; a range of property values (thermal conductivity and fracture permeability); and a broad range of reasonable initial (saturation) and boundary (infiltration) conditions. The evaluations identify which conceptualizations are feasible and consistent with observations from the DST, which model representations are most important for the model to agree with ambient conditions (infiltration, matrix-fracture interaction relations), and which representations are most important for the model to agree with DST heating phase results (fracture permeability and thermal conductivity).

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Using Results from the Yucca Mountain Drift-Scale Heater Test to Evaluate Thermohydrological Conceptual Models

2 AUTHOR(s)
R. Green And S. Painter

3 NAME OF CONFERENCE, LOCATION, AND DATE(s)
American Geophysical Union 2002 Fall Meeting
San Francisco, California: December 6-10, 2002

4. NAME OF PUBLICATION
EOS, Transactions, American Geophysical Union, 2002 Fall Meeting

5. NAME AND ADDRESS OF THE PUBLISHER	TELEPHONE NUMBER OF THE PUBLISHER
AGU Headquarters 2000 Florida Avenue NW Washington, DC 20009	(800) 966-2481

6 CONTRACTOR NAME AND COMPLETE MAILING ADDRESS (Include ZIP code)	TELEPHONE NUMBER OF THE CONTRACTOR
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