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6220 CULEBRA ROAD • P.O. DRAWER 28510 • SAN ANTONIO, TEXAS, U.S.A. 78228-0510
(210) 522-5160 • FAX (210) 522-5155

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Account No. 20-5708-471


U.S. Nuclear Regulatory Commission
ATTN: Philip S. Justus
Office of Nuclear Material Safety and Safeguards
Two White Flint North
Mail Stop 7 C6
Washington, DC 20555

Subject: Modeling Fault-Dike Interaction: Implications for Lateral Diversion of
Dikes and Alignment of Volcanoes in the Yucca Mountain (Nevada) Region
(IM 20-5708-471-760)

Dear Dr. Justus:

The purpose of this letter is to transmit the enclosed report entitled Modeling Fault-Dike Interaction: Implications for Lateral Diversion of Dikes and Alignment of Volcanoes in the Yucca Mountain (Nevada) Region (IM 20-5708-471-760). The manuscript summarizes a diverse suite of analyses for fault and dike interaction in order to illustrate and describe the control of magma ascent by faults. Included are discussions of the geologic record of fault dike interaction at Yucca Mountain, theoretical constraints on fault-dike interaction, analog modeling results, numerical modeling results, *in situ* stress controls, and volcano cone alignment. A contractor report by Integrated Parallel Technology of Pleasanton, California on the "Simulation of Dike Propagation and Deflection by a Fault" is included as an appendix. The report describes a series of computer simulations of dike-fracture extension in an elastic medium to evaluate the hypothesis that an intersecting fault may redirect an upward propagating dike. The computer simulations were performed with DYNA3D, an explicit finite element code for analyzing dynamic response of three dimensional solids and structures.

If you have any questions on this matter, please contact Dr. David Ferrill at (210) 522-6082 or me at (210) 522-5183.

Sincerely,

H. Lawrence McKague
Element Manager
Geology and Geophysics

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