

March 15, 2002

Dr. English C. Percy, Manager
Geohydrology & Geochemistry
Center for Nuclear Waste Regulatory Analyses
6220 Culebra Road
Building 189
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SUBJECT: REVIEW AND APPROVAL OF INTERMEDIATE MILESTONE
20.01402.871.220: "COLLOID FACILITATED TRANSPORT MODELING -
JOURNAL PAPER," DATED FEBRUARY 26, 2002

Dear Dr. Percy:

The Intermediate Milestone "Colloid Facilitated Transport Modeling - Journal Paper," (IM20.01402.871.220) submitted to the U.S. Nuclear Regulatory Commission (NRC) on February 26, 2002, has been reviewed by the NRC staff. This product is programmatically and technically acceptable.

The paper deals with the kinetics of sorption/desorption reactions on colloids as reflected in the title of the manuscript, "Significance of kinetics for sorption on inorganic colloids: Modeling and experiment interpretation issues." The observation that the adsorbed plutonium fraction fails to reach a steady state in the sorption experiments by Lu et al., 1998 and 2000, supports the basis for addressing the issue of extrapolating short-term tests to long-term simulations. The alternative two-site model described in this paper may be useful for interpreting laboratory data suggesting kinetic behavior on widely diverse time scales. This study provides insight into the limitations of short-term tests and may be useful in design of experiments that reveal important parameters affecting radionuclide transport. Furthermore, part of the NRC/Center for Nuclear Waste Regulatory Analyses review effort will include a comparison of the effects on performance and isolation capabilities of various barriers of the two-site model described in this study with that used by U.S. Department of Energy (DOE). Consequently, this study comes at a most opportune time for use in the review of DOE's colloid model in Goldsym.

If you have any questions concerning this review, please contact me at (301) 415-6597.

Sincerely,

/RA/

John W. Bradbury
Program Element Manager
High-Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

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