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July 25, 1984

Enrico F. Conti, Chief  
Waste Management Branch  
Division of Radiation Programs  
and Earth Sciences  
Office of Nuclear Regulatory  
Research  
Washington, DC

Dear Mr. Conti:

This letter and enclosure are in response to your request concerning a brief statement of my views of important issues and major uncertainties regarding the measurements and data needed to establish the geochemical properties for repository sites in basalt, tuff and salt. I have limited the response to chemical parameters measurable in pre-repository rocks or under post-repository far field conditions. It is my understanding that John Apps at LBL has written a statement on near field hydro-thermal conditions.

There are a number of basic research issues that are critical to definition of radionuclide transport that I also didn't cover because they are not directly related to site definition. These include; thermodynamic solubility constants for radionuclides and a number of important zeolite minerals found in basalt and tuff repository rocks, kinetic reaction rates for natural glasses and minerals, models for concentrated electrolyte solutions for brines in salt, and development of coupled models describing fluid and chemical transport. Also I didn't cover isotopic age dating of water which is normally covered under hydrology in the NRC research program.

I hope the issues addressed will be of some value in reviewing the Environmental Assessments from DOE.

Sincerely yours,

Art F. White

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