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

May 22, 1997

MEMORANDUM TO: Michael J. Bell, Acting Chief
PAHL/DWM/NMSS

THROUGH: Keith I. McConnell, Section Leader
PAHL/DWM/NMSS

FROM: Dennis W. Vinson
PAHL/DWM/NMSS

SUBJECT: TRIP REPORT TO YUCCA MOUNTAIN, NEVADA, APRIL 30, 1997

On April 30, 1997, the staff accompanied Commissioner Rodgers on a trip to Yucca Mountain (YM) in order to assess the current state of U.S. Department of Energy's (DOE's) high-level waste (HLW) repository program. The YM site visit included visits to the DOE exploratory studies facility (ESF), various trenches, Fran Ridge, YM crest, the core preparation facility, and the U.S. Geologic Survey (USGS) hydrologic laboratory.

The tunnel boring machine(TBM) broke out of YM six days prior to our visit, completing the south ramp of the ESF. However, it had not yet been removed from the ESF. DOE staff indicated that it would be extracted from the South Portal, by Monday, May 5, 1997.

At Fran Ridge, the large block heater test is being prepared. Heaters have been lodged into the section of tuff in a way that produces a horizontal, planar heat source. The temperature of the rock at the heat source will be increased to a predetermined temperature above the boiling point of water. The top of the large block will be maintained at a constant temperature of 60°C. There are numerous data collecting instruments which will be used to monitor the conditions at various points in the block as the temperature of the heater elements increases above the boiling point and then decreases as the rock is allowed to cool. Data will be gathered to identify the movement of the boiling point isotherm and water as the test proceeds.

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During our visit to the USGS facility, a USGS soil scientist showed us around the laboratory, describing each of the experiments that was underway. In the hallway, just outside the lab were posters depicting the USGS infiltration model. The model was described to us by the soil scientist. The model indicates that the volume of water that passes through the proposed repository footprint could be significantly higher than the 1 to 10 mm/yr which we are currently considering. However, this model is based on the premise that higher infiltration occurs through surfaces with lower soil thickness. This premise may hold true in situations where runoff is not an issue. However, the runoff from YM may be significant and needs to be accounted for in the infiltration modeling.

Future plans for testing/characterization include the drilling of a vertical borehole, through the proposed repository footprint and into the saturated zone below. In addition, the location of the future East-West Drift is currently being considered. A decision concerning its location is expected within the next few months. Based on our conversations with staff at the ESF, it is evident that DOE is planning to purchase the completed East-West Drift rather than purchasing another, smaller TBM and excavating the drift itself. Another test program is being planned by USGS staff that includes sealing off Alcove 1 and monitoring the environment in the absence of ventilation. Some USGS investigators are considering ponding water above the alcove. The alcove would be thoroughly instrumented to reveal the migration of water from the pond through the 30 meters of tuff below and into the drift.

Historically, introduction of organic material into the ESF has been of significant concern. However, considerable amounts of organic material have been and are being deposited in the ESF through degradation of conveyor belts. The impact of this organic material deposition on the performance of the proposed high-level waste repository may need to be considered more carefully, if excavation of the emplacement drifts includes a similar mechanism for removing crushed tuff.

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