



UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD
2300 Clarendon Boulevard, Suite 1300
Arlington, VA 22201

October 17, 2001

Mr. Lake H. Barrett
Acting Director
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
1000 Independence Avenue, SW, RW-2/5A-085
Washington, DC 20585

Dear Mr. Barrett:

Thank you for attending and supporting the Nuclear Waste Technical Review Board's (Board) meeting in Las Vegas on September 10-12, 2001. That the meeting went forward in such a professional manner despite the difficult circumstances caused by the events of September 11 is a tribute to your staff and contractors. The Board appreciates your efforts.

It is clear from presentations at the Board's September meeting and from our preliminary review of *Science and Engineering Report*, *Preliminary Site Suitability Evaluation (PSSE)*, and *Supplemental Science and Performance Analysis (SSPA)* that progress has been made. The amount of work described at the Board's September meeting and the range of analyses conducted by the program in a relatively short time are commendable. We understand that work is continuing in several areas, including uncertainty analyses and corrosion studies.

As you know, the Board will hold a business meeting in late November to begin preparing its comments on the Department of Energy's (DOE) technical bases for a decision on whether to recommend the Yucca Mountain site for repository development. However, the Board's evaluation of the status of the DOE's program, including progress on the Board's four priority areas, will be made more difficult because of gaps in data and analyses. A few key examples of such gaps follow:

Incomplete comparison of high- and low-temperature repository designs. The Board has stated several times that it believes there are significant problems associated with the technical basis for the DOE's base-case repository design, which is a high-temperature design. Because it appears that a lower-temperature design could reduce the significance of some of the uncertainties related to coupled processes and corrosion of the waste packages, the Board recommended that the DOE undertake a comparison of higher- and lower-temperature designs. The DOE's May 30, 2001, letter to the Board indicated that an integrated evaluation and comparison of designs would be completed before a decision on site recommendation is made. This comparison does not appear to have been completed.

Although the *PSSE* suggests that the DOE believes that its repository design can be operated over a range of temperatures, the DOE's plans, if any, to increase its understanding of low-temperature operations are unclear. For example, in general, the analyses in the *PSSE* show little difference in performance and levels of uncertainty between high- and low-temperature operations. This could mean that repository performance and levels of uncertainty are not affected by the repository's thermal regime or that the DOE's performance assessment models are not sufficiently sensitive to show differences between high- and low-temperature regimes.

Questions about the contributions of natural and engineered barriers. In previous "one-off" analyses presented by the DOE, barriers have been "neutralized," (i.e., *individually removed*) to evaluate the performance of the repository system. The Board noted in letters to the DOE dated September 20, 2000, and March 30, 2001, that the neutralization was not consistently defined and suggested that the program conduct an alternative analysis in which barriers would be *incrementally added* to the repository system to determine the contribution of each barrier to overall repository performance. To the Board's knowledge, the DOE has not implemented this suggestion, particularly with respect to the new TSPA carried out as part of the *SSPA*.

Lack of a rationale for going forward in the face of unresolved issues. The disagreements between the DOE and the Nuclear Regulatory Commission's staff and consultants over igneous consequence models seem unlikely to be resolved before the scheduled site recommendation. Thus far, the DOE has not presented a clear and persuasive rationale for going forward with a site recommendation before resolving this important issue.

The DOE asserted at the Board's September meeting that water in the bulkheaded part of the cross-drift was the result of condensation, not seepage. However, no data supporting this conclusion were presented. In addition, we understand that significant amounts of moisture have been found in that portion of the cross-drift within the last two weeks.

To facilitate the Board's November deliberations, we request that you send to the Board as soon as it is available any additional information or letter reports that relate to the issues raised above or to ongoing work that will be completed before a decision on site recommendation is made. If the analyses referred to in the examples cited above will not be available before the DOE's decision is made, we would appreciate receiving the DOE's rationale for why they are not important for site recommendation as well as any plans for subsequently conducting the work if the site is recommended and approved for repository development.

In addition, we encourage additional communication at the staff level in the following weeks to explore details in relevant DOE documents that will aid our understanding of some of the subtleties in the documents. We realize that this may create an additional burden on program staff who are already working at capacity to meet program milestones. However, the Board must have all relevant information before the end of November so that it can adequately review the DOE's technical documents while trying to accommodate the time constraints imposed by the DOE's schedule for decision-making.

Thank you again for participating in the Board's meeting and for your cooperation. We look forward to receiving additional information on the issues raised in this letter and other relevant issues as we prepare for our November review.

Sincerely,

{signed by}

Jared L. Cohon
Chairman

cc: Robert G. Card