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Department of Nuclear Energy

August 17, 1984

Mr. Everett A. Wick
High-Level Waste Licensing Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards
U. S. Nuclear Regulatory Commission
Mail Stop 623-SS
Washington, DC 20555

Dear Mr. Wick:

I have attached a preliminary outline of the work requested in your letter of 8/3/84 to review and comment on specific issues critical to the review of the Environmental Assessments for salt repositories. We understand that our preliminary review will be forwarded to the NRC by August 24, 1984.

There are two issues described in your letter which BNL feels cannot be adequately addressed because of time constraints on the review process and other programmatic commitments. These two areas concern the uncertainties which appear to exist with the temperature calculations (TEMPV5 code) and the radiation profile calculations. The BNL staff believe that these two areas do indeed require careful independent evaluation and verification. I am therefore suggesting that the FY 1985 program in FIN A-3167 specifically include a task to bring these codes in-house for independent evaluation. During the time allotted for the EA review, BNL will comment on the relative importance of these two codes in predicting package performance as well as address the impact of the uncertainties in the predicted values on the package performance.

1121.

Our estimates for completing the work through FY 1984 are $45K (4.5 staff/months). This estimate includes the compilation of a draft data inventory as agreed to in the meeting of 7/17/84. In FY 1985 we suggest an additional $10K (one staff/month) for addressing any outstanding or new issues.

If you have any questions, please contact me or Dr. P. Soo.

Sincerely,

M. Davis

M. S. Davis, Deputy Division Head
Nuclear Waste Management Division

MSD/sb
Enclosure
cc: W. Y. Kato
H.J.C. Kouts
HLW TA Staff
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Docket Control Center (NRC)

Outline of Proposed Work to Address
Critical WP Issues in the Salt EA

A. Boundary Conditions

1. Temperature Calculations in TEMPV5 Document

BNL will review the information presently available. This review will include contacting the appropriate DOE contractor for further information on the code. BNL will indicate where uncertainties are, highlight differences with other calculations, and assess the impact on package performance. It is not possible within the present time constraints and other programmatic commitments to independently evaluate this code or to run a detailed independent comparison with another code. BNL does feel however, that this is an important problem requiring independent NRC work and suggests that it be included as part of the FY 1985 program in FIN A-3167.

2. Brine Composition

Draft documents presently available to BNL will be reviewed and preliminary comments and assessments made by 8/24/84. This task is being undertaken to establish the ranges in anticipated conditions that should be considered in corrosion and release scenarios.

3. Radiation Field

BNL cannot, within the time constraint for this task and current programmatic commitments, independently evaluate the code and predicted profiles. BNL will however contact the appropriate DOE contractor to determine if there is any resolution to the uncertainties in the presently predicted radiation profiles and those predicted in the past. An assessment of the impact of these uncertainties will be addressed within the context of "Near Field Conditions" (B3).

The BNL staff does, however, believe that the uncertainties are large and an independent evaluation of the code should be done. We therefore request, in FY 1985, a specific task under FIN A-3167 to evaluate the code used to predict the radiation profiles.

4. Stresses

BNL will not address stresses developed in the overpack. We strongly suggest however that the NRC independently evaluate this aspect of package behavior.

B. Corrosion Mechanisms and Rates

1. Uniform Corrosion

BNL will examine currently available data on the uniform corrosion of 1025 wrought steel (and similar alloys) in brines under the range of conditions anticipated in a salt repository. A preliminary assessment

will be included in the August 24, 1984 comments to the NRC. It is anticipated, however, that further refinement will be required as more information on near field conditions is developed by NRC geochemists and by further analysis of current literature.

2. Other Failure Mechanisms

BNL will assess the ability of 1025 wrought steel to withstand other failure mechanisms, such as H-embrittlement, in the range of conditions anticipated in a salt repository. Preliminary comments will be issued to the NRC by August 24, 1984.

3. Near Field Conditions

Work done in B1 and B2 will include an evaluation with respect to all potentially important near field conditions including the uncertainties associated with the radiation levels and the temperatures. Preliminary comments will be issued on August 24, 1984.

C. Radionuclide Release and Migration: Solubility, Release Limits and Waste Form Leach Rates

A limited number of independent semi-quantitative calculations will be done to check the data presented in the EA: Table 6-4-16. An evaluation of the DOE arguments will be initiated and preliminary comments issued by 8/24/84 with emphasis on the potential for uncertainties due to changes that may occur as the result of uncertainties in the near field environment.

D. Compilation of Draft Data Inventory for EA Review

Work has been initiated on a compilation of data pertinent to the anticipated performance of waste package materials in a salt environment. This data base will be available by the time the final EA's for salt are submitted to the NRC (approximate date 9/28/84).

8/17/84