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RS-NMS-85-009  
Communication No. 105

U.S. Nuclear Regulatory Commission  
Division of Waste Management  
Geotechnical Branch  
MS-623-SS  
Washington, DC 20555

Attention: Mr. Jeff Pohle, Project Officer  
Technical Assistance in Hydrogeology - Project B (RS-NMS-85-009)

Re: Semi-Annual Update of NNWSI Conceptual Model Report

Dear Mr. Pohle:

This cover letter transmits to the NRC staff Water, Waste and Land's semi-annual update of the NNWSI Conceptual Model Evaluation Report (Subtask 1.4). The report has received a management review by M. Logsdon of Nuclear Waste Consultants.

Since the data base for the site has not materially changed in the last six months, there has been no new developments in the overall conceptual model for the site. Thus, the WWL report is directed at identifying potential problem areas in the local-scale conceptual model proposed by DOE. WWL evaluates information from drill holes USW H-1, USW G-1, USW G-2, and USW UZ-1, focusing particularly on the observation of drilling-fluid contaminated water in USW UZ-1. Since the most likely source of contamination is USW G-1, it appears likely that there is an interconnected fracture network on a lateral scale of at least 300 meters and that the Topopah Springs welded unit is not entirely free-draining. Alternatively, the saturated zone encountered in USW UZ-1 may be the actual water table, not a perched zone, in which case the water-table altitude contours presented by DOE to date are radically incorrect, and there would be a large hydraulic gradient between wells G-1 and UZ-1. Since either of these interpretations would significantly vary from the current DOE conceptual model - and the differences can reasonably be expected to lead to systems which would perform very differently -, detailed information obtained during the drilling of UZ-1 should be obtained, reviewed and evaluated to determine the need for additional characterization of the Topopah Springs welded unit and the water table near UZ-1.

Section 6.0 of the attached report reviews the analyses that WWL considers should be undertaken to evaluate NNWSI conceptual models in a performance framework. WWL considers that the following analyses, first described in the initial Subtask 1.4 Report, should continue:

- o Fracture/Matrix Flow Analysis
- o Capillary Barrier Analysis
- o Analysis of Water Flow in Fractures Affected by Air in the Matrix
- o Vapor Transport Analysis.

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WWL proposes two new analyses in sections 6.1 and 6.2:

- o Analysis of Water Loss in USW G-1
- o Evaluation of Unsaturated Hydraulic Properties for Alternative Fracture Systems

If you have any questions concerning this letter or the attached report, please contact me immediately.

Respectfully submitted,  
NUCLEAR WASTE CONSULTANTS, INC.



Mark J. Logsdon, Project Manager

Att: NNWSI Conceptual Model Evaluation Update, Subtask 1.4

cc: US NRC - Director, NMSS (ATTN: PSB)  
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bc: L. Davis, WWL