Questa Engineering Corporation
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MEMORANDUM

DATE: February 12, 2001
TO: Mal Murphy [malmurphy@home.com]
CC: Danielle Fife **[**dfife@nrff.com]
RE: **SATURATED ZONE FLOW & TRANSPORT AMR Reviews**
Abstraction of Drift Seepage
ANL-NBS-MD-000005

The title of this AMR is self-explanatory. There are a number of real problems with this AMR, including:

1. Section 1, p. 5, paragraph 2. **ALL THE ACTUAL SEEPAGE DATA WERE FROM THE TOPOPAH SPRING MIDDLE NONLITHOPHYSAL UNIT, WHICH COMPRISES ONLY A SMALL PART OF THE PLANNED REPOSITORY. WITHOUT REAL DATA FROM THE OTHER ROCK UNITS, ANY CONCLUSIONS THEY REACH ARE HYPOTHETICAL AND SPECULATIVE**.

2. Section 5, p. 8, assumption 2. **The drift seepage calculations are based on the active fracture model, which I have questioned at length elsewhere**.

3. Section 5, p. 9, assumption 4. **Thermal-mechanical effects were neglected; this is to be checked in TBV #3964**.

4. Section 6.1, p. 10, paragraph 2. The seepage model assumes no drift "degradation" (a euphemism for drift collapse"). Later (Section 6.3.1, p. 21, last full paragraph), they

increased seepage by 55% as an approximate adjustment. Whether this is sufficient is unknown.

5. Section 6.2.2, p. 16, 1st full paragraph. **THE VAN GENUCHTEN α PARAMETER FOR FRACTURES IS BASED ON ONLY ONE "KNOWN" VALUE FOR ACTUAL WATER FLOW DATA FROM THE NICHE 3650 TEST. OF COURSE, THAT IS ACTUALLY A COMPUTED VALUE THAT WAS DEPENDENT ON THE MODEL USED!** Additional seepage testing should be mandatory.

6. Section 6.3.3, p. 22; Section 6.3.3.2, p. 26, paragraph 2. Flow focusing above the drifts is handled as a range of focusing factors. Again, no real knowledge is used. As the AMR says, "The shape of the distribution is speculative, but a log-uniform distribution will be used, as it is appropriate for an uncertain multiplicative factor." Pure poppycock.
