UNITED STATES
NUCLEAR REGULATORY COMMISSION
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April 30, 1998

MEMORANDUM TO: John W. Hickey, Chief
Low-Level Waste and Decommissioning
Projects Branch, DWM

FROM: Michael J. Bell, Acting Chief
Performance Assessment and
HLW Integration Branch, DWM

SUBJECT: REVIEW COMMENTS ON THE DRAFT REPORT ENTITLED "Groundwater Models In Support of NUREG/CR-5512"

As you requested, my staff has completed a quick review of the draft report. The report provides useful insights on the NUREG/CR-5512 modeling approach. As you may be aware, the NUREG/CR-5512 modeling approach is the same approach and serves as the basis for the modeling approach in the DandD screening code. The report is especially useful in identifying limitations of the NUREG/CR-5512 modeling approach and accordingly may be very useful as we develop the Standard Review Plan for Decommissioning. In particular, the report concludes that:

- Use of a single compartment mixing cell model (i.e., the standard NUREG/CR-5512 model) to represent the vadose zone, as proposed in the NUREG/CR-5512 methodology, is inappropriate because it does not adequately represent the effects of variation in the vadose thickness on the calculated dose.

- Use of a multiple-compartment mixing cell model (i.e., the extended NUREG/CR-5512 model) to represent the vadose zone provides a good representation of the vadose zone based on comparison of results with a more realistic model. (This enhancement has been incorporated into the DandD screening code and should be appropriately reflected in the DandD documentation.)

- Both the single and multiple-compartment mixing cell models may be inappropriate for analyses that involve radionuclides whose half-lives are short relative to the vadose zone transit time. These cases could lead to an underestimation of doses. (This will need to be explored further in developing decommissioning guidance.)

- Conditions under which the NUREG/CR-5512 methodology is not appropriate are well defined.

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Based upon a very limited review of the report, staff has the following comments:

- Because the coding for the Standard/Extended NUREG/CR-5512 code predates the DandD code, results from the Standard/Extended NUREG/CR-5512 code should be compared against results from the DandD code to ensure that the NUREG/CR-5512 methodology is properly captured in the coding.

- The extended NUREG/CR-5512 model for a one-meter thick vadose zone should be used for comparison with the STOMP hybrid code instead of using a ten-meter thick vadose zone. This will allow an easier comparison with the comparison between the standard NUREG/CR-5512 code and the STOMP hybrid code.

- The fact that the best match for the CFEST hybrid model for the residential scenario occurs when it is assumed that the well is pumping, may be an indication that the NUREG/CR-5512 ground-water model is not conservative for this scenario. The report needs to further expound upon how best to interpret this result. Similarly, for the drinking water scenario, the best match occurred when the contaminant is completely mixed over the full aquifer thickness; this again may imply that the NUREG/CR-5512 ground-water model is not always conservative. Again, the report needs to explore how best to interpret this result.

- The background discussion on the release criteria should only focus on the release criteria in the new rule. The discussion on the old release criteria and the decommissioning process (including figure 1) should be omitted. This level of detail is not needed.

Please contact Mark Thaggard of my staff if you have any questions regarding the review of the report.

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