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JAN 04 1991

MEMORANDUM FOR: Lawrence C. Shao, Director  
Division of Engineering  
Office of Nuclear Regulatory Research

FROM: Robert E. Browning, Director  
Division of High-Level Waste Management  
Office of Nuclear Materials Safety and  
Safeguards

SUBJECT: REVIEW OF DRAFT REPORT "THE ROLE OF SCIENCE & TECHNOLOGY  
IN ADDRESSING KEY NATIONAL GROUND-WATER ISSUES"

This communication is a response to your memorandum dated December 14, 1990 requesting a review of the subject document. Neil Coleman of the Hydrologic Transport Section has reviewed chapters 4 and 6 of the subject document. This memorandum documents the comments we discussed with Tom Nicholson on December 20th.

Chapter 6 of the draft report describes policy and technical issues in nuclear waste disposal. We are concerned that terminology used in this section is not consistent with NRC's regulations on civilian high-level waste disposal. For example, on page 6-2 one of the major policy issues is stated "To ensure that environmental standards can be met." Rather than using the word "ensure", 10 CFR 60.101(a)(2) calls for "reasonable assurance, making allowance for the [long] time period, hazards, and uncertainties involved...." The theme of reasonable assurance should be reflected throughout the document wherever civilian high-level waste disposal is concerned. Examples of text that should be re-evaluated are given in the attachment. One way to address our comment would be to add a discussion about reasonable assurance to the introductory section on nuclear waste disposal (pages 1-4 and 1-5).

We recognize that the draft report is an interagency document of broad scope produced by a committee of authors. Our concern about regulatory terminology arose because the report does not describe the differing regulations that govern disposal of various types of wastes. Principal waste types include hazardous wastes, high- and low-level radioactive wastes, mixed wastes, and defense wastes. The authors will need to re-evaluate the draft report to determine if clarifications may be needed in regulatory terminology affecting other types of wastes.

Another concern is that research priorities on pages 6-5 through 6-7 show hydrology and hydraulics as a second priority and transport and fate of inorganic chemicals as first priority. In our view, hydrologic transport is a fully coupled flow and transport process, and it may be inappropriate to arbitrarily assign priorities that differentiate between hydrology and transport. Research priorities 1 and 2 should be combined under the heading "1. Hydrologic Transport and Fate of Inorganic Chemicals (1st Priority)." //

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Please contact Neil Coleman (20530) or David Brooks (23457) if you have any questions about this document review.

**Original Signed by  
Robert E. Browning**

**Robert E. Browning, Director  
Division of High-Level Waste Management  
Office of Nuclear Materials Safety  
and Safeguards**

**Attachment: As stated**

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Specific Comments on Draft Report

Page 6-8: Changes are needed in Figure 6-3, which lists processes and parameters to be considered in site characterization and modeling. Under "Water Table," recharge and steep gradients are listed. For the water table system, information is also needed about flow paths in fractured, saturated rocks, including hydraulic properties and geochemical conditions in both fractures and rock matrices. Also in Figure 6-3, an additional parameter should be added under precipitation. The needed parameter is the areal variation in precipitation during storm events.

The following excerpts from the draft document (which are related to civilian high-level radioactive waste) are examples of terminology that is inconsistent with 10 CFR 60. Terms like "ensure" and "confirm" are used in the document. However, 10 CFR 60.101(a)(2) calls for "reasonable assurance, making allowance for the time period, hazards, and uncertainties involved...". This should be addressed in the document as discussed in the cover memo.

Examples of Terminology to be Reconsidered

Page 1-4, policy issues 1 and 2:

- "1. To ensure that radioactive waste can be safely disposed below ground"
- "2. To ensure that environmental standards can be met"

Page 6-2, first line:

- "2. To ensure that environmental standards can be met..."

Page 6-2, paragraph 3, first line:

- "A critical issue is to confirm that these new environmental standards..."