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Ms. Wendy Melgin, Staff Officer
Water Science and Technology Board
National Research Council
2101 Constitution Avenue
Washington, DC 20418

SEP - 6 1980

Dear Ms. Melgin:

Thank you for the opportunity to comment on Ground Water Models: Scientific and Regulatory Applications. I found the document on the whole stimulating and technically on the mark. However, I found that the first section of Chapter 5 dealing with NRC programs, particularly the low-level waste program on which much of the discussion was based, could be improved.

First it should be realized that there are two waste management (disposal) regulation programs at NRC that have different regulatory requirements and therefore different programmatic needs. This could best be dealt with by organizing the section into two subsections, a low-level waste section and a high-level waste section. Also, the report could benefit from brief mention of models in planning for clean up under the UMTRCA Title I remedial action program and the recent facility decommissioning rule. These areas are rapidly developing at this time.

I have provided detailed comments on the first part of Chapter 5 and hope that they will be of use. In addition I have attached three documents that may help you understand the NRC program related to demonstration of compliance with applicable regulations and standards as it is developing at this time. I also would suggest that a summary of issues in Chapter 6 and the research needs defined in Chapter 7, best in extended tabular form, would be of much use to the manager developing policy and looking to this document for direction.

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Ms. Wendy Melgin

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This document contains a great deal of useful information and reflects significant effort on the part of the Committee. It will provide important input to the planning for future work in groundwater modeling for standard setting and compliance demonstration. Many of the concepts and issues explored in the document apply to modeling of other exposure mechanisms, such as air transport, as well as the groundwater pathway. If I may be of any further help please contact me on (301) 492-0589.

Sincerely yours,

Original Signed By

Dr. R. John Starmer, Section Chief
Division of Low-Level Waste Management
and Decommissioning, NMSS

Enclosures:

1. Comments on "Ground Water Models..."
2. "Performance Assessment Strategy for Low-Level Disposal Sites"
3. "Selection and Integration of Models..."
4. "Identification and Recommendation of Computer Codes..."

cc: D. Chery, NRC
T. Nicholson, NRC

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Ms. Wendy Melgin

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SUBJECT ABSTRACT:

OFC :LLTB <i>RJS</i>	:LLTB	:LLTB	:LLWM
NAME:RStarmer/lj	:	:	:
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Review Comments -- Ground Water Models: Scientific and Regulatory Applications

CHAPTER 5

1. These three sentences taken together are not clear, particularly with reference to later discussions. Later discussions of detailed procedures pertain to low level waste disposal. What submittals are referred to -- HLW or LLW?
2. Generally, this discussion would benefit from a clear separation into a low-level waste part and a high-level waste part. The two areas have different standards and approach the use of modeling to demonstrate compliance with standards in different ways. Attached is a copy of a staff paper on modeling the performance of a low-level waste disposal site prepared by me and my staff. I know of no similar document for high-level waste disposal performance assessment modeling but you might contact Mr. Seth Coplan at 492-0410 to see if a similar document exists.
3. The requirement cited is for low-level waste disposal only. The State of Washington has recently completed relicensing the Richland facility and required performance assessment modeling including groundwater modeling and assessment of the groundwater exposure pathway. NRC staff is currently reviewing a simulated license application prepared for the DOE Low-Level Waste Management program by a contractor. The result of the review will be published to help prospective licensees understand the requirements for licensing a low-level waste disposal facility.
4. Many States require engineered structures--this statement is not up-to-date.
5. Reference on page 339 is not cited correctly.
6. These two sentences are not quite right. The first should reference 10 CFR Part 61, which is the codification of the requirement not a staff guidance document. The purpose of the requirement is more extensive than implied by the second sentence and the author might consider quoting the three paragraph statement of purpose from page 5 of NUREG-0902.
7. Reference on page 340 is not correct.
8. Details of information requirements are provided the applicant in the Standard Format and Content document, NUREG-1199, and in SRP sections 2.2 Meteorology and Climatology, 2.4.2 Groundwater Characterization, and 3.1 Principal Design Features. While the adequacy of these specifications may be a matter of discussion, the sentence as written appears to be incorrect.
9. NRC has never specified codes for use in low-level waste disposal performance assessment work, considering that this is generally a problem specific matter. The staff has had available

a suite of codes which included a spectrum from simple one-dimensional transport codes to complex 3-dimensional finite element codes to handle flow and transport. Staff has been available to discuss code applications for specific problems. Recently, staff contracted with Sandia National Laboratory to systematically assess overall performance assessment modeling needs for low-level waste disposal, determine current state of the art and provide recommendations to NRC on suitable codes for implementation. As the project progresses, information has been shared with State regulators and developers. An advanced, pre-print of the Sandia report is attached.

10. The paragraph does not in my opinion reflect the contents of SRP Section 3.2.4 or the spirit of the review process described therein. The quoted sentence fragment is not an example of clear concise regulatory writing and taken out of context could mean almost anything, however the meaning attributed to the fragment by the author is not correct. The license applicant could provide a simple conservative analysis which demonstrates compliance but would need to demonstrate that the simple conservative analysis was indeed a reasonable representation of the site and facility behavior. This demonstration would need to be based on detailed information about the site. In addition, it is considered possible that a simple conservative analysis can not be used to demonstrate compliance and that more detailed analyses will be required. In no place are "overly conservative" analyses advocated for either applicant or regulator and the "use of unrealistic data" is not mentioned in the NRC document. Conservative data is NOT a priori unrealistic data! I quote from a recent (Jan. 27, 1989) management position which addressed, among other matters the concept of conservatism, in this case with reference to design basis events and design criteria. "For well known or accepted parameters with narrow empirical distributions or very narrow ranges, expected values should be used as appropriate. For less well known parameter, such as those estimated based on little empirical data or with broad distributions, conservative values should be chosen from within the observed distribution or estimated range. Extreme values should not be used." I think that the author should reconsider this paragraph, if as I suspect, it is meant to address that matter of conservatism and how it is handled by NRC reviewers.

11. The indicated part of the paragraph seems a little soft. Modeling is required by regulation as part of the site and facility qualification process and is incorporated in the review process. The place of conservatism is recognized by NRC but is not, in my opinion, emphasized. We do emphasize site characterization as a critical part of the site qualification process.

12. The following discussion, to the end of the section, appears to be directed toward the HLW program and should be attributed to that program to avoid confusion--particularly considering the immediately preceding sentence. The following is not well referenced, also leading to some confusion. I have highlighted a couple of phrases that are not clear to me.