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MEMORANDUM FOR: Malcolm R. Knapp, Branch Chief  
Geotechnical Branch  
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FROM: R. John Starmer, Section Leader  
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David J. Brooks  
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*WM-RES*

WM Record File *B-0287* WM Project *10, 11, 16*  
*B-0290* HLW Docket No. \_\_\_\_\_  
PDR   
LPDR *B, N, S*

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SUBJECT: TRIP REPORT FOR ORNL MEETING - NOVEMBER 14 & 15, 1985

A meeting between NRC Project Managers and Oak Ridge contractors associated with B0290 and B0287 was held at ORNL on November 14-15, 1985. The purpose of this meeting was to allow John Bradbury, the new Project Manager for B0290, to meet his contractors and become familiar with the experimental and analytical equipment and procedures used in B0290 and to discuss progress and plans for both the B0287 and B0290 contracts. A copy of the meeting minutes reported by S. D. Whatley, the Oak Ridge Project Manager for B0290 and B0287, is attached.

During the meeting, it was agreed that for B0287, in FY85, emphasis would be placed on reviewing and writing evaluations of the more than 700 documents received from the DOE sites. To date, only a small percentage of these documents have been evaluated. In addition, under B0287, ORNL will continue working on draft topical reviews on Geochemical Conditions and Reactions, Radionuclide Sorption, and Radionuclide Solubility for HLW repositories in basalt and tuff, Matrix Diffusion in tuff, and Geochemical Conditions and Reactions in salt.

It was agreed that for B0290 the emphasis of the experimental work will be shifted from BWIP related conditions to NNWSI conditions. Discussions centered

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around experimental sorption methodologies applicable to unsaturated media and the composition of groundwater in the unsaturated zone. In addition, following a review of the chemistries of americium and plutonium, the experimental studies may be expanded to include these two radionuclides.

Original Signed By

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See Folder 20, 10  
11-28-84  
MR-3.4  
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MEETING REPORT

AUTHOR: S. K. Whatley

LOCATION AND DATE: ORNL, November 14-15, 1984

PURPOSE: B0287 and B0290 Project Review

PROJECT TITLE: Technical Assistance in Geochemistry (B0287) and Laboratory Evaluation of DOE Radionuclide Solubility Data and Selected Retardation Parameters, Experimental Strategies, Laboratory Techniques, and Procedures (B0290)

PROJECT MANAGER: S. K. Whatley

ACTIVITY NUMBERS: ORNL #41 37 54 92 4 (189 #B0287) NRC #50 19 03 1  
ORNL #41 37 54 92 6 (189 #B0290) NRC #50 19 03 1

PARTICIPANTS:

ORNL J. T. Bell, Chemical Technology Division  
A. D. Kelmers, Chemical Technology Division  
F. G. Seeley, Chemical Technology Division  
S. K. Whatley, Chemical Technology Division  
W. D. Arnold, Chemistry Division  
J. G. Blencoe, Chemistry Division  
R. E. Meyer, Chemistry Division  
G. K. Jacobs, Environmental Sciences Division  
S. Y. Lee, Environmental Sciences Division

NRC J. W. Bradbury, NMSS  
D. J. Brooks, NMSS  
R. J. Starmer, NMSS

AGENDA: See Attachment 1

MEETING OBJECTIVE:

The primary objective of the meeting was to introduce J. W. Bradbury, new Project Manager for the B0290 project, to the ORNL technical staff and familiarize him with the laboratory facilities, techniques, and procedures being utilized in the B0290 project. In addition project reviews were conducted and the work plans were discussed for both B0287 and B0290.

SUMMARY:

The first morning of the two-day meeting consisted of presentations by the B0290 technical staff (see attachment 2). The format was kept informal to allow maximum interaction between the ORNL staff and the new NRC Project Manager. The

afternoon was a continuation of informal discussions in the various laboratories in the three divisions. The second day was devoted to discussing the B0287 project and future directions for both projects. The meeting was extremely productive for both NRC and ORNL staff.

In addition to meeting the staff, Bradbury had an opportunity to better understand the details of the laboratory experiments and obtain more detailed answers to the questions he had raised earlier. It is hoped that meetings such as this will continue on a routine basis since the success of these two projects is contingent on a good working relationship between NRC and ORNL. The NRC continues to express satisfaction with the direction and accomplishments of these projects.

The need for a data review at both the Hanford Site and the Yucca Mountain site in the near future was also discussed during the meeting. ORNL will furnish NRC a list of those items that we think should be covered in the reviews.

#### B0287 - Technical Assistance in Geochemistry

The draft copy of the B0287 work plan was reviewed and a tentative schedule for topical reviews was agreed upon. Dave Brooks, NRC Project Manager, will furnish detailed comments on the work plan in the near future and ORNL will issue the FY 1985 work plan. At present, ORNL currently has responsibility for the following topical reviews:

BWIP	Geochemical Conditions and Reactions Sorption Solubility
NNWSI	Geochemical Conditions and Reactions Sorption Solubility Matrix Diffusion
Salt Sites	Geochemical Conditions and Reactions

NRC will be responsible for writing the topical review on Brine Migration for the salt sites and ORNL will review the report. In addition ORNL will provide input to and review the site technical positions being written by NRC. It was agreed that issuance of the BWIP solubility, the NNWSI matrix diffusion, and the salt geochemical conditions reports would have first priority for FY 1985 (the schedule will be finalized in the work plan). The receipt of the EAs and/or the SCPs could impact due dates set for these reports.

The NRC Project Manager indicated that he found the technical content of the draft BWIP solubility report to be representative of what is appropriate for these reports. It was agreed that the topical reviews should be technically oriented and not contain materials related to the NRC's position on licensing, etc. The sections on adequacy of information and recommendations will be combined into one section.

As a result of the B0290 discussions, it was agreed that ORNL would also consider issuing topical reviews on americium chemistry and plutonium chemistry as time and staff permit. Colloid formation could be a problem with americium experiments and plutonium chemistry is not well understood.

No firm work plans were formulated on areas of responsibility for review of the EAs and SCPs since firm dates for receipt are not known. Tentative dates of December 1984 for the EAs and September 1985 for the SCPs were mentioned.

During FY 1985, emphasis will be placed on reviewing and writing evaluations of the documents being received from the DOE sites. At present only a small percentage of the >700 documents have been evaluated. Evaluations have only been written on the documents considered key for the topical reviews. The NRC Project Manager will investigate the possibility of evaluations being forwarded from reviewers other than ORNL technical staff for input into the data base (e.g., recent evaluation by NRC staff member was used as input).

B0290 - Laboratory Evaluation of DOE Radionuclide Solubility Data and Selected Retardation Parameters, Experimental Strategies, Laboratory Techniques, and Procedures

To date this project has focused on data published by BWIP, but emphasis will be shifted to NNWSI in the near future. Samples of tuff materials and J-13 well water are expected at ORNL early in 1985. In anticipation of receipt of these samples, the technical staff has begun to discuss potential work areas using these materials. Two key areas of concern were discussed during the meeting: 1) methodology for experiments in unsaturated media and 2) groundwater composition in the unsaturated zone. All the work published by NNWSI has been with saturated zone water and much of the published work has been with Sr, Ba, and Cs which are not key radionuclides.

In reviewing the status of our BWIP work, the following items were identified as needing addressing in the future:

1. ORNL has not evaluated the Pu data published by BWIP since the methodology for preparing and characterizing Pu in groundwater has not been published. A data review is needed at BWIP to ascertain this information prior to evaluation. Since Pu chemistry is not well understood, ORNL (as time and staff permits under the B0287 project) will do a letter report on status of Pu chemistry.
2. ORNL has not evaluated the current experiments being conducted by BWIP in the flow-through, high temperature, high pressure autoclaves because we do not have the appropriate equipment. NRC/ORNL will have to assess the relevance/importance of the data from these experiments.

The sample characterization work done on the BWIP samples has been extremely helpful in understanding the sorption results obtained with the various basalts. It is hoped that characterization of the tuff samples received from NNWSI will be provided with the samples. A decision on whether additional characterization will be necessary will be made subsequent to receipt of the materials.

As reported during the presentations, the EQ3/EQ6 computer code is being installed on the ORNL computers. Subsequent computer work will be directed at maintaining a working knowledge of the codes. The codes will be used, as appropriate, to compliment our evaluations and to confirm selected site data. After the EQ3/EQ6 computer code is on-line at ORNL, staff members may visit NRC headquarters to discuss the codes with their NRC counterparts.

To date the primary emphasis has been placed on the batch experiments with secondary emphasis being placed on the computer codes and the column evaluations. It was pointed out to the NRC Project Manager that the present level of funding was not sufficient to accomplish the multiple speciation tasks that had been planned for the columns. While ORNL still thinks these experiments would provide valuable insight to radionuclide migration, more funding would be necessary to accomplish this task. The FY 1985 funding level is insufficient to keep a core group functioning in the batch experiments, the column experiments, and the computer modeling areas (the FY 1984 funding was marginal for all these areas). At present, NRC has indicated that the batch experiments are the first priority with the modeling secondary. Plans have been made to discontinue technical staff support for the column work (including materials characterization). Evaluations in these areas will be on an "as needed" task assignment rather than continuous personnel support.

Agenda

B0287 and B0290 Project Review

November 14, 1984 - morning

Room 246, Building 4500N

Discussion of B0290 Project

- Introduction and summary of progress A. D. Kelmers
- Technetium/Neptunium Reactions (MRS talk) R. E. Meyer
- Sample characterization S. Y. Lee
- Modeling activities G. K. Jacobs

Discussion of B0290 Work Plan

- Prioritize activities
- Review future directions

November 14, 1984 - afternoon

Laboratory Tours

November 15, 1984 - morning

Room 246, Building 4500N

Discussion of B0287 Project

- Topical review content
- Topical review schedule
- Data Base
- Future DOE/NRC workshops
- EA and SCP schedules
- Review draft Work Plan

November 15, 1984 - afternoon

Room 246, Building 4500N

Wrapup