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JUN 29 1982

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MEMORANDUM FOR: Malcolm R. Knapp  
High-Level Waste Licensing  
Management Branch  
Division of Waste Management

FROM: Ellen J. Quinn  
High-Level Waste Licensing  
Management Branch  
Division of Waste Management

SUBJECT: TRIP REPORT

Attached is the trip report for my trip to Seattle, WA and Richland,  
WA on June 7-18, 1982.

ORIGINAL SIGNED BY

Ellen J. Quinn  
High-Level Waste Licensing  
Management Branch  
Division of Waste Management

Enclosure:  
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### Trip Report

**Dates:** June 7 - June 18, 1982

**Locations:** Seattle and Richland, WA

**Purpose:**

- 1) To participate in the meetings with Rockwell on progress of the plans for underground testing; and
- 2) To attend the International Sorption Information Retrieval System Symposium.

#### Hanford Meeting:

Rockwell discussed the plans for borehole drilling during the site investigations. The testing schedule extends over 4-5 years and drilling on this phase of work has already begun. The principal emphasis will be characterizing the repository location area, an area approximately four miles in diameter. Five new holes are planned for this area and will concentrate data collection on the Umtanum layer. The decision for the location and amount of data taken in these holes is based on a recent RHO data evaluation which attempts to compare current confidence levels on parameter estimates to those necessary for adequate site understanding. It is unclear what the standard of comparison results from since a model sensitivity analyses has not been conducted. According to their review, additional data are needed for all three formations in the reference repository location but not in the region.

The exact levels which will be tested in each hole, though requested, were not discussed. This information will be forthcoming in their drilling and testing program report, which will be released in October. However, some general information was received:

DC 16 will be used as the control well for the "cluster testing" south of the RRL.

DC 17 west of the RRL will be used to test the potential hydrologic barriers associated with the Olympic Wallawa lineament. It will be used in association with DC 4-5 for the cluster test.

DC 18 will be used to investigate the flow in the vicinity of the Gable Mountain anticline.

The group of holes DB 11, McGee and O'Brien have already been used to examine the effects of the O-W lineament in the upper portions of the section. The results of these studies have not been released and no planned release date was given.

Several documents are associated with each of the borings:

- A borehole completion report
- A data objective report
- Preliminary information in the quarterly reports

The characterization plan will probably provide a reasonable level of information in the reference repository locations. However, by concentrating on this area, the debate in the far field will remain

unresolved. The largest gap will be in head data for this area. Since all of the new holes are in a small region, it will be hard to use this information to adequately calibrate the far field model. This issue may become important if the current flow path is used as the basis for most sensitivity analyses.

### Exploratory Shaft

The detailed plans for this phase of work have not yet been developed. However, RHO did have some general information about plans for the test facility. The work will occur in two phases. Phase I will principally test the ability to construct shafts and structures in the rock while Phase II will collect data at depth. The data collected will include information about hydrologic and geomechanical properties. Results of both phases of work will be completed before construction authorization and will be input to the license application.

The shaft is anticipated to take 6 months to construct. No hydrologic information will be collected as the shaft is drilled. Portholes will eventually be constructed to assess the damage resulting from the shaft. Significant damage is not expected to be present more than 10 feet from the shaft. Shaft inflow is expected to be less than 10 gallons per minute. The plans will tolerate values below 200 gallons per minute.

The exact number and type of tests to be conducted at the bottom of the shaft have not been determined. The principal parameters of interest were vertical permeability, rock strength and in-situ stresses. The principal problem will be prioritizing these tests given the limited time, area,

and resources. To date, little emphasis has been placed on deciding practically which tests can be finished in a reasonable amount of time.

#### ISIRS

The purpose of ISIRS is to develop the data base for sorption and solubility information which can be used for modeling analysis. To perform this task, data must be collected from various laboratories and the software necessary to process the data must be developed.

The work is being conducted at PNL. Previously, it was funded exclusively by ONWI. Since 1980 the work has been jointly funded by the eleven countries including the U. S. who intend to use the results in their modeling studies. The software development is nearly completed. The data base uses PNL's Analyses of Large Data Sets (ALDS) system to describe the data. Statistical and graphic capabilities are provided by MINITAB, ARTHUR, and RUMMAGE. The data base will be transferred to some of the other groups at the end of FY83.

The data base presently contains approximately 2000 Rd values. The size is expected to double in the next year. One of the principal problem is getting the laboratories to submit their data. The coding form associated with each measurement is quite extensive and no funds are allocated for filling in forms. The investigators are currently attempting to gain increased cooperation from the laboratories.

The data base has several features which would make it useful for performance assessment. The data can be selected by many different criteria including radionuclide, rock type, groundwater composition or

even laboratory investigator. A knowledgeable selection would insure that the models contained the value which best characterized the site being modeled. Use of the statistical package would allow extrapolations to be made from the data. This could provide a Kd "predictor" over a very limited or very general range depending on the requirements of the problem. The current constraint is that there is no information on either basalt or tuff in the current data base. PNL hopes that this information will be incorporated this year. In the interim some of the data on mineral types, particularly the clays, might be useful to obtain.

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MEMORANDUM FOR: Malcolm R. Knapp  
High-Level Waste Licensing  
Management Branch  
Division of Waste Management

FROM: Peter M. Ornstein  
High-Level Waste Licensing  
Management Branch  
Division of Waste Management

SUBJECT: TRIP REPORT - UNSATURATED FLOW SYMPOSIUM AND AEGIS PROGRAM

Purpose: Attend NRC sponsored symposium and confer with PNL staff on status of AEGIS program.

Date: March 22-24, 1982

Attendees: Refer to attached list.

Place: Battelle's Offices; Seattle, WA; and Richland, WA

The NRC sponsored Seattle symposium presented a unique opportunity to discuss unsaturated flow and transport modeling programs with DOE contractors, NRC contractors, private industry, and academia. Papers presented at the symposium discussed a variety of issues at a highly technical level, but only a few had any potential application for high-level waste disposal.

At the symposium, I met with Lynn Tyler of Sandia National Laboratory (SNL) to discuss the DOE Performance Assessment program for the Nevada Test Site. Tyler is supervising the SNL PA program under NNWSI (Nevada Nuclear Waste Storage Investigations) and therefore will be coordinating all PA activities for DOE at NTS. Also under NNWSI and feeding the SNL PA program is Los Alamos National Laboratory, Lawrence Livermore Laboratory, U. S. Geological Survey, and other SNL contracts. Several codes, both saturated and unsaturated were mentioned for possible use at

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NTS, but all are being subject to extensive SNL modifications. The NTS PA program is just getting started and will not have significant input into the upcoming SCR. Just where the USGS modeling effort fits into the SNL program is not yet clearly defined.

Bill Wilson of the USGS was also attending the symposium and was hesitant to talk about making data more accessible to the NRC. When asked if he felt if it would be appropriate for NRC staff to stop off in Denver (on return from the upcoming NTS site visit) to look over USGS data, he avoided response. He had, however, previously mentioned that raw uninterpreted field data was by law open to the public, but the USGS felt any interpreted data should be released only in final publishable form.

Meetings with PNL in Richland consisted of sitting in on a WMLL contract meeting and discussing th AEGIS program with R. W. Nelson. The WMLL contract (FIN B-2220) in some areas overlaps the WMHL benchmarking contract (FIN B-6985). Both contracts include descriptive summaries of unsaturated flow codes (if DOE locates a high level repository in the unsaturated zone) and comparison of code results to a predetermined solution. A complimentary relationship should be worked out between the two contractors so that redundant effort is avoided and final products mesh harmoniously in format and content.

My discussions with R. W. Nelson pertained primarily to the AEGIS program. Nelson is a PNL research hydrologist assigned to the AEGIS program. At the close of FY82, DOE will cease funding of the AEGIS program. A possible explanation given by PNL is that DOE is placing emphasis on site specific PA programs rather than on a generic one. How the SCEPTRE program will be affected is not known. Also, it was not clear to PNL staff whether certain current AEGIS projects (i.e., the Geologic Simualtion Model of NTS) will be funded through completion or be terminated with the rest of the program. PNL seems anxious to continue all avenues of research and development initiated under the AEGIS program and would entertain funding from the NRC or other sources (e.g., EPRI will continue funding the work being performed in uncertainty analysis).

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Currently, the AEGIS program just concluded a modeling study (in press) of the Paradox Basin which illustrates the utility of kriging and the Geohydrologic Response Function as predictive and summary tools.

ORIGINAL SIGNED BY

Peter M. Ornstein  
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Enclosure:  
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