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MEMORANDUM FOR: Hubert J. Miller, Chief  
High-Level Waste Technical  
Development Branch  
Division of Waste Management

FROM: Robert J. Wright  
High-Level Waste Technical  
Development Branch  
Division of Waste Management

SUBJECT: DOE/NRC WORKSHOP ON GEOLOGY AND GEOLOGIC STABILITY  
APRIL 11-15, 1983

Attached are the meeting notes on the above workshop.

~~"CONFIDENTIAL SIGNED BY"~~

Robert J. Wright  
High-Level Waste Technical  
Development Branch  
Division of Waste Management

Attachment:  
Meeting Notes

cc: Mark Frye, DOE-HQ, w/attachment  
O. L. Olson, DOE-HQ, w/attachment

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DOE/NRC Workshop  
Geology and Geologic Stability  
April 11-15, 1983

A geology - geologic stability workshop and field trip was held at Hanford, Washington from April 11 through 15. Five members of the NRC WMHT staff attended with four consultants representing Lawrence Livermore National Laboratories, the U. S. Army Corps of Engineers and the U. S. Bureau of Mines. A list of participants, the agenda, a copy of the meeting notes prepared at the conclusion of the five day workshop, and a "Review of Drill Hole Logs and Core" are attached.

Highlights of the trip included the two days spent reviewing the logs (geologic and geophysical), shift reports, color photos of core and selected intervals of core for core holes RRL-2, RRL-6 and RRL-14; an overflight of the Hanford reservation and surrounding area; and a full day field trip of the Emerson Nipple and Vantage area. The overflight and the field trip gave the NRC staff and consultants a valuable perspective into the geology and geologic stability investigations conducted by the BWIP investigations.

A number of specific comments were presented to DOE by the NRC staff at the end of the five day meeting.

- o As expressed in NUREG 0960, there is a need for overall plans to address: (a) seismic risk and tectonic stability and (b) significant interflow structures in key horizons between the repository and the accessible environment. Some elements of such plans were discussed. NRC would like to work toward an exchange of ideas on such overall plans as soon as prepared.
- o RHO-BW-SA-269-P "The Impact of Seismicity on the Stability of an Underground Repository" by N. H. Rasmussen and A. C. Rohay, appears to be an important contribution to the methodology for evaluation of possible seismic damage to a repository. NRC staff and consultants will study the document and will comment on it to DOE/BWIP.
- o A detailed regional tectonic map, which includes data developed by the Corps of Engineers, WPPSS power plant investigations and data that exists in the literature from studies by other

competent investigators, along with analysis and evaluation, is needed to supplement material presented in RHO-BW-ST-19-P (draft) "Preliminary Interpretation of the Tectonic Stability of the Reference Repository Location, Cold Creek Syncline, Hanford Site" edited by J. A. Caggiano and D. W. Duncan.

- o The proposed seismic surveillance system in place now and planned for this fiscal year as outlined on page 31 of RHO-BWI-SA-178 "Seismic Studies at a Potential Deep Nuclear Waste repository Within the Columbia River Basalt Group, Pasco Basin" by N. H. Rasmussen and A. C. Rohay is a good system for investigating the hypocenters and focal mechanisms of the seismic events occurring in the Pasco Basin.
- o Excellent work is being done in local structural geology and dating of geologic events. However, consideration of a larger study area is necessary to provide the framework that is needed for an understanding of the local picture. The work accomplished by other investigators, such as the WPPSS WNP-2 powerplant studies, within the Pasco Basin and surrounding area, should be assessed and incorporated as appropriate.
- o Maximum credible earthquakes should be established for each seismogenic structure and region that could affect the site and the appropriate ground attenuation to the site, should be specified. This is an essential part of the seismic design basis that will be needed for a repository.

A number of comments (see attached meeting notes) were given to DOE concerning our review of the RRL-2, RRL-6 and RRL-14 borehole data. These comments are detailed in the "Review of Drill Hole Logs and Core," attached.

Information presented by DOE and reviewed by the NRC staff and consultants that lead to the above comments include:

- o The drill information on RRL-2, RRL-6 and RRL-14: geologic logs, shift reports, geophysical logs (caliper, sonic, density and neutron), color photos of core, and selected core.
- o The planned seismic surveillance system (Presentation by Dr. A. Rohay)

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- o The proposed method for evaluating possible seismic damage to a repository (RHO-BW-SA-269-P)
- o Geologic features in the Pasco Basin and surrounding area in the field by air and ground, including the site for the evaluation of tectonic breccias.
- o The plans for the investigation of the Nancy linear and the Yakima hydrologic barrier.
- o The seismic refraction program and the plans for reprocessing a portion of the seismic reflection program.

See previous concurrences

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