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September 9, 1985

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Dr. J. W. Bradbury
Geotechnical Branch
Office of Nuclear Material
Safety and Safeguards
U.S. Nuclear Regulatory Commission
Room 623-SS
Washington, D.C. 20555

WM-RES
WM Record File
B0290
ONE

WM Project 10, 11, 16
Docket No. _____
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Dear John:

Enclosed is the progress report for the month of August 1985 for B0290, "Laboratory Evaluation of DOE Radionuclide Solubility Data and Selected Retardation Parameters, Experimental Strategies, Laboratory Techniques and Procedures."

Sincerely,

Susan K. Whatley, Manager
Repository Licensing Analysis
and Support
Chemical Technology Division

SKW:bek

Enclosure

cc: Office of the Director, NMSS (Attn: Program Support Branch)
Division Director, NMSS Division of Waste Management (2)
M. R. Knapp, Chief, Geotechnical Branch
K. C. Jackson, Geotechnical Branch
D. J. Brooks, Geotechnical Branch
Branch Chief, Waste Management Branch, RES
C. Hackbarth, Waste Management Branch, RES

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A. D. Kelmers
D. C. Kocher
A. P. Malinauskas
R. E. Meyer
R. G. Wymer
SKW File (2)

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PDR WMRES EXIORNL
B-0290 PDR

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MONTHLY PROGRESS REPORT FOR AUGUST 1985

PROJECT TITLE: Laboratory Evaluation of DOE Radionuclide Solubility Data and Selected Retardation Parameters, Experimental Strategies, Laboratory Techniques, and Procedures

PROJECT MANAGER: S. K. Whatley

TASK LEADER: A. D. Kelmers

SCIENTIFIC STAFF: W. D. Arnold, J. G. Blencoe, G. K. Jacobs, and R. E. Meyer

ACTIVITY NUMBER: ORNL #41 37 54 92 6 (FIN No. B0290)
NRC #50 19 03 1

PROGRESS HIGHLIGHTS:

HANFORD SITE INFORMATION EVALUATION

Radionuclide Sorption/Solubility Values:

As reported last month, we have begun sorption isotherm measurements for neptunium on basalt with the following systems: synthetic groundwater GR-2/McCoy Canyon basalt, synthetic groundwater GR-2/Umtanum basalt, and synthetic groundwater GR-4/Cohassett basalt. We had hoped to determine the concentrations of neptunium in the groundwaters before and after sorption tests by tracing the solutions with ^{235}Np , which has a half-life of 396 d, emits low-energy x-rays, and can easily be detected by well-type scintillation detectors. However, at the higher concentrations of total neptunium, $^{237}\text{Np} + ^{235}\text{Np}$, there were complications in the determination of the concentrations of neptunium due to the presence of ^{233}Pa , the decay product of ^{237}Np , and possibly also due to the x-ray emission of ^{237}Np itself. We, therefore, investigated and are continuing to investigate other methods of determining ^{237}Np at the higher concentration of the isotherm, such as alpha counting and high-resolution counting with a germanium detector.

YUCCA MOUNTAIN INFORMATION EVALUATION

Materials and Methods:

Preparation of a controlled-atmosphere glove box for work with Yucca Mountain samples continues. Mixtures of air and CO_2 were passed through the box, and the pH of synthetic J-13 groundwater was monitored as a function of mixture composition. It appears that a mixture containing 1.5% CO_2 will maintain the synthetic J-13 at a pH of 7.

Radionuclide Sorption/Solubility Values:

No progress to report this month.

GEOCHEMICAL MODELING:

No progress to report this month.

GENERAL ASPECTS

None

MEETINGS AND TRIPS

None

REPORTS AND PUBLICATIONS

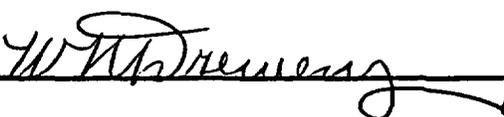
The quarterly progress reports for October-December 1984, January-March 1985, and April-June 1985 are in various stages of preparation. The annual progress report for October 1983-September 1984, which was forwarded in final form on mats to the NRC Project Director on April 29, 1985, is still awaiting publication by NRC.

PROBLEM AREAS

None

COST/BUDGET REPORT

Expenditures were \$25.1K for the month of August and \$436.3K for the fiscal year to date. A detailed cost/budget report will be sent under separate cover.

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