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April 8, 1986

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

Dear Dave:

Please find enclosed the progress report for the month of March 1986 for
B0287, "Technical Assistance in Geochemistry."

Sincerely,

Gary K. Jacobs

Gary K. Jacobs
Manager, NRC Waste Program

GKJ/

Enclosure:

Monthly Progress Report For March 1986

cc: Office of the Director, NMSS (Attn: Program Support Branch)
Division Director, NMSS Division of Waste Management (2)
Branch Chief, Waste Management Branch, RES
P. S. Justus, Chief, Geotechnical Branch
K. C. Jackson, Geotechnical Branch
J. W. Bradbury, Geotechnical Branch
G. F. Birchard, Waste Management Branch, RES
M. Siegel, Sandia National Laboratory
A. D. Kelmars A. P. Malinauskas
R. E. Meyer GKJ File

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PDR WMRES EXIORNL
B-0287 PDR

WM-RES
WM Record File
B0287
ORNL

WM Project 10, 11, 16
Docket No. _____
PDR ✓
LPDR ✓ (B, N, S)

Distribution:

D. Brooks

Joan ticket

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MONTHLY PROGRESS REPORT FOR MARCH 1986

PROJECT TITLE: Technical Assistance in Geochemistry
PROJECT MANAGER: G. K. Jacobs
PROJECT STAFF: J. G. Blencoe, R. M. Gove, A. D. Kelmers,
R. E. Meyer, G. D. O'Kelley, and K. L. Von Damm
ACTIVITY NUMBER: ORNL #41 88 54 92 4 (FIN No. B0287)
NRC #50 19 03 01

TECHNICAL HIGHLIGHTS:

Task 1 - Hanford Site Geochemical Technical Assistance

J. G. Blencoe is continuing to revise the topical report on the solubility information for the Hanford Site.

Task 2 - Yucca Mountain Geochemical Technical Assistance

K. L. Von Damm reviewed two reports that described experiments on the reaction of both radioactive and nonradioactive glass in either deionized water or J-13 groundwater + tuff + stainless steel. The two major conclusions from the studies are that deionized water is a stronger leaching agent than J-13 and that radiolysis does not appear to have a significant effect on glass dissolution under saturated conditions in the presence of tuff. Letter reports (LR-287-37 and LR-287-38) on these documents will be forwarded under separate cover.

Task 3 - Salt Site Geochemical Technical Assistance

J. G. Blencoe reviewed the report: FY-1984 Annual Report: Spent Fuel and UO₂ Source Term Evaluation Results, PNL-5650, 1986, by W. J. Gray and G. L. McVay. The report presents a wealth of information on the leach characteristics of real spent fuel and simulated spent fuel (UO₂) in spent fuel + brine or distilled water + iron + zircaloy experiments performed at 30-90°C for 28-180 days. A detailed review and evaluation will be forwarded under separate cover as letter report LR-287-36.

Task 4 - Short-Term Technical Assistance

In response to a short-term task order, G. D. O'Kelley reviewed the report: Solubility Experiments for the Nevada Nuclear Waste Storage Investigations Project, LA-10560-MS, 1985, by J. F. Kerrisk. The report outlines a program of measurements intended to provide solubilities of important waste elements under conditions pertinent to the Yucca Mountain Site. Although the program

appears to address most of the requirements of the technical position on solubility, there are a few concerns regarding the experimental methods to be employed, and there is little discussion of the important issue of uncertainties. A detailed evaluation will be forwarded under separate cover as letter report LR-287-32.

The letter report (LR-287-29) on the chemistry of plutonium, as requested under short-term task order, was completed during March and forwarded to the NRC Project Manager.

All participants for the sorption workshop to be held in Silver Spring, Maryland, during May 13-15 have been contacted by phone. All of the invited participants plan to attend. Letters confirming their participation and providing further details on the issues to be discussed will be mailed early in April. The NRC Project Manager will be kept abreast of the progress and plans for the workshop.

PROJECT MANAGEMENT:

Nothing to report.

MEETINGS AND TRIPS:

None.

REPORTS AND PUBLICATIONS:

LR-287-29, by J. C. Mailen and J. T. Bell, "Plutonium Chemistry and Migration Behavior in High-Level Waste Repository Environments."

LR-287-32, by G. D. O'Kelley, "Review of: Solubility Experiments for the Nevada Nuclear Waste Storage Investigations Project, LA-10560-MS, 1985, by J. F. Kerrisk."

LR-287-36, by J. G. Blencoe, "Review of: FY-1984 Annual Report: Spent Fuel and UO₂ Source Term Evaluation Results, PNL-5650, 1986, by W. J. Gray and G. L. McVay."

LR-287-37, by K. L. Von Damm, "Review of: 'Leaching Savannah River Plant Nuclear Waste Glass in a Saturated Tuff Environment,' in Scientific Basis for Nuclear Waste Management VIII, Mat. Res. Soc. Symp. 44, 247-256, 1985, by N. E. Bibler, G. G. Wicks, and V. M. Oversby."

LR-287-38, by K. L. Von Damm, "Review of: 'Parametric Testing of a DWPF Borosilicate Glass,' in Scientific Basis for Nuclear Waste Management VIII, Mat. Res. Soc. Symp. 44, 303-310, 1985, by F. Bazan and J. Rego."

PROBLEM AREAS:

None.

COST/BUDGET REPORT:

Expenditures were \$47.1K for March 1986 and \$261.4K for FY 86 to date. A detailed cost/budget report will be sent under separate cover.