

Sandia National Laboratories

Albuquerque, New Mexico 87185

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November 10, 1984

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A1756
SNL

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

Mr. Walton Kelly
U.S. Nuclear Regulatory Commission
Mail Stop 623-SS
Washington, DC 20555

Distribution:

Kelly

(Return to WM, 623-SS)

(Kelly rec'd direct, rec'd
Dec on 1/3/85)

Dear Mr. Kelly:

Enclosed is the monthly report for FIN A-1756. Geochemical
Sensitivity Analysis for October 1984.

Please feel free to contact me if you have any questions or
comments.

Sincerely,

Malcolm

Malcolm D. Siegel
Waste Management Systems
Division 6431

MDS:6431:jm

Enclosure

Copy to:
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PROGRAM: Geochemical Sensitivity
Analysis

FIN#: A-1756

CONTRACTOR: Sandia National
Laboratories

BUDGET PERIOD: 10/01/84 -
9/30/85

DRA PROGRAM MANAGER: W. R. Kelly BUDGET AMOUNT: 317.6K

CONTRACT PROGRAM MANAGER: R. M. Cranwell FTS PHONE: 844-8368

PRINCIPAL INVESTIGATOR: M. D. Siegel FTS PHONE: 846-5448

PROJECT OBJECTIVES

The objective of this project is to provide technical assistance to the NRC in determining the sensitivity of far-field performance assessment calculations to uncertainties in geochemical and hydrological input data and in the representation of geochemical processes in transport models. In Task I, the error in model calculations of integrated radionuclide discharge due to speciation, kinetic and sorption effects will be evaluated. In Task II, the potential importance of organic molecules and colloids will be examined. SNLA will assist the NRC in determining how geochemical processes should be represented in transport models under Task III. Short-term technical assistance will be carried out under Task IV.

ACTIVITIES DURING OCTOBER 1984

Task I Uncertainty in Integrated Radionuclide Discharge

Subtask 1A. Speciation Effects (M. Siegel)

The first meeting of the technical advisory committee for the thermochemical data base was held on October 1, 1984 at Oak Ridge National Laboratory. A trip report for this meeting has been sent to the NRC under a separate cover. Considerable discussion at this meeting dealt with the issue of the trade-off between internal consistency and accuracy of data. Since this meeting, comments offering guidance on this issue have been received from V. Parker of the National Bureau of Standards. These comments as well as guidance from other members of the peer review committee will be summarized in a future progress report.

Subtask 1B. Equilibrium Sorption Effects (M. Siegel)

A critical review of experimental sorption data for tuff was initiated this month.

Subtask IC. Kinetic Effects (M. Siegel, K. Erickson)

Documentation of previous work continued during October for preparation of the FY84 progress report. Several reprint requests for the paper presented at the 1984 annual American Nuclear Society conference have been received (see June 1984 Monthly Progress Report).

Subtask ID. Dynamic Effects (M. Siegel, K. Erickson, M. Chu)

Efforts to examine the applicability of the chemical transport simulation code TRANQL to problems involving 2 km flow paths and 10,000 year periods continued this month. An evaluation of error propagation and mass balance for these long-time simulations is in progress.

Task II Evaluation of Error Due to Organics and Colloids

Subtask IIA Organics

No activity during October

Subtask IIB Colloids (T. Bonano, M. Siegel)

The final version of the paper on colloid migration by Bonano and Beyeler (see September monthly progress report) was prepared for the Materials Research Science 1984 Conference: Scientific Basis for Nuclear Waste Management.

Task IV Short-term Technical Assistance (M. Siegel)

A draft document and a letter report dealing with geochemical data for candidate salt sites were reviewed. Written comments have been sent to the NRC under a separate cover.

An extended trip report summarizing presentations presented at the NNWSI/NRC Geochemistry workshop held in Los Alamos, NM in July was completed and has been forwarded to the NRC under a separate cover.

Trips

M. Siegel, S. Phillips (Lawrence Berkeley Laboratory), and V. Tripathi (Stanford U.) attended the peer review meeting for thermochemical data compilation described under Subtask 1A above.

M. Siegel, K. Erickson, S. Phillips and V. Tripathi attended an NRC-sponsored conference on geochemical modeling and repository assesement at Oak Ridge National Laboratory on October 2-5, 1984. The current state-of-the art of thermodynamic and kinetic modeling of the transport of radionuclides was discussed at the meeting. A general consensus was reached that considerably more experimental data, code development and sensitivity analyses are required before the geochemical

aspects of repository performance can be understood and predicted. The recognition of the need for geochemical sensitivity analyses to identify crucial issues and processes for HLW management was particularly heartening to participants in A-1756

Other Activities

A large portion of this month's effort was related to preparation of the FY 1984 progress report. a revised deadline of November 16, 1984 has been set for this document.

Allocation of Resources During October*

Task I - 75%
Task II - 10%
Task IV - 15%

*Amounts are very approximate and should be used only for qualitative comparisons.

A-1756
1646.010
October, 1984

THIS IS AN ESTIMATE ONLY AND MAY NOT MATCH THE INVOICES SENT TO
NRC BY SANDIA'S ACCOUNTING DEPARTMENT.

	Month	Current Year-to-Date
I. Direct Manpower (man-months of charged effort)	2.3	2.3
II. Direct Loaded Labor Costs	23.0	23.0
Materials and Services	0.0	0.0
ADP Support (computer)	0.0	0.0
Subcontracts	14.0	14.0
Travel	1.0	1.0
Other	1.0	1.0
TOTAL COSTS	39.0	39.0

Other = rounding approximation by computer

III. Funding Status

Prior FY Carryover	FY85 Projected Funding Level	FY85 Funds Received to Date	FY85 Funding Balance Needed
*67.6K	317.6K 250 + 67.6	158.4K	91.6K 41.6K

actual = 27.6K

*Included in this carryover is 40K of FY84 committed funds (purchases)
that have not yet been invoiced.

A-1756
1646.010
September, 1984

THIS IS AN ESTIMATE ONLY AND MAY NOT MATCH THE INVOICES SENT TO
NRC BY SANDIA'S ACCOUNTING DEPARTMENT.

	Month	Current Year-to-Date
I. Direct Manpower (man-months of charged effort)	1.9	11.2
II. Direct Loaded Labor Costs	14.0	103.0
Materials and Services	0.0	4.0
ADP Support (computer)	2.0	5.0
Subcontracts	3.0	14.0
Travel	1.0	5.0
Other	<u>1.0</u>	<u>1.0</u>
TOTAL COSTS	21.0	132.0

Other = rounding approximation by computer

III. Funding Status

Prior FY Carryover	FY84 Projected Funding Level	FY84 Funds Received to Date	FY84 Funding Balance Needed
NONE	200K	200K	NONE