

A1756

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 1 PDR- Wm-10 (2)
 Wm-11 (2)
 Wm-16 (2)

WM Record File

A1756

WM Project

10, 11, 16

Docket No.

PDR

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(10, 11, 16)

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June 15, 1987

Mr. Walton Kelly
 Geotechnical Branch
 Division of Waste Management
 U.S. Nuclear Regulatory Commission
 7915 Eastern Avenue
 Silver Spring, MD 20910

Dear Mr. Kelly:

Enclosed is the monthly report on FIN A-1756, Geochemistry Sensitivity Analysis for May 1987. Please feel free to contact me at (FTS) 844-8368 or Malcolm Siegel at (FTS) 864-5448 if you have any questions or comments.

Sincerely,

Robert M. Cranwell

Robert M. Cranwell, Supervisor
 Waste Management Systems
 Division 6416

RMC:6416

Enclosure

Copy to:

Office of the Director, NMSS
 Attn: Program Support
 Robert Browning, Director
 Division of High-Level Waste Management
 Malcolm R. Knapp, Director
 Division of Low-Level Waste Management and Decommissioning
 Ronald L. Ballard, Chief
 Technical Review Branch
 Division of High-Level Waste Management
 David Brooks
 Geochemistry Section, Technical Review Branch
 Division of High-Level Waste Management
 Document Control Center
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PROGRAM: Geochemical Sensitivity Analysis

FIN#: A-1756

CONTRACTOR: Sandia National
Laboratories

BUDGET PERIOD: 10/86 -
9/87

NMSS PROGRAM MANAGER: W. Kelly

BUDGET AMOUNT: 200K

CONTRACT PROGRAM MANAGER: R. M. Cranwell

FTS PHONE: 844-8368

PRINCIPAL INVESTIGATORS: M. D. Siegel

FTS PHONE: 846-5448

PROJECT OBJECTIVE

The objective of this project is to provide technical assistance to the NRC in determining the sensitivity of performance assessment calculations to uncertainties in geochemical 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, sorption and kinetic 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 in Task III. Short-term technical assistance will be carried out under Task IV and the codes and data bases developed under this project will be transferred to the NRC under Task V.

ACTIVITIES DURING MAY 1987

Task I. Uncertainty in Integrated Radionuclide Discharge

Subtask IA. Conceptual Models for Repository Sites.

During May, calculations of integrated radionuclide discharge using the LHS, NEFTRAN and CCDPLT codes were continued on the VAX computer system. The effects of dispersivity on the integrated discharge were evaluated for four radionuclide travel times. The behavior of all radionuclides in the spent fuel inventory assumed in the SNLA performance assessment methodology was examined. The results for the total radionuclide discharge (five chains) are summarized in Figure 1.

Subtask IB. Solubility/Speciation Effects.

Preparation of the final draft of "Thermodynamic Tables for Use in Performance Assessment of High-Level Waste Repositories. Volume 1. Aqueous Solutions Data Base," NUREG/CR-4864, SAND87-0323 continued during May.

The paper 'Development of an Integrated Geochemical Data Base for Modeling and Sensitivity Analysis in Nuclear Waste Repository

Performance Assessment Studies' was presented at the International Conference on Thermodynamics of Aqueous Systems With Industrial Applications by S. Phillips. The final draft of the paper is being prepared for publication.

A new version of the MINEQL code (MNQMLT) which runs multiple sets of speciation calculations for sensitivity analysis is in preparation.

Subtask IC. Sorption Effects.

No activity during May.

Subtask IE. Coupled/Dynamic Effects

Work continued on new derivations of approximate methods to calculate radionuclide discharge in fractured porous media.

Task IV. Short-Term Technical Assistance.

No activity to report.

Task V. Technology Transfer

Development of a preprocessor and post-processor for sensitivity studies using the MINEQL code continued.

Allocation of Resources

Task I.....50%
Task V.....50%

EPA Release Ratios for Spent Fuel

Effects of Dispersivity and Time

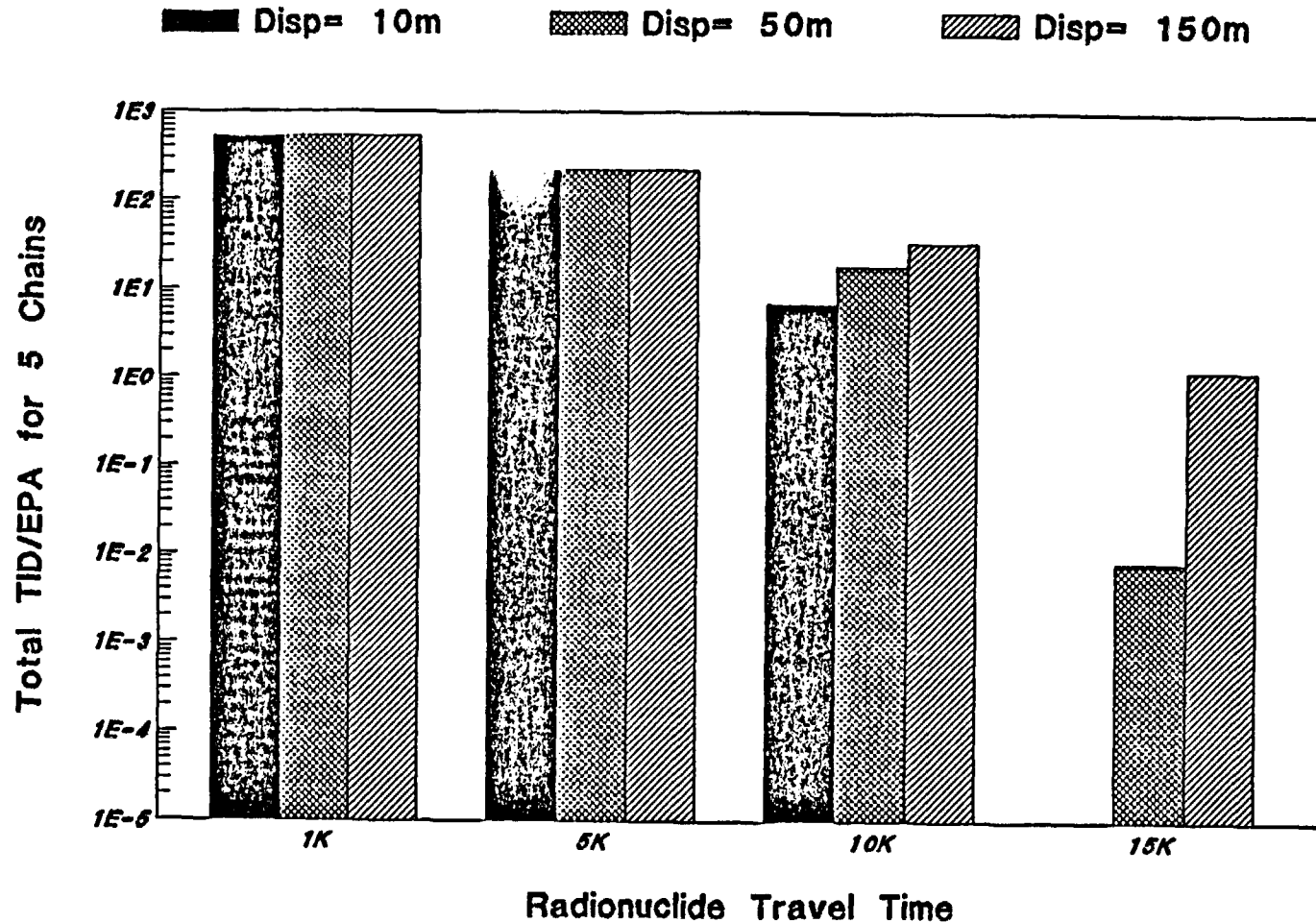


Figure 1. Effect of dispersivity on EPA compliance ratio for four radionuclide travel times. All radionuclides travel with same velocity in a porous medium. A constant annual fractional release rate of 1/100000 of the spent fuel inventory was assumed. A retardation factor of unity was assumed.

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May 1987

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

	Current Month -----	Year -to- Date ----
I. Direct Manpower (man-months of charged effort)	0.2 ---	4.4 ---
II. Direct Loaded Labor Costs	1	37
Materials and Services	0	7
ADP Support (computer)	3	12
Subcontracts	17	164
Travel	1	2
G & A	2	8
Other (computer roundoff)	2 ---	2 ---
*TOTAL COSTS	26	232

III. Funding Status

Prior FY Carryover -----	FY 87 Projected Funding Level -----	FY 87 Funds Received to Date -----	FY 87 Funding Balance Needed -----
29K	229K	200K	None

*Several inter-case transfers are not reflected in these figures.
Total expenditures for FY87 are below \$229K.