

**Sandia National Laboratories**

Albuquerque, New Mexico 87185

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February 17, 1984

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Dr. Richard Codell  
Geotechnical Branch  
Division of Waste Management  
U.S. Nuclear Regulatory Commission  
7915 Eastern Avenue  
Silver Spring, MD 20910

WM Record File

A-1166

WM Project 10, 11, 16

Docket No.           

PDR           

LPDR (D.N.S)

Distribution:

Rcodell

PHite

(Return to WM, 623-SS)

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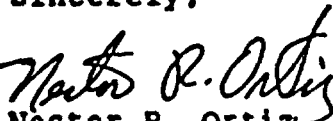
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Dear Dr. Codell:

Enclosed is the monthly report for FIN A-1166, Maintenance of  
Computer Programs, for January 1984.

Please call or write if you have any questions or comments.

Sincerely,



Nestor R. Ortiz, Supervisor  
Waste Management Systems  
Division 6431

NRO:6431:jm

Enclosure

Copy to:

Office of the Director, NMSS  
Attn: Program Support  
Robert Browning, Director  
Division of Waste Management  
Malcolm R. Knapp  
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A-1166 PDR

PROGRAM:	Maintenance and Validation of Computer Programs	FIN#:	A-1166
CONTRACTOR:	Sandia National Laboratories	BUDGET PERIOD:	10/83 - 9/84
NMSS PROGRAM MANAGER:	R. Codell	BUDGET AMOUNT:	\$130K
CONTRACT PROGRAM MANAGER:	N. R. Ortiz	FTS PHONE:	844-5644
PRINCIPAL INVESTIGATORS:	P. A. Davis	FTS PHONE:	846-5421

#### PROJECT OBJECTIVES

The objective is a maintenance task that will ensure that the Sandia computer programs remain consistent with current operating systems, are as error-free as possible, and have up-to-date documentation for NRC. There is also a validation assessment task to identify real physical situations which could provide data for validation of the Sandia computer program.

#### ACTIVITIES DURING JANUARY 1984

##### Verification and Validation

The draft of the report entitled "Verification and Field Comparison of the Sandia Waste-Isolation Flow and Transport Model (SWIFT)" incorporating the suggested changes from the NRC and the SNL staff was received from Mark Reeves of Geotrans Inc. for final management review and sign-off. A few final revisions are being incorporated and a camera ready copy will be sent to NRC for printing by February 28, 1984.

The draft report "Verification of the Network Flow and Transport/Distributed Velocity Method (NWFT/DVM) Computer code" is currently under staff review and is expected to be available for printing by March, 1984.

##### Comparison of Generalized and Fixed Network Versions of NWFT/DVM

The first four sample problems in the User's Manual for the fixed-network version of NWFT/DVM were run. Several differences in the codes have been found so far. With the fixed network the migration path starts at the middle of the repository leg while in generalized network, the path begins at the end of the repository leg. The longer path length used in the fixed network causes difference in the average fluid and isotope velocities between the two versions resulting in some differences in the integrated discharge. If the migration path length is adjusted in the generalized network version to include half of the repository length, better agreement is

obtained between the results of the two codes. When a borehole scenario was simulated (sample problems 3 and 4), the fixed network code adjusts the flux through the repository to be that of the leg connecting the repository and the lower aquifer; the generalized network does not carry out a similar adjustment resulting in large differences between the output from the two codes. However, if the generalized network is allowed to adjust the flux through the repository similarly to the fixed network code, the output from the two codes agree fairly well. The differences between the two codes found to date are being thoroughly documented.

#### Maintenance of Computer Code

Updates for version 4.81 of the Sandia Waste-Isolation Flow and Transport Model (SWIFT) to create the current SWIFT II version of the code are being compiled and provided to Sandia by Geotrans Inc. these updates incorporate several years of computer maintenance of the SWIFT code, in addition to the dual porosity and free-water surface capabilities of SWIFT II. A self-teaching curriculum for SWIFT II is being developed under the Technology Transfer Program A-1158.

The updated version of SWIFT II is expected to be available from Geotrans by March, 1984 and following verification of the sample problems at Sandia the code will be forwarded to the NRC.

A-1166  
1265.020  
January 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)	0.4	1.6
II. Direct Loaded Labor Costs	3.0	16.0
Materials and Services	0.0	0.0
ADP Support (computer)	1.0	3.0
Subcontracts*	3.0	21.0
Travel	0.0	0.0
Other	<u>+1.0</u>	<u>0.0</u>
TOTAL COSTS	8.0	40.0

Other = rounding approximation by computer

### III. Funding Status

Prior FY Carryover	FY84 Projected Funding Level	FY84 Funds Received to Date	FY84 Funding Balance Needed
30K	130K	30K	100K

\*Geotrans Inc.; OAO; Raytheon