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Hydrogeology • Mineral Resources Waste Management • Geological Engineering • Mine Hydrology

June 16, 1988
Contract No. NRC-02-85-008
Fin. No. D-1020
Communication No. 188

Mr. Jeff Pohle
Division of Waste Management
Mail Stop 4-H-3
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Jeff:

We have completed a "Task Description" outlining our thoughts on the conversion of the finite element model UNSAT2 from its documented mainframe version to a PC-compatible version. The format seems to be geared toward NRC products rather than contractor products. We tried to adjust our "Task Description" accordingly. Please call if you have any questions.

Sincerely,

Gerry Winter/sl

Gerry V. Winter

REW:sl

cc: D.L. Chery, Jr.

D1020
WM-11
NH14

TASK DESCRIPTION

Title: Modification of Finite Element Program UNSAT2 for Use on a PC Compatible Computer

Lead Branch/Section: HLTR/Hydrology Section

PPSAS No: TAC No:

Product: Modification of Finite Element Program UNSAT2 for Use on a PC Compatible Computer

Schedule: Initiation Date: Unknown, dependent upon NRC
Completion: 3 months after initiation

Need: The Hydrology Section of the Division of High-Level Waste Management has identified a need for a PC-compatible version of the finite element program UNSAT2.

Use of Product: The staff of the Hydrology Section will find the finite element program UNSAT2 useful for testing conceptual hydrogeologic models of the unsaturated and saturated zones at Yucca Mountain, Nevada. The model can be used in the axisymmetric, vertical cross-section, and areal planar modes. The model can simulate flow in both the unsaturated and saturated zones. Up to five different material properties can be placed in the model in its current configuration. Unsaturated rock or soil moisture characteristics are placed in the model in tabular form. The dimensions (number of nodes and elements) of the finite element mesh are dependent upon storage allocation in the computer.

The PC version of UNSAT2 that will be supplied to the NRC will be developed from NUREG/CR-3390 entitled "Documentation and User's Guide: UNSAT2 - Variably Saturated Flow Model" by Lyle Davis and Shlomo Neuman (1983).

Scope of Product: A working version of UNSAT2 as presented in the aforementioned reference will be supplied to the NRC on a 5-1/4 inch, double-sided, double-density floppy disk. A printout of the PC compatible version of UNSAT2 will be provided. Two sample problems will be included which can be solved on the PC version of UNSAT2. The sample problems and output from the sample problems will be provided as printouts and on one floppy disk.

Contributors: Jeff Pohle

Related Contracts: Williams & Associates, Inc.

Coordination: Jeff Pohle

Required Resources:

	FY88 $K	FY89 $K
WA	6.333	3.167