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Mr. Karl Olson  
 Deputy Director  
 Division of Earth Sciences  
 Lawrence Berkeley Laboratory  
 University of California  
 Berkeley, CA 94720

WM Record File  
B3109

WM Project 10, 11, 16  
 Docket No. \_\_\_\_\_  
 PDR   
 LPCR  (B, N, S)

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Dear Mr. Olson:

As was discussed with A. W. Stromdahl by telephone on April 26, 1983, the NRC is interested in obtaining the LBL computer code MULKOM for the purpose of simulating non-isothermal variably saturated flow in the vicinity of a high-level waste repository. In conversation with two members of your group, Karsten Pruess and Chin Fu Tsang, we have agreed in principle on the work that LBL needs to perform in order to provide the NRC with a versatile and functional form of MULKOM. The work as outlined below falls under Task 6 of NRC contract FIN B-3109.

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The computer code MULKOM along with its variably-saturated non-isothermal flow Equation of State (EOS) module, both of which hereafter will be referred to as MULKOM, will be finalized into such a form that is concisely coded, internally documented, and compatible with Brookhaven National Laboratory's CDC computing facility.

Item 1.1. The contractor will prepare MULKOM in such a manner that the coding will be concise and without extraneous statements or routines. Concise coding will allow for efficient compilation and execution of the code, and assist MULKOM users in defining and correcting problem areas within the code.

Item 1.2. The contractor will internally document MULKOM with pertinent comment statements. These comment statements are to be placed at the beginning of each subroutine and at pertinent junctures within the program. These statements will clearly explain the functions of subroutines and program portions. Important variables will be defined at the beginning of the program.

Item 1.3. The contractor will prepare MULKOM in such a way that it will be readily transferrable to and compatible with the CDC 7600 located at the Brookhaven National Laboratory (BNL) Central Scientific Facility. The method of transfer shall be via magnetic tape, to be mailed by LBL to NRC. Instructions on writing the tape will be forwarded to the contractor prior to transfer. A hard copy source code listing of MULKOM

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and the dayfile of the job used to write the tape shall be transmitted with the tape. LBL shall provide assistance in mounting the tape at BNL, if necessary. This item shall be considered completed only after successful mounting and running of the code by NRC on the BNL system.

Item 1.4. The contractor will meet with and instruct 3 or 4 NRC designates on the use of MULKOM. This meeting will last several days and will be held at LBL.

Item 1.5. The contractor will perform Items 1.1, 1.2, 1.3, and 1.4 in such a manner as to provide a basis for and initiate external documentation efforts. External documentation developed will be developed under consultation with and by approval of the NRC Project Manager.

This letter authorizes the use of funds from Task 6 of NRC contract FIN B-3109 to perform the work stated. It is essential to the objectives of this authorization that Items 1.1, 1.2, and 1.3 be concluded no later than 3 months after this authorization becomes effective. Within one month after this authorization takes effect, the NRC Project Manager and the LBL Principle Investigator shall schedule the meeting outlined under Item 1.4 for a time convenient to both the NRC and LBL. Example or illustrative problems shall be developed for Item 1.4, only as approved by the NRC Project Manager.

This authorization becomes effective upon NRC approval of an itemized cost breakdown and work time table to be submitted by LBL. Notification of NRC approval or disapproval will be provided in writing by the NRC Project Manager shortly after receipt of the work schedule and cost breakdown.

The action taken by this letter is considered to be within the scope of the current contract (FIN B-3109). No change to costs or delivery of existing contracted products is authorized. Please notify me immediately if you believe this letter would result in changes to costs or delivery of contract products.

Sincerely,

Original Signed By:

Julia Corrado  
High-Level Waste Technical  
Development Branch  
Division of Waste Management

FULL COPY  
WED 5/3/83  
CORRADO  
JULIA CORRADO  
5/3/83  
VACATION

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