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August 3, 1984

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B7378

WIA Project 11

Docket No.

PDR

LPDR

Mr. Jeffrey A. Pohle  
Division of Waste Management  
Mail Stop 623-SS  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

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Letter

(Return to WM, 623-SS)

TRUST

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Subject: Contract Number NRC-02-82-047  
Hydrogeology of NTS, Project D  
FIN No. B-7378-4  
Monthly Progress Report for July 1984  
Letter Number 56

Dear Jeff:

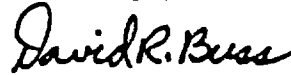
The following work was accomplished during the month of July:

- Completed the initial compilation of structural contour and isopachous maps of the pertinent formations related to the Yucca Mountain Repository. These maps are draft interpretations based upon the data contained in the presently available test hole reports. This information has been forwarded under separate cover.
- Compiled a fence diagram of the region near the repository block based upon this same test hole information. This interpretation was constructed without integrating faulting present at the site.
- James Mercer, David Buss, and Geoffrey Jones attended a data review session at the U.S.G.S. regional offices in Denver, Colorado during July 23-27, 1984.
- James Mercer, David Buss, and Geoffrey Jones conducted a field visit to the NNWSI project area as well as more regional hydrogeologic features in Southern Nevada.
- Updated the reference list to include newly released publications discovered at the data review in Denver. These references are listed in Attachment A.

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Personnel time and cost expenditures are given on the monthly invoice, which is being mailed under separate cover. Total expenditures in July were \$16,202.93. Total expenditures to date are \$190,727.27.

Sincerely yours,



David R. Buss  
Hydrogeologist

**Attachments**

DRB:ldm

**Copies to:**

Office of the Director, NMSS (Attn: Program Support Branch)  
Director, Division of Waste Management (2)

M.J. Mattia

Chief, Geotechnical Branch

R. Williams, Williams & Associates

**ATTACHMENT A: References Received in July**

Thordarson, W., F.E. Rush, R.W. Spengler, and S.J. Waddell, 1984, Geohydrologic and drill-hole data for test well USW H-3, Yucca Mountain, Nye County, Nevada: U.S. Geological Survey Open-File Report 84-149, 28 pp.

Rush, F.E., W. Thordarson, and D.G. Pyles, 1984, Geohydrology of test well USW H-1, Yucca Mountain, Nye County, Nevada: U.S. Geological Survey Open File Report 83-4032, 56 pp.

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CorSTAR  
7315 Wisconsin Avenue  
North Tower, Suite 702  
Bethesda, MD 20814

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SUBJECT: RESPONSE TO MONTHLY PROGRESS REPORT FOR JUNE 1983 (CONTRACT NO.  
NRC-02-81-026/FIN B6985)

Dear Mr. Vogt:

We have reviewed your monthly progress report for June 1984 and have the following comments.

Task 3 - Benchmark Problem Report - Waste Package Codes

You indicate that you plan to submit this draft report to the NRC for review concurrent with an external QA review. As we have noted in a previous conversation (June 13, 1984), the disadvantages of concurrent review in terms of duplicated review effort and the difficulties of reviewing a report which has received only cursory technical editing are such that more time is required for the review by all parties. Therefore, for future reports you should return to the practice of accomplishing the external QA review before the NRC staff review. For this report, however, please ensure that the draft for review has received sufficient technical editing that review time is not unnecessarily extended.

Tasks 4 and 5 - Siting Codes

NRC comments on the 536-page draft benchmark analysis report are in your hands and comments on the revised benchmark problem report are being sent to you by separate letter. One of the problem areas identified in this report relates to the possible need for additional time and possibly additional funds for making extensive changes in the draft benchmark analysis report on siting codes. Please notify me in writing before proceeding with the revisions, if your analysis of the review comments from the NRC and from external QA reviewers shows that changes needed to correct deficiencies in the report will be so extensive as to require a reallocation of unused funds from other tasks in this contract.

Tasks 4 and 5 - Radiological Assessment Codes

Suggested changes in the outline of the benchmark analysis report are the addition of conclusions after each code writeup and overall evaluations of the codes by general area. (See Enclosure 1.) Addressing these issues by code and by code groupings will enable you to make more specific statements for the user

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of the document than might be made in the general conclusions section. Sample graphs showing a draft comparison of computer codes for INTRACOIN Problem 2 run using the DISSPLA package are enclosed for your information and guidance on one means of presenting code comparisons (See Enclosure 2).

Tasks 4 and 5 - Repository Design Codes

Steps to resolve the three problem areas related to this task that are highlighted in the progress report are addressed below.

- o A meeting of pertinent NRC staff scheduled for Wednesday, August 1 to discuss the feasibility and the approach to NRC acquisition of the ADINA and ADINAT package, as recommended in this monthly progress report.
- o A request for access to the INEL computer by Dr. Michael Mills of CorSTAR has been prepared, so that he will be able to use STEALTH at that facility in September.
- o Information upon which to base the decision as to which code of the SPECTROM series is to be used is still being gathered. We expect to receive additional information on the codes that DOE plans to use at the Nevada site this week, and the information will be given to you upon receipt.

The action taken by this letter is considered to be within the scope of the current contract NRC-02-81-026. No changes to cost or delivery of contracted products are 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"

Pauline P. Brooks  
Repository Projects Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosures:

1. Markup of Proposed Outline
2. Sample INTRACOIN graphs and table

cc: P. Cukor  
S. Wollett

WMP:mkq	WMP	WMP				
PPBrooks	DJFehring	JJLinehan				
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BENCHMARKING OF RADIOLOGICAL ASSESSMENT COMPUTER CODES  
Report Outline

I. Introduction

II. Radionuclide Inventory and Heat Generation Codes

A. ORIGEN

1. Code Description
2. Description of Inventory and Heat Benchmark Problems
3. Benchmarking Results

B. ANSIDECH/BURNUP

1. Code Description
2. Description of Heat Problems\*
3. Benchmarking Results

C. Selected Comparisons

III. Environmental Pathways and Dose-to-Man Codes

A. CELLTRANS

1. Code Descriptions
2. Description of Benchmark Problems
3. Benchmarking Results

B. PATH1/DOSHEM

1. Code Description
2. Description of Benchmark Problems\*
3. Benchmarking Results

C. BIDOSE

1. ---\*
2. ---
3. ---

D. PABLM

1. ---\*
2. ---

E. LADTAP

1. ---
2. ---\*
3. ---

F. Selected Comparisons

#### IV. Conclusions of the Study

#### V. Appendices

\*The initial Benchmark Problem Description will not be repeat. Instead only those code specific aspects of the problem will be exmanined.

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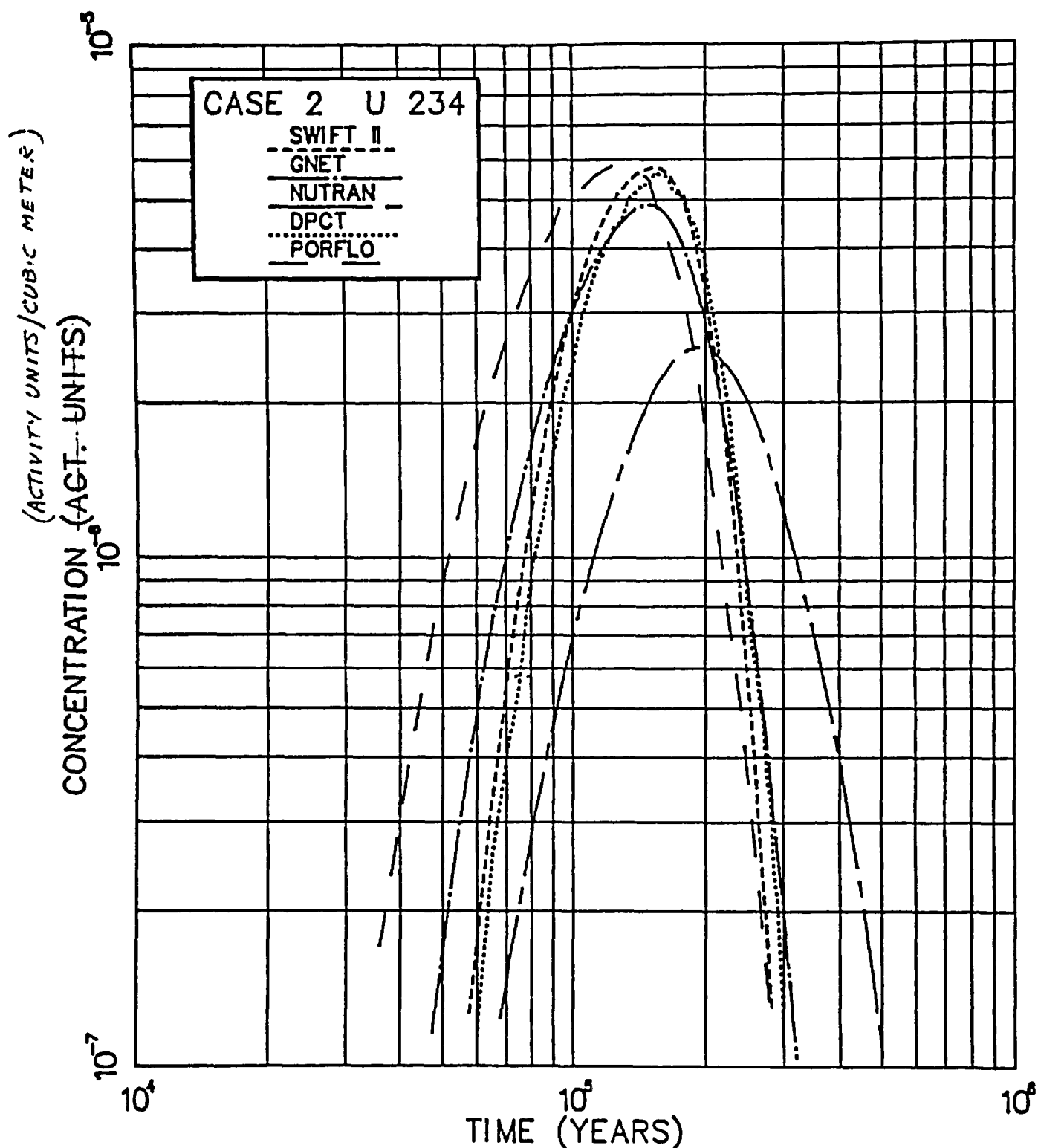


Figure 2.2 Graph of concentration versus time for INTRACON parameters:

Leach Duration(T2)=100000 years;  
 Retention Factor(R1) for three zones=600,300,150;  
 Migration Length(L1)=500 meters;  
 Peclet Number(P2)=10.



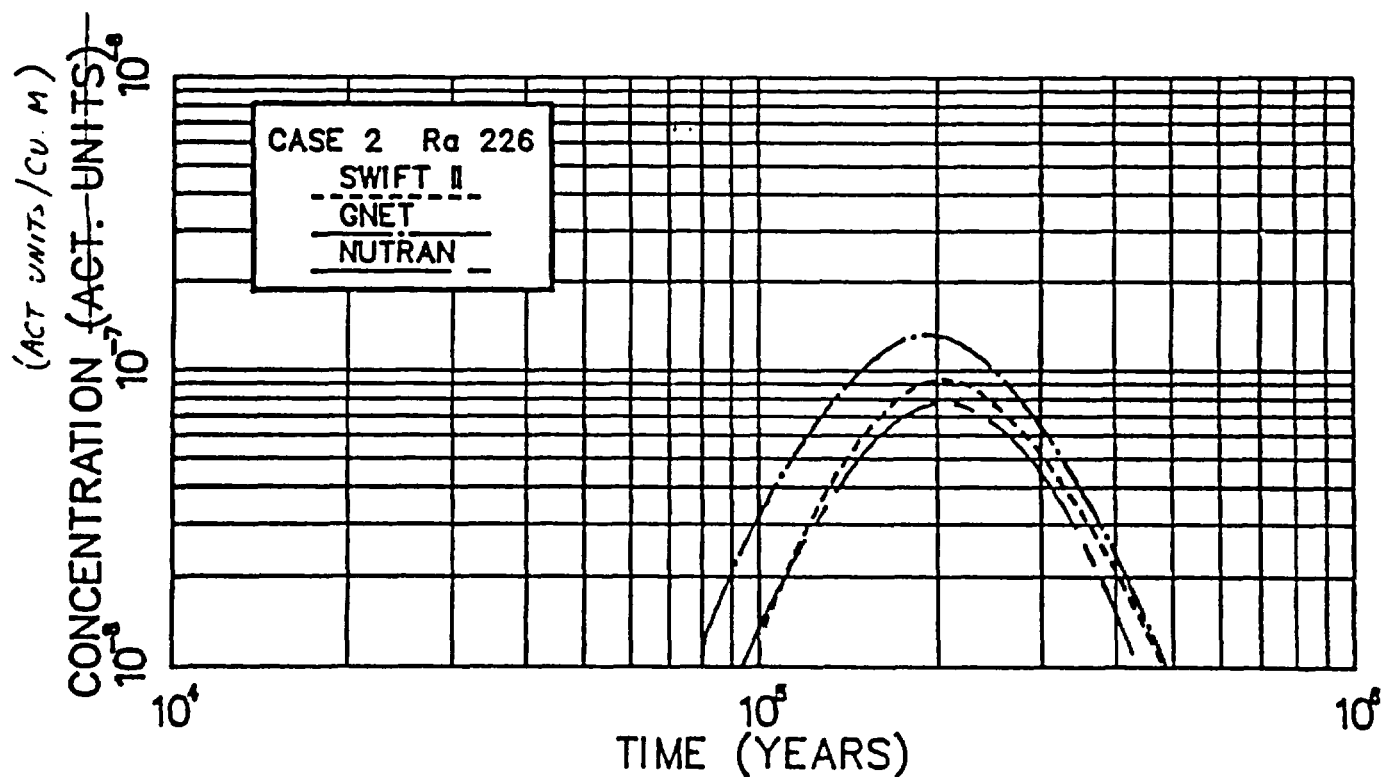
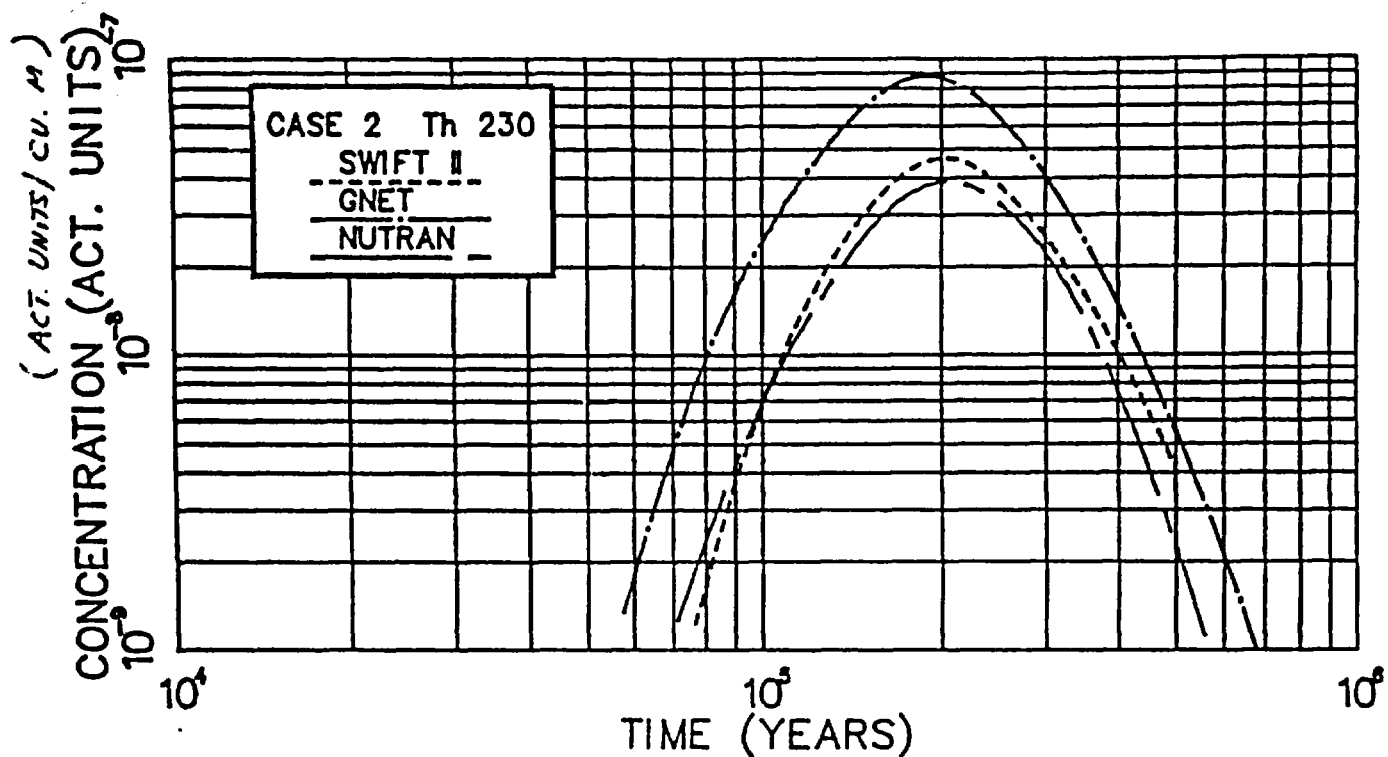


Figure 2.3 Graph of concentration versus time for INTRACON parameters:  
 Leach Duration( $T_2$ )=100000 years;  
 Retention Factors( $R_1$ ) for three zones=40000,20000,10000(Th 230)  
 and 20000,10000,5000(Ra 226);  
 Migration Length( $L_1$ )=500 meters;  
 Peclet Number( $P_2$ )=10.

## CASE 2

## PARAMETERS I1 R1 T2 L1 P2

CODE		CONCENTRATION MAXIMUM	TIME OF MAXIMUM (YEARS)	TIME OF -HALF PEAK (YEARS)	TIME OF +HALF PEAK (YEARS)
U 234					
SWIFT II	B2E1	5.79E-06	154000.	98000.	205000.
GNET	B2E1	4.90E-06	150000.	91000.	208000.
NUTRAN	B2E1	2.57E-06	189000.	122000.	297000.
DPCT	B2E1	5.66E-06	155000.	104000.	211000.
PORFLO	B1E3	5.91E-06	132000.	73000.	182000.
Th 230					
SWIFT II	B2E1	4.67E-08	205000.	135000.	309000.
GNET	B2E1	8.79E-08	188000.	121000.	293000.
NUTRAN	B2E1	3.90E-08	200000.	134000.	315000.
Ra 226					
SWIFT II	B2E1	9.35E-08	205000.	137000.	311000.
GNET	B2E1	1.32E-07	190000.	124000.	298000.
NUTRAN	B2E1	7.80E-08	211000.	135000.	315000.

Table 2.1 Concentration maximum and time of the maximum concentration for each code and nuclide listed. Also the times at which one-half the maximum concentration is reached prior to the peak (-half peak) and after it (+half peak) for INTRACOIN parameters:  
 Nuclide Chain(I1)=U 234,Th 230,Ra 226;  
 Retention Factors(R1) for three zones=600,300,150(U 234),  
 40000,20000,10000(Th 230) and 20000,10000,5000(Ra 226);  
 Leach Duration(T2)=100000 years;  
 Migration Length(L1)=500 meters;  
 Peclet Number(P2)=10;  
 Inlet Boundary Condition=concentration(B1),source(B2);  
 Exit Boundary Condition=semi-infinite(E1),zero concentration gradient(E3).