



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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TO: Joseph Holonich, Director, HLPD, M/S 4 H 3

FROM: Paul T. Prestholt and John W. Gilray
Sr. On-Site Licensing Representatives

DATE: April 29, 1992

SUBJECT: OFFICE OF GEOLOGIC DISPOSAL (OGD) WEEKLY HIGHLIGHTS FOR
THE WEEK ENDING APRIL 10, 1992 and YUCCA MOUNTAIN SITE
OFFICE (YMSO) FIELD ACTIVITY REPORT FOR THE WEEKS
ENDING APRIL 10 and APRIL 17, 1992

Please find enclosed the above-referenced reports.

There is nothing requiring specific management
attention in the reports.

nan

cc w/encs.: Charlotte Abrams, M/S 4 H 3
Rosetta Virgilio, M/S 3 D 23
Dean Kunihiro, Region 5

NOTE TO CHARLOTTE: Also enclosed is the SNL March 1992 Monthly
Highlights and Status Report

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Department of Energy

Yucca Mountain Site Characterization

Project Office

P. O. Box 98608

Las Vegas, NV 89193-8608

WBS 1.2.9.2

QA: N/A

APR 21 1992

John W. Bartlett, Director, Civilian Radioactive Waste Management,
HQ (RW-1) FORS

OFFICE OF GEOLOGIC DISPOSAL (OGD) WEEKLY HIGHLIGHTS FOR THE WEEK ENDING
APRIL 10, 1992

I. CRITICAL ITEM STATUS - YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
(YMP)

A. Site Characterization Planning

Regulatory Interactions

The Regulatory Interactions Branch staff participated in the U.S. Geological Survey (USGS) Climatology Program Review March 31-April 2, 1992, in Denver, Colorado.

Request for Evaluation of Draft Proposal by Lawrence Berkeley Laboratory Entitled, "Scope of Work: Study of the Origin of Secondary Silica/Carbonate Mineral Phases in the Yucca Mountain Region," was submitted to USGS on March 24, 1992.

The Yucca Mountain Site Characterization Project Office (YMPO) and project participant staff supported the Nuclear Waste Technical Review Board (NWTRB) Full Board Meeting in Dallas, Texas, on April 7-8, 1992. They presented information about the Early Site Suitability Evaluation (ESSE), total system performance assessment done in 1991, surface-based testing and drilling program.

Issue Resolution Working Groups

Five working groups met this week. The volcanism group discussed the approach to resolve issues.

A general approach of the seismic hazards group will be to identify discrete subissues to resolve, rather than attack, the entire "seismic" issue. Also discussed was the review of the American Society of Civil Engineers guideline for possible use as a licensing topical report.

The groundwater travel time (GWTT) group met to discuss the GWTT workshop proposed for spring/summer 1992. The relationship between GWTT, disturbed zone, and the engineered barrier system (EBS) were also discussed. Because the disturbed zone and EBS are two interdependent issues, the working groups for both met on April 2, 1992, to discuss how they relate to one another. The consensus is that the program may be able to use the regulatory EBS definition as is, without clarification.

Exploratory Studies Facility (ESF) Task Force Activities

The 50 percent design review is comprised of 28 drawings, 12 analyses and 74 specifications. The Independent Technical Review phase is completed to the extent that all comments were received and resolved. Outside representatives participated in this review, one from NWTB, one from the State of Nevada, and one from the U.S. Nuclear Regulatory Commission (NRC).

The 90 percent design review will be comprised of 80 drawings, 38 analyses and 52 specifications. These counts are in addition to those identified for the 50 percent design review and have changed since last week.

Site Characterization Plan (SCP) Progress Report (PR)

Concurrence on PR 5 is expected from the Secretary of Energy by late this week or early next week. PR 6 input is due this week and has been received from several participants.

SCP Study Plan (SP) Status

No new SPs were received or approved by YMPO during this week. A major revision to SP 8.3.1.12.2.1, "Meteorological Data Collection at the Yucca Mountain Site," was received for processing. SP 8.3.1.9.2.1 was rejected and a new revision, Revision 0, was requested by the U.S. Department of Energy (DOE) by June 10, 1992.

STUDY PLAN BREAKDOWN

In Screening Review	0
In YMP and Headquarters (HQ) Review	6
Awaiting Comment Resolution Meeting	6
Awaiting Author Revision	10
In YMP/HQ Verification Audit	6
Preparing to Submit or Awaiting YMP Approval	3
NRC Phase 1 Review	17
NRC Acceptance	19
Total	67

SCP/SP Status:

Total SPs Assigned to Cover 106 Studies	103
Total SPs Submitted for Review	
Including Revision to SPs	67
Total SPs Not Yet Submitted for Review	44

State of Nevada Comments Status:

Received Comments from the State of Nevada	9
Responses Transmitted to the State of Nevada	5

NRC Comments Status:

Received Comments from NRC	9
Responses Transmitted from OGD to DOE/HQ	5
Responses Transmitted from DOE/HQ to NRC	4

Field Operations

The Site Manager and Field Operations Center staff participated in and provided logistical support to one major tour this reporting period.

Regarding Job Package (JP) 92-2, NRG-1, "Soil and Rock Properties," North ESF Portal Area, during the past week, Reynolds Electrical & Engineering Co., Inc. (REECO), excavated three additional test pits. A total of 29 of 32 test pits have been completed. REECO placed fill on the drill pad and new access road. The supplier delivered and set in place 585 linear feet of concrete barriers along the edge of the new roadway. Work should be completed by close of business April 9, 1992.

Regarding JP 92-4, unsaturated zone (UZ) 16 Drill Pad, REECO regraded the pad to correct the existing slope deficiency, and the pad construction was completed for the UZ-16 borehole. As of April 7, 1992, the LM-300 drill rig was moved in place on the drill pad. We will now undergo preparations for performing an extensive operational readiness shakedown of the drill rig, as well as its associated components, i.e., generators, compressors, flanges, etc. The CME rig was moved to the N-15 location and drilling was started.

Regarding JP 92-5, Midway Valley, all of the 19 test pits as required per the JP have been completed. This concludes Phase I of the excavation work for this study.

The Site Manager and select members of his staff will finalize a white paper on general support facilities siting alternatives for Area 25. It is anticipated this paper will be delivered to the Project Manager, Division Directors, and other staff members by April 20, 1992, for their review and comments.

Geochemistry

A total of 10 test pits have been excavated at the ESF north access site area, and required geologic logs and density tests have been completed for these pits.

Sample Management Facility

Continued the processing of samples from USW UZN-15,16,17. Began drilling and sample recovery from USW UZN-38. Processed and removed approximately 70 core and cutting specimens. Supported Sample Overview Committee meeting on April 7, 1992.

B. Project Planning and Control

Completed updating the Planning and Control System (PACS) data in the M2001 database as provided by Civilian Radioactive Waste Management Systems Management and Operating Contractor (CRWMS M&O) integrators. An annualized cost plan was then produced so CRWMS M&O could determine how they had succeeded in meeting fiscal year (FY) 1993 budget planning objectives. This is a part of a complete review and update of PACS data from FY 1993 through FY 2001 being conducted by CRWMS M&O.

C. Quality Assurance (QA) Implementation

USGS Audit 92-13 is in process. Technical activities will be audited at the USGS facilities at the Nevada Test Site, Las Vegas, Nevada, and Denver, Colorado. Criteria for USGS are QA Elements, 3, 5, 6, 17, 19, and 20. NRC is sending four observers to Denver, Colorado. The audit is scheduled for March 30-April 10, 1992.

Determination of Importance and Grading Enhancement (DIGE)

Continuation of Existing Process

The Quality Review Board and associated assessment team continue to provide support to YMPO while the DIGE effort develops a modified process.

Quality (Q) List and Q-List Procedure Development

A draft revision of the Site Characterization Program Baseline has been developed and is in review. Comments are being resolved from the Quality Management Procedure (QMP) 06-04 review by CRWMS M&O of SAND89-7024. The draft licensing methodology document is being submitted for QMP 06-04 review. Sandia National Laboratories (SNL) continues to complete the Items of Interest to Safety process, as applied to the alluvium, to allow documentation of the analysis. Meetings are occurring with YMP QA regarding resolution of their concerns over the need for QMP 02-10, Q-Grading Procedure. Trainers continue to complete their training and are preparing training material on the various procedures developed as part of DIGE.

Management Control (MC) List and Procedure Development

Efforts to complete resolution of comments to draft MC List Procedure, Administrative Procedure (AP) 5.40, have been slowed due to a changeover in DIGE personnel. Impacts are being assessed. The example extraction exercises are on schedule, to provide input to the Requirements Plan development. Data entry continues, relative to the extraction examples. A draft of the plan is in internal review and those sections dealing with projected costs and schedules are being worked based on input from the example exercises and previous requirements efforts. The draft MC Grading Procedure, AP 5.41, continues to be on hold pending resolution of comments from AP 5.40 and the requirements exercises.

Implementation

As stated in previous status, initiation of procedure and list development by participants will occur when procedures become effective and a new assessment team is in place.

Task Management

Revision 1 of the DIGE Management Plan continues in internal review prior to submittal for review and change control.

D. Public Outreach and Institutional Activities

A Girl Scouts Geology Badge Workshop was held April 4, 1992, at the Las Vegas Yucca Mountain Information Office. Thirty-four girl scouts and 10 leaders attended the four-hour workshop to learn about rocks and minerals, geological time line, fossils, volcanoes, and earthquakes.

Educational presentations were given to students at the Jack Dailey Elementary School by Effie Harle, Science Application International Corporation, on April 6 and 7, 1992, and on April 8 and 9, 1992, by April Gil, DOE. Also on April 8, 1992, Effie Harle gave a presentation at W. E. Ferron Elementary School, and on April 9, 1992, at Derfelt Elementary School.

A presentation on the Yucca Mountain Cultural Resources Program was given by Richard Arnold at the University of Nevada School of Medicine on April 9, 1992.

A. C. Robison, DOE, gave a general project overview presentation on April 8, 1992, at the FY 1994-95 Field Budget Review Meeting.

On April 10, 1992, the Project Manager gave a project overview presentation to representatives from the Swedish Nuclear Fuel and Waste Management Company.

The Office of Institutional and External Affairs (OIEA) staff reviewed the draft workbook for the Director's Forum, and provided comments to HQ.

A tour to Yucca Mountain, Nevada, was conducted on Friday, April 10, 1992, for six guests from Mineral County, Nevada.

The OIEA is coordinating with Eureka County, Nevada, to organize a Yucca Mountain tour for the residents of Eureka County, and is assisting the coordination with Esmeralda County, Nevada, for a tour of the Waste Isolation Pilot Plant.

OIEA developed a schedule for upcoming events. This information will be distributed on a regular basis to affected counties.

II. ANALYSIS & VERIFICATION DIVISION

Attended the NWTB Full Board meeting April 7-8, 1992, in Dallas, Texas. Topics discussed included briefings on the ESSE report, the Total Systems Performance Assessment effort, dry drilling, and surface-based testing.

Participated in a dry run for the May 7, 1992, Director's forum, on April 10, 1992, in Washington, D.C.

Initiated a technical review under AP 1.10Q for SP 8.3.1.17.4.3, "Quaternary Faulting Within 100 km of Yucca Mountain, Including the Walker Lane."

III. GENERAL INFORMATION ITEMS

CRWMS M&O

The first CRWMS M&O SNL Technical Information Exchange (TIE) meeting was held at SNL on April 1, 1992. The agenda included topics regarding repository performance assessment, geological considerations and repository seals. Two major goals were achieved: CRWMS M&O and SNL staffs reviewed their past work in these areas, and personnel of both staffs had the opportunity to meet and facilitate continuing technical communications. The next TIE meeting is scheduled for April 21, 1992, at SNL.

SNL

Progress continued in the analyses of surficial water usage for the north portal area and evaluation of water needs for firefighting purposes. These efforts will be completed by April 30, 1992, and then preparation of a report will be initiated.

Technical & Management Support Services

The electrical power Conceptual Design Report was finalized. It includes preliminary design details and schedule regarding the procurement of electrical power for ESF.

Los Alamos National Laboratory

The Test Planning Package and JP were opened for geological mapping work on Fran Ridge. Technical requirements were developed for a Yucca Mountain prototype test facility.

IV. UPCOMING EVENTS CALENDAR

Please note that the usage of "(P)" in the calendar indicates that the event is open to the public. Educational presentations and State and Public Interactions are handled by the Speakers Bureau; contact Linda Artis at (702) 794-7896 or FTS 544-7896 for additional information. Exhibits are handled by Kevin Rohrer at (702) 794-7769 or FTS 544-7769, and tours are handled by Mindy Wadkins at (702) 794-7374 or FTS 544-7374.

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>YMPO Contact</u>
A. <u>DOE/HQ Meetings</u>			
Tuesday, April 28	Program Management Meeting	Washington, DC	C. Gertz

B. Internal and DOE/NV Meetings

Wednesday, April 15	Nevada Manager's Monthly Program Review	Las Vegas, NV	C. Gertz
<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>YMPO Contact</u>

C. NRC Interactions

Tuesday- Wednesday, April 28-29	Complimentary Cumulative Distribution Function	Albuquerque, NM	T. Bjerstedt
Tuesday, May 19	Interactions Schedulings	Rockville, MD	T. Bjerstedt
Wednesday, May 27	DOE Licensing Topical Report on Erosion	Rockville, MD	T. Bjerstedt
Wednesday, June 3	Drafts on License Application	Rockville, MD	T. Bjerstedt
(TBD) July 1992	Topical Report Calcite-Silica	TBD	T. Bjerstedt
(TBD) August 1992	WIPP - Briefing and Tour	Carlsbad, NM	T. Bjerstedt
(TBD) September 1992	Total System Performance Assessment	TBD	T. Bjerstedt
<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>YMPO Contact</u>

D. NWTRB Interactions (P)

Monday, May 11	NWTRB Panel on EBS	Hanford, WA	A. Simmons
Wednesday, May 13	NWTRB Panel on EBS	Idaho Falls, ID	A. Simmons
Tuesday- Friday, July 7-10	NWTRB Full Board Meeting	Denver, CO	A. Simmons
Tuesday- Wednesday, October 13-14	NWTRB Full Board Meeting	Las Vegas, NV	A. Simmons

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>YMPO Contact</u>
D. <u>NWTRB Interactions (P) (Continued)</u>			
Thursday- Friday, October 15-16	NWTRB Panel on SG&G	Las Vegas, NV	A. Simmons

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Speaker</u>
E. <u>State and Public Interactions</u>			
Saturday, April 11	American Power Dispatchers Assn.	Las Vegas, NV	C. Gertz
Tuesday, April 14	High-Level Radioactive Waste Management Conference	Las Vegas, NV	C. Gertz
Wednesday- Thursday, April 15-16	Coalition for Informed Citizens	Riverton, WY	A. Robison
Monday, April 20	Elko County Library	Elko, NV	A. Robison P. Standish
Monday, April 20	Twin Lakes Elementary School	Las Vegas, NV	E. Harle
Monday, April 20	UNLV Freshman Forum	Las Vegas, NV	C. Gertz B. Reilly
Wednesday, April 22	UNLV	Las Vegas, NV	R. Arnold
Thursday, April 23	Chaparral High School Environmental Congress	Las Vegas, NV	C. Gertz A. Flint
Thursday, April 23	Science Now	Las Vegas, NV	C. Gertz
Thursday, April 23	American Planning Association	Las Vegas, NV	M. Foley
Friday, April 24	Soroptimists International	Sacramento, CA	B. Reilly A. Gil E. Harle

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Speaker</u>
E. <u>State and Public Interactions</u> (Continued)			
Wednesday, April 28	Yucca Mountain Lecture Series	Las Vegas, NV	P. Standish
Thursday, April 30	Yucca Mountain Information Office	Pahrump, NV	C. Gertz
Thursday, April 30	Lions Club	Las Vegas, NV	G. Fasano
Monday, May 4	Beatty High School	Beatty, NV	R. Arnold
Monday, May 4	ASQC Third International Waste Management Conference	Las Vegas, NV	C. Gertz
Thursday, May 7	Nevada Water Savers	Las Vegas, NV	R. Arnold
Thursday, May 7	Yucca Mountain Lecture Series	Pahrump, NV	P. Standish
Wednesday, May 20	Fallon Board of Realtors	Fallon, NV	C. Binzer
Saturday, May 30	Boy Scouts Geology Merit Badge Workshop	Las Vegas, NV	E. Harle
Thursday, June 18	Nevada Republic Women's Club	S. Lake Tahoe, NV	C. Gertz
Thursday, June 18	Association for Commercial Development	Las Vegas, NV	A. Robison

<u>Date</u>	<u>Event</u>	<u>Location</u>
F. <u>Exhibits Scheduled</u>		
Friday- Sunday, April 10-12	Clark County Fair (P)	Logandale, NV
Saturday, April 11	American Power Dispatchers Assn.	Las Vegas, NV

<u>Date</u>	<u>Event</u>	<u>Location</u>
F. <u>Exhibits Scheduled</u> (Continued)		
Sunday- Wednesday, April 12-15	International High- Level Radioactive Waste Management Conference	Las Vegas, NV
Monday, April 20	UNLV Freshman Forum	Las Vegas, NV
Friday, April 24	Soroptimists International	Sacramento, CA
Saturday, April 25	Earth Day/Earth Fair	Las Vegas, NV
Saturday, April 25	Public Open House (P)	Las Vegas, NV
Sunday- Thursday, May 3-6	ASQC International Waste Management Conference	Las Vegas, NV
Monday, Thursday, May 11-14	Institute of Shaft Drilling Technology	Las Vegas, NV
Monday, May 11	Public Update Meeting (P)	Pahrump, NV
Tuesday, May 12	Public Update Meeting (P)	Henderson, NV
Thursday, May 14	Public Update Meeting (P)	Carson City, NV
Thursday, May 14	McQueen High School	Reno, NV
Thursday, May 28	Public Open House (P)	Las Vegas, NV
Saturday, June 27	Public Open House (P)	Las Vegas, NV

APR 21 1992

<u>Date</u>	<u>Event</u>	<u>Escorts</u>
G. <u>Tours Scheduled</u>		
Monday, April 13	Troop 281	P. Fransioli
Monday, April 13	International High- Level Radioactive Waste Management Conference Spouses	TBD
Tuesday, April 14	Beatty High School	S. Tarr L. Camp F. Baird
Wednesday, April 15	Mescalero Apache	W. Dixon R. Arnold
Wednesday, April 15	Western Interstate Energy Board	G. Fasano
Friday, April 17	International High- Level Radioactive Waste Management Conference	K. Beall
Tuesday, April 21	Chaparral High School	T. Pysto
Tuesday, April 21	Chaparral High School Env. Congress	TBD
Wednesday, April 22	LLNL and DOE/OHA	J. Blink
Thursday, April 23	TRW	TBD
Saturday, April 25	Public Open House (P)	Various Escorts
Tuesday, April 28	Las Vegas High School	TBD
Thursday, April 30	Mineral County	C. Binzer

APR 21 1992

<u>Date</u>	<u>Event</u>	<u>Escorts</u>
G. <u>Tours Scheduled</u> (Continued)		
Friday, May 1	Task Force	A. Robison
Friday, May 1	LLNL	J. Blink
Wednesday, May 6	USGS Management	R. Craig
Thursday, May 7	Clark High School	TBD
Friday, May 8	LLNL	J. Blink
Monday, May 11	Institute of Shaft Drilling Technology	TBD
Wednesday, May 20	Las Vegas High School	TBD
Friday, May 22	American Nuclear Society President	C. Gertz
Thursday, May 28	Public Open House (P)	Various Escorts
Saturday, June 27	Public Open House (P)	Various Escorts

YMP:DLH-2881


Carl P. Gertz
Project Manager



Department of Energy

Yucca Mountain Site Characterization

Project Office

P. O. Box 98608

Las Vegas, NV 89193-8608

WBS 1.2.7.4

QA: N/A

APR 22 1992

Carl P. Gertz, Project Manager, YMP, NV

YUCCA MOUNTAIN SITE OFFICE (YMSO) FIELD ACTIVITY REPORT

The following are the significant field activities for the weeks ending April 10, 1992 and April 17, 1992:

1. Field Operations Center, (YMSO)

A. Management and Administration

- a. The Site Manager and FOC staff participated in and provided operational and logistical support to several tours conducted during this period. These were: Mineral County; Troop 281; International High Level Waste management Conference (IHLWMC) Wives; Mescalero Apache; Western Interstate and the HLWMC.
- b. The Site Manager received from the Project Manager the Notice to Proceed for Field Management activities necessary to Support Site Characterization activities for the balance of Fiscal Year 1992 continuing through Fiscal Year 1993.
- c. Site Manager submitted a letter to John Stewart, Director, Nevada Test Site Office, requesting the use of the R-Mad facility for YMP storage of equipment. Anticipate an answer within the next two to three weeks.
- d. Site Manager submitted to select YMP personnel the "White Paper" on the General Support Structures, Siting Development alternatives for Area 25. Comments are due to the Site Manager by COB May 29, 1992.
- e. Site Manager worked with the TRW integrator for WBS 1.2.7 xx Test Facilities for FY 93 and FY 94 budget scenarios.
- f. Members of the FOC staff are developing a field activities network to support the resource survey.
- g. Provided operations and logistics support for field site characterization activities.

B. Project Safety and Health, (DOE/SAIC)

- a. Submitted revised AP-5.7, "Safety and Health Compliance Inspection" for 06-04 review.

APR 22 1992

- b. Wrote WBS dictionary for Safety and Occupational Health and submitted it to Site Manager.
 - c. Drafted letter on "Lights On For Safety" campaign.
 - d. Drafted letter for Site Manager on First Aid Kits in vehicles.
 - e. Made inspections of UZ-16 Rig, N-38, and Trench 14.
 - f. Worked on Inspection Database.
 - g. DOE Safety & Occupational Health Specialists attended the OSHA Training Institute's "Underground Construction Standards" course.
 - h. Provided response to RW-30 Comments on S&H Plan.
 - i. Completed draft WBS editing.
 - j. Completed and submitted to Project Manager final draft of 5 Year Safety and Health Plan.
 - k. Staff attended International High Level Waste Conference.
 - l. Made inspections of UZ-16, N-38, and NG-1.
 - m. Held meeting of the Road Traffic Enhancement Committee to resolve minor traffic problems.
 - n. Researched needs of industrial hygiene sampling program on erionite.
 - o. New Industrial Hygienist on board given site orientation.
- C. Work Request/Photographic Services Coordination
- a. Continued to provide photographic support for ongoing field activities.
 - b. Continued to receive Photo survey responses.

2. Raytheon Services Nevada, (RSN)

A. Field Support

- a. Survey crew continued work on Area 25 control net.
- b. The Field Engineering Group checked the Trench 14 walls on a daily basis in order to determine its suitability for continued operations.
- c. The Field Engineering Group supporting construction activities for NRG-1, Midway Valley, and Soil and Rock Properties trenches and pits.
- d. Survey crew establishing control at existing Drill Hole Sites.
- e. Survey crew continued supporting construction at NRG-1, Midway Valley Trenches, and Soil and Rock Properties trenches and pits.

B. Quality Control

- a. No report submitted.

3. Sample Management Facility, (SMF/SAIC)

- a. Completed UZN-38, 4/13, continued processing of core and cuttings.
- b. Completed processing 174 specimens for USGS.
- c. SMF staff attended training for Stock Picker Operations.
- d. Initiated sample collection at UZN-64.
- e. Continued processing of samples from USW UZN-15, 16, 17.
- f. Supported SOC meeting, 04/07.

4. YMP Hydrologic Research Facility, (USGS)

- a. Normal data retrieval from instrumented holes on Yucca Mountain by Saturated Zone Group.

APR 22 1992

- b. Field personnel conducted neutron logging in the field.
 - c. Meteorological Project collecting satellite data, precipitation data and synoptic scale weather chart information.
 - d. Bob Dickerson, SAIC and Clay Hunter, USGS working at Yucca Mountain doing mapping.
 - e. Ron Linden and Larry Martin, mapping of Ghost Dance Fault.
 - f. John Wesling, Bert Swan, and Mike Angel, Geometrics, Golden working in Midway Valley for geologic studies.
 - g. Chris Freidrick, mapping Crater Flats area.
 - h. Mark McKeown, Jon Darnell, and Bureau of Reclamation staff preserving samples from trenches in Midway Valley.
 - i. Conducted orientation tour on for new employees.
 - j. Carol Loscot, Denver, at NTS in Calibration Lab in support of REECO Low Level Waste Program Calibration of equipment.
 - k. Pat McKinely and O'Brian at NTS for quarterly sampling and snow surveys.
 - l. John Wesling and Mike Angel, Geometrics, Golden working in Midway Valley for geologic studies.
5. Reynolds Electrical and Engineering Co., Inc., (REECO)

Activities conducted during week ending April 10, 1992:

A. Drilling

- a. JP 91-9, Neutron Access Boreholes, moved CME Rig and equipment to UZN-38. Rigged up and drove sample and ODEX casing to 17.91 feet.
- b. JP 92-1, JF-3 Water Monitoring Well, no activity. Possibly pull pump 04/16.
- c. Crew moving LM-300 Rig and equipment to UZ-16 and rigging up.

APR 22 1992

B. Logistics

- a. Continued requisitioning supplies, materials, and services for YMP Field Operations Center.
- b. Supported ongoing and continued preparations for upcoming tours.
- c. Assisted Harry Miller and Sharon Carter in conducting YMP/DOE property audit.

C. Construction

- a. JP 92-2, NRG-1....Completed final grade on drill pad. Completed access road. Supplier delivered and placed 585 LF of concrete barriers.
- b. JP 92-5, Midway Valley....Relocated all shoring from test pits as requested by PI.

Activities conducted during week ending April 17, 1992:

A. Drilling

- a. JP 91-9, Neutron Access Boreholes, UZN-38 completed to depth. Cored to 89.6 feet, cased to 94.26 feet. Rigged down and moved rig to UZN-64. Start coring Thursday morning, 4/16.
- b. JP 92-1, JF-3 Water Monitoring Well, pulling pump out of hole, clutch went out of Joy #1 Rig.
- c. JP 92-4, UZ-16, Rigging up LM-300 Rig and all equipment.

B. Logistics

- a. Continued requisitioning supplies, materials, and services for YMP Field Operations Center.
- b. Supported ongoing and continued preparations for upcoming tours.

C. Construction

- a. No construction activities during this week.

APR 22 1992

6. Los Alamos National Laboratory, (LANL)

- a. No activity reported.

7. Document and Records Center, (SAIC)

Activities during week ending April 10, 1992:

- a. Received and issued for controlled distribution:

Field Change Requests

FCR 92/073, "Miscellaneous Change to NRC-1, Drawings YMP-025-1-CIVL-PL-21, GP21, PR22, and PR23".

- b. Met with RMD Division Manager to provide status on DRC activities at the Area 25 DRC.
- c. Attended FOC staff meeting.
- d. Provided Overview to TRW (Laura Tate, and Project Office QA (Jerry Heaney) regarding submittal of records packages to the DRC.
- e. Copies 4,155 pages for YMP Staff.
- f. Issued 35 controlled documents.
- g. Reproduced 203 engineering copies.
- h. Issued 4 uncontrolled documents.

Activities during week ending April 17, 1992:

- a. Received and issued for controlled distribution:

YMP/TPP-92-01, "Soil and Rock Properties of Potential Locations of Surface and Subsurface Access Facilities, Testing Planning Package 92-02".

- b. Attended YMP Orientation of VBC (Norma Abrahamson).
- c. Attended FOC and RMD Staff meetings.

APR 22 1992

- d. Submitted draft WI-REC-007, Rev. 0, "YMSO-DRC Operations: Local Records Center" to RMD Division Manager for review and comments.
 - e. Revising WI-REC-006, Rev. 1, "YMSO-DRC Operations: Document Control" for internal review.
 - f. Provided overview for T&MSS H&S Department regarding their controlled documents.
 - g. Copies 2, 503 pages for YMP staff.
 - h. Issued 99 controlled documents.
 - i. Reproduced 27 engineering copies.
 - j. Issued 8 uncontrolled documents.
8. Field Training
- a. Conducted GET 1.5 exam for 10 persons.
 - b. Field Radio Communications course conducted.

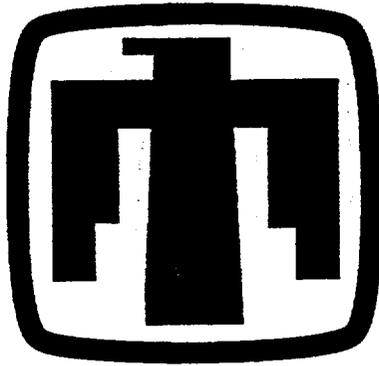
Winfred A. Wilson

Winfred A. Wilson
Site Manager

YMP:WAW-277

cc:

- R. M. Cameron, MACTEC/YMSO, M/S 717
- M. D. Voegele, SAIC, Las Vegas, NV
- R. R. Schneider, SAIC/YMSO, M/S 717
- G. K. Beall, SAIC, Las Vegas, NV
- J. H. Peck, SAIC, Mercury, NV, M/S 719
- C. J. Cotten, SAIC, Las Vegas, NV
- G. D. Milligan, SAIC/YMSO, M/S 717
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Sandia National Laboratories

U.S. DEPARTMENT OF ENERGY

**YUCCA
MOUNTAIN**

**YUCCA
MOUNTAIN
PROJECT**

**Yucca Mountain
Site Characterization Project**

**MONTHLY HIGHLIGHTS
AND STATUS REPORT**

March 1992

MARCH 1992



DISCLAIMER

Quality assurance checks on data contained in this report have been performed only to determine that the data have been obtained and documented properly. The SNL Project Department cautions that any information is preliminary and subject to change as further analyses are performed or as an enlarged and perhaps more representative data base is accumulated. These data and interpretations should be used accordingly. Milestones have not been baselined and are included only to show status.

TABLE OF CONTENTS

WBS 1.2.1	Systems	1
WBS 1.2.1.1	Management and Integration (Klamerus).....	1
WBS 1.2.1.2.1	System Requirements and Description (Klamerus).....	1
WBS 1.2.1.2.2	System Studies (Klamerus).....	1
WBS 1.2.1.2.4	Systems Engineering Implementation (Klamerus).....	1
WBS 1.2.1.2.5	Configuration Management Plans and Procedures Control (Schelling)	1
WBS 1.2.1.2.6	Yucca Mountain Site Characterization Project (YMP) Support to the Management Systems Improvement Strategy (MSIS) (Schelling).....	2
WBS 1.2.1.3.1	Site and Engineering Properties Data Base (Schelling).....	2
WBS 1.2.1.3.2	Interactive Graphics Information System (Jones).....	2
WBS 1.2.1.3.3	Reference Information Base (Schelling).....	3
WBS 1.2.1.3.4	Technical Data Base Management Computer Support (Jones)	3
WBS 1.2.1.3.5	Technical Data Base Input (Sandoval)	4
WBS 1.2.1.4.1	Total System Performance Assessment (Dockery)	4
WBS 1.2.1.4.3.1	Postclosure Repository Design Analysis (Ryder)	4
WBS 1.2.1.4.3.2	Preclosure Radiological Safety Analyses (Klamerus).....	5
WBS 1.2.1.4.3.4	Seal Performance Requirements and Analyses (Fernandez).....	5
WBS 1.2.1.4.4.1	Pre-Waste-Emplacement Ground-Water Travel Time (Dockery)	5
WBS 1.2.1.4.6	Development and Validation of Flow and Transport Models (Nimick)	6
WBS 1.2.1.4.7	Supporting Calculations for Postclosure Performance Analyses (Fewell)	8
WBS 1.2.1.4.8	Performance Confirmation (Dockery).....	9
WBS 1.2.1.4.9	Development and Verification of Flow and Transport Codes (Dockery) ..	9
WBS 1.2.3	Site Investigations	10
WBS 1.2.3.1	Site Management and Integration (Nimick).....	10
WBS 1.2.3.2.2.2.1	Systematic Acquisition of Site-Specific Subsurface Information (Rautman)	10
WBS 1.2.3.2.2.2.2	Three-Dimensional Rock Characteristics Models (Rautman).....	11
WBS 1.2.3.2.7.1.1	Laboratory Thermal Properties (Chocas).....	12
WBS 1.2.3.2.7.1.2	Laboratory Thermal Expansion Testing (Chocas).....	12
WBS 1.2.3.2.7.1.3	Laboratory Determination of Mechanical Properties of Intact Rock (Price).....	12
WBS 1.2.3.2.7.1.4	Laboratory Determination of the Mechanical Properties of Fractures (Price).....	13
WBS 1.2.3.2.8.3.3	Ground Motion from Regional Earthquakes and Underground Nuclear Explosions (Blejwas)	14
WBS 1.2.3.2.8.4.2	Location and Recency of Faulting Near Prospective Surface Facilities (Nimick).....	14
WBS 1.2.3.6.2.1.6	Future Regional Climate/Environments (Sandoval)	15
WBS 1.2.4	Repository Investigations	16
WBS 1.2.4.1.1	Repository Management and Integration (Bauer).....	16
WBS 1.2.4.2.1.1.1	Excavation Investigations (Pott).....	16
WBS 1.2.4.2.1.1.2	In Situ Thermomechanical Properties (Pott)	16
WBS 1.2.4.2.1.1.3	In Situ Mechanical Properties (Pott).....	17
WBS 1.2.4.2.1.1.4	In Situ Design Verification (Pott).....	17
WBS 1.2.4.2.1.2	Rock Mass Analysis (Bauer).....	17
WBS 1.2.4.2.3.1	Certification of Design Methods (Bauer).....	18
WBS 1.2.4.2.3.2	Design Analysis (Ryder).....	18
WBS 1.2.4.6.1	Seal Design and Design Requirements (Fernandez).....	18
WBS 1.2.4.6.2	Sealing Testing (Fernandez).....	18



TABLE OF CONTENTS

WBS 1.2.5	Regulatory and Institutional	19
WBS 1.2.5.1	Management and Integration (Sandoval)	19
WBS 1.2.5.2.1	NRC and NWTRB Interaction Support (Dennis)	19
WBS 1.2.5.2.2	Site Characterization Program (Dennis)	19
WBS 1.2.5.2.3	Regulatory Review (Dennis).....	19
WBS 1.2.5.2.5	Study Plan Coordination (Price)	20
WBS 1.2.5.2.6	Semi-Annual Progress Reports (Cheek-Martin).....	20
WBS 1.2.6	Exploratory Shaft Investigations	21
WBS 1.2.6.1.1	Exploratory Shaft Management, Planning, and Technical Assessment (Pott).....	21
WBS 1.2.9	Project Management.....	22
WBS 1.2.9.1.1	Management (Sharpton)	22
WBS 1.2.9.1.4	Records Management (Hotchkiss).....	22
WBS 1.2.9.1.5	Yucca Mountain Site Characterization Project (YMP) Support for the Training Mission (Sharpton).....	23
WBS 1.2.9.2	Project Control (Mathis).....	23
WBS 1.2.9.3	Quality Assurance Program (Richards).....	24
APPENDIX A:	Technical Data Base Input (Tipton).....	25
APPENDIX B:	Reference Information Base (Schelling).....	26



1.2.1 SYSTEMS

The objective of the Systems element is to provide the focal point for the Yucca Mountain Site Characterization Project (YMP) activities concerned with the integrated perspective of the entire radioactive waste disposal system. The Systems element is comprised of four individual tasks: Systems Management and Integration (1.2.1.1), Systems Engineering (1.2.1.2), Technical Data Base Management (1.2.1.3), and Total System Performance Assessment (1.2.1.4).

1.2.1.1 MANAGEMENT AND INTEGRATION

Significant Meetings Attended

Sandia National Laboratories (SNL) hosted a meeting for the Integrated Test Evaluation (ITE) Task Force subcommittee meeting with Science Applications International Corporation (SAIC), Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and the U.S. Geological Survey (USGS).

Status Report on Ongoing Activities

Two dry runs were made for the scheduled April 7 and 8, 1992 Technical Review Board Meetings to present results of the Total System Performance Assessment (TSPA). Work continues on the Performance Assessment roadmap.

1.2.1.2.1 SYSTEM REQUIREMENTS AND DESCRIPTION

No activity to report this period.

1.2.1.2.2 SYSTEM STUDIES

No activity to report this period.

1.2.1.2.4 SYSTEMS ENGINEERING IMPLEMENTATION

No activity to report this period.

1.2.1.2.5 CONFIGURATION MANAGEMENT PLANS AND PROCEDURES CONTROL

Status Report on Ongoing Activities

Internal Memo of Understanding (IMOU) 330020, Rev. 0, Track Identifier C, was approved by all parties. This IMOU describes activity related to the development of grading.



1.2.1.2.6 YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT (YMP) SUPPORT TO THE MANAGEMENT SYSTEMS IMPROVEMENT STRATEGY (MSIS)

No activity to report this period.

1.2.1.3.1 SITE AND ENGINEERING PROPERTIES DATA BASE (SEPDB)

Significant Meetings Attended

P. Adams of the Site and Engineering Properties Data Base (SEPDB) staff met with L. Lopez and several LANL Principal Investigators (PIs) at Los Alamos, NM on February 18, 1992 to discuss the design of new tables for absorption and dynamic transport data.

Status Report on Ongoing Activities

The SEPDB staff continued its effort to enter, verify, and prepare return packages for all data submitted prior to FY91 that either has not yet been entered into the data base or has not had records completed.

Major Activities Upcoming Next Three Months

Data entry for outstanding data submittals and the investigation of the merger of the SEPDB and GENISES data bases will continue.

Other Items to Report

The following product was issued:

SEP0107 - Drill hole mineralogy and surface sample mineralogy for Activity 8.3.1.5.2.1.5 was sent to C. Johnson, M&O, of Las Vegas, NV.

1.2.1.3.2 INTERACTIVE GRAPHICS INFORMATION SYSTEM (TGIS)

Status Report on Ongoing Activities

The new version of ARC/INFO, a graphics software package, is now loaded and available to anyone on the network with a Sun workstation. Further development is required before printing, plotting and other features are available. The menu system developed for the last version is compatible with the new version.

Efforts to use the Lynx geologic modeling software continue.

The following CALMA jobs have been completed:

<u>Job</u>	<u>Requestor</u>	<u>Description</u>	<u>Status/Comments</u>
381	C. Rautman	T/M contours	Complete
384	R. Barnard	Hydro section	Complete

Major Activities Upcoming Next Three Months

A solid model of thermal/mechanical units, including the drifts, will be developed. A presentation of the models will be prepared for the International High Level Radioactive Waste Management (IHLRWM) conference in April.

Additional files will be obtained from the Project Graphic Information System (GIS) as needed to display contours at a higher resolution. Files that contain graphics to display symbols that match the maps produced at the GIS will also be obtained.

The following CALMA jobs are in progress:

<u>Job</u>	<u>Requestor</u>	<u>Description</u>	<u>Status/Comments</u>
385	W. F. Chambers	FEM of Yucca Mtn. cross-section	Continuing
386	H. A. Dockery	Drill holes/section	Continuing

Video graphics and animation techniques will be developed.

1.2.1.3.3 REFERENCE INFORMATION BASE (RIB)

Status Report on Ongoing Activities

A Project Change Request (CR) was submitted for Change Control Board (CCB) action. The CR requests the addition of five new items to the Reference Information Base (RIB).

Major Activities Upcoming Next Three Months

Additional CRs will be prepared and submitted.

1.2.1.3.4 TECHNICAL DATA BASE MANAGEMENT COMPUTER SUPPORT

Status Report on Ongoing Activities

Staff continued to load PC-NFS, a communication software package, on personal computers (PCs), to install communications boards, and to set up network files to render all PCs operational on the local area network (LAN).

Contractors completed modifications to the computer room that provide additional power outlets and emergency shutoff switches.

TGV software, which connects DEC systems via the Transmission Connection Protocol/Internal Protocol, was installed on the VAX3600 (IGIS) system, so that the system is now accessible directly from LAN workstations.

The Excabyte/Legato backup system is ready for use.

Major Activities Upcoming Next Three Months

The LAN setups for PCs will be completed. Staff will also begin setting up machines for automatic backups on the Excabyte/Legato system. The board on the optical disk drive will be replaced and the electrical connections to all equipment in the computer facility will be mapped and reconfigured as needed to power down in an efficient manner.

Routine backups and system maintenance on all machines will be performed.



1.2.1.3.5 TECHNICAL DATA BASE INPUT

No activity to report this period.

1.2.1.4.1 TOTAL SYSTEM PERFORMANCE ASSESSMENT

Status Report on Ongoing Activities

SAND91-7034, "Numerical Studies of Rock-Gas Flow in Yucca Mountain," by B. Ross, S. Amter, and N. Lu, has been printed and distributed.

SAND92-7032J, "Predicted Gas-Phase Movement of Carbon-14 From a Radioactive Waste Repository," by B. Ross, S. Amter, and N. Lu, is in technical review. This paper will be submitted to Science.

SAND92-7033A, "A Coupled Model of Gas Flow and Heat Transport in Porous Media," by B. Ross, N. Lu, and S. Amter, is in internal technical review. This abstract will be submitted to the American Geophysical Union Spring Meeting in Montreal, Quebec, Canada on May 12 through 15, 1992.

The Total-System Performance Assessment (TSPA) report (SAND91-2795) underwent extensive revision before being submitted for internal technical review. Information from this report will be presented at a Nuclear Regulatory Commission (NRC) technical interchange on air and vapor transport and to the National Academy of Science in mid-March 1992, and to the Nuclear Waste Technical Review Board (NWTRB) at the IHRWM Conference, and at an interchange with the SKB (Sweden's high-level waste organization), all in early April 1992. The TSPA report has been submitted to the YMPO for review.

The artwork for the report on scenario selection for basaltic igneous activity, SAND91-1653, is essentially complete. The artist has been very successful in capturing the details of many elements of each scenario. The addition is expected to render the document invaluable for visualizing and constructing numerical and analytical models related to basaltic igneous activity.

The SAND report on scenario selection for nominal flow is still in rough-draft form. A. Flint of the U.S. Geological Survey (USGS) has agreed to co-author the document. Upon completion of his review and incorporation of the resulting comments, the report will be submitted for internal technical review. The event tree for nominal flow is also currently in revision.

The Total-System Simulator platform, Wingz, is being modified to allow parallel processing on four SPARC stations. This WBS element was unfunded until January 1992; therefore, many of the activities originally planned for this element are currently being reviewed and rescheduled.

1.2.1.4.3.1 POSTCLOSURE REPOSITORY DESIGN ANALYSIS

Significant Meetings Attended

E. Ryder attended a participants meeting on the systems implications of thermal loading in Las Vegas, NV on March 20, 1992. The meeting focused on establishing an appropriate implementation strategy for a study that would address the systems implications of various approaches to repository thermal loading (e.g., a hot versus a cold repository). A follow-up meeting has been tentatively scheduled for April 14, 1992.

Status Report on Ongoing Activities

SAND91-1493, "Equivalent Energy Density Concept: A Preliminary Reexamination of a Technique for Equating Thermal Loads," by E. Ryder, has been sent to the Project Office for policy review. SAND91-1493 documents the results of a study that addresses the thermal design problem of bounding-induced thermomechanical responses over expected ranges of waste stream characteristics (age and burnup). Results are presented for baseline thermal loadings of 57 and 80 kW/acre [based on the layout described in the Site Characterization Plan-Conceptual Design Report (SCP-CDR)] in both the near- and far-fields.

Support for the Management and Operations (M&O) study on the feasibility of using an in-drift emplacement scenario for the potential repository continued during this reporting period. To date, this support has been in the form of highly idealized thermal analyses, waste stream projections, and assistance in defining future study directions.

1.2.1.4.3.2 PRECLOSURE RADIOLOGICAL SAFETY ANALYSES

Significant Meetings Attended

On March 24, 1992, SNL staff hosted a meeting in Albuquerque, NM for the Items Important to Waste Isolation (IITWI) Process Review Team. The SNL presentation showed that the methodology developed is being implemented on unconsolidated surficial deposits.

1.2.1.4.3.4 SEAL PERFORMANCE REQUIREMENTS AND ANALYSES

Status Report on Ongoing Activities

Analyses continued on seismic evaluation of sealing components. This work involves (1) definition of the equivalent static and dynamic loads, (2) evaluation of dynamic amplification as a function of frequency, (3) Universal Distinct Element Code (UDEC) analyses of rigid sealing components, and (4) pseudostatic analysis to establish critical angle of incidence and peak loads. A second analysis developing performance goals for grouted fractured rock continued. This analysis was extended to include different environments in which fractures may be grouted.

1.2.1.4.4.1 PRE-WASTE-EMPLACEMENT GROUND-WATER TRAVEL TIME

Major Accomplishments

SAND87-2380, "Statistical Analysis of Yucca Mountain Hydrologic Data," by B. M. Rutherford, I. J. Hall, R. G. Easterling, R. R. Peters, and E. A. Klavetter, completed all review processes, was published, and is now available for distribution.

Significant Meetings Attended

Staff attended the NRC/DOE Technical Interchange Meeting on Air and Vapor Transport at Yucca Mountain. The meeting was held at the Sheraton in Albuquerque, NM.

Staff hosted S. Borg (YMP) and R. Luce (NWTRB) on a tour of the SNL Yucca Mountain Project on March 19, 1992.

Status Report on Ongoing Activities

SAND92-0461, "Pre-Waste-Emplacement Ground-Water Travel Time Sensitivity and Uncertainty Analyses for Yucca Mountain," by P. Kaplan, completed internal SNL technical review and is currently in management review.

Preparation has begun on a presentation titled "Uncertainty and Sensitivity Results of Pre-Waste-Emplacement Ground-Water Travel Time" for the International High-Level Radioactive Waste Management Conference to be held in Las Vegas, NV in April 1992.

A new, as yet unnamed, two-dimensional steady-state flow model has been developed. Preliminary results indicate that predictions of the flow field at Yucca Mountain may be extremely sensitive to assumptions about boundary conditions. Data were taken from outcrop studies at Yucca Mountain to support further two-dimensional analyses of the sensitivity of performance parameters to boundary conditions. The initial interpretation of the data set suggests that the current hydrostratigraphic models may need further revision.

Work on a document titled "The Probabilistic Basis for Pre-Waste-Emplacement Ground-Water Travel Time Performance Assessment" was begun.

1.2.1.4.6 DEVELOPMENT AND VALIDATION OF FLOW AND TRANSPORT MODELS

Major Accomplishments

All accomplishments have been included in the status report on ongoing activities for the sake of brevity and completeness.

Status Report on Ongoing Activities

Unsaturated flow through single fractures

Experiments are continuing to complete the systematic study of full-field instability in unsaturated fractures as instigated by redistribution following an infiltration event. Preliminary results were presented in SAND91-1985C "Gravity-Driven Fingering in Unsaturated Fractures," by M. J. Nicholl and R. J. Glass, written for presentation at the IHLRWM conference in April 1992. Eight experiments were conducted this month varying the volume of water in the infiltration slug and the angle of the fracture with respect to vertical. Also, the IHLRWM conference presentation was prepared.

Fracture matrix interaction

Presentation of SAND91-2030C "Wetted Region Structure in Horizontal Fractures," by R. J. Glass and D. L. Norton, was prepared for the IHLRWM conference in April 1992. In the paper, small-scale processes that influence wetted structure within the plane of a horizontal fracture as the fracture wets or drains through the matrix are investigated. This approach integrates both aperture-scale modeling and physical experimentation. Several types of aperture-scale models have been defined and implemented. A series of physical experimental systems that allow measurement of wetted-region structure as a function of system parameters and water pressure head in analog fractures also have been designed. In the preliminary proof-of-concept experiment, hysteresis is clearly evident in the measured saturation/pressure relation, as is the process of air entrapment, which causes a reduction in the connected areas between blocks and the wetted region available for flow in the plane of the fracture. A percolation threshold where the system is quickly spanned, allowing fluid conduction in the fracture plane, is observed that is analogous to that found in the aperture-scale models. A fractal wetted and entrapped-region structure is suggested by both experiment and modeling. This structure implies that flow tortuosity for both flow in the fracture and for interblock fluid transfer is a scale-dependent function of pressure head.

Gravity-driven fingering in porous media

R. J. Glass gave an invited presentation to students and faculty at the Department of Hydrology of the University of Arizona on gravity-driven fingering in porous media and fractures.

Field, lab, and numerical experimentation to determine scaling laws for effective-media properties in heterogeneous media

The presentation entitled "Field Research Program for Unsaturated Flow and Transport Experimentation," to be given at the IHLRWM conference in Las Vegas, NV, was prepared. This presentation outlines the approach, scope, and activities related to the field research program for the development and validation of flow and transport models.

This research program will challenge the current understanding of the scaling of effective media properties through the collection of large suites of gas permeability data that span a range of scales. Such measurements will be made quickly and inexpensively, both in the laboratory and in the field, using an instrument termed the gas permeameter. The key to making accurate measurements is establishing a good seal between the rock surface and the permeameter nozzle. On smooth surfaces, as with core samples or rock slabs, a good seal is easy to make, but on an outcrop, sealing is not a trivial matter. In an effort to make a better seal, tests have been run using a seal molded out of caulking putty rather than the standard sealing materials, such as closed-cell foam or silicon rubber stoppers. In recent field tests, the caulking putty has shown to provide a very good seal, even in relatively loosely bedded deposits.

Contact has been made with a Tulsa, OK firm that manufactures gas permeameters for use in the petroleum industry. Such a unit is more portable than the current permeameter. It is constructed of electronic components that reduce errors in reading the measurement and the unit is equipped with a data-logger.

Experiments to develop scaling laws for saturated and unsaturated systems containing micro-layering and cross-bedding heterogeneities, as found in all the alluvial sediments at and around Yucca Mountain and in the bedded tuffs units within Yucca Mountain, are under development.

Three preliminary experiments were run to further develop the automated flow and transport data acquisition system.

Development of experimental capabilities

Preparation was made for the presentation entitled, "X-ray and Visible Light Transmission as Two-Dimensional, Full-Field Moisture-Sensing Techniques," to be given at the IHLRWM Conference in Las Vegas, NV. Work also continued on compiling this work into a journal article for submission to Water Resources Research.

Caisson experiment

Collaboration with LANL YMP staff (E. Springer) in an intermediate-scale (caisson) flow and transport validation experiment continued. Approximately 75 tons of Wedron 510 sand was delivered to LANL during March to be used to fill the caisson. A mixed sand-limonite (cryptocrystalline and crystalline goethite) is being prepared for placement at an intermediate depth within the caisson. Migration of reactive tracers (Ni) through this layer should be measurably retarded and provide a basis for validation of transport codes. Approximately 600 pounds of limonite have been ground at the New Mexico Bureau of Mines for the sorbent layer.

Initial Ni sorption studies indicate that the Ni sorption by sand in 0.01M NaCl solutions is strongly dependent on the pH. In addition, it has been observed that the pH of the sand suspensions is not stable and drifts during measurement, probably due to equilibration with atmospheric CO₂. The final pH, however, is higher than that expected for pure silica sand. In order to better understand the range of pH likely to be encountered in the caisson experiment at LANL, the pH of several batch systems containing sand in 0.01 M NaCl in equilibrium with atmospheric CO₂ were investigated. The first experiment was conducted with raw (untreated) sand at a solid:solution ratio of 1:2. The solution pH changed from 5.47 to 6.04 upon addition of the sand, and stabilized at 7.20 sometime within the first 5.5 hr of mixing. In the second experiment, the sand was first acid-washed to remove any carbonate coatings that could contribute to the observed anomalously high pH. The final pH of this sand in equilibrium with atmospheric CO₂ was approximately 5.0, suggesting that the Wedron 510 sand contains trace amounts of calcite. Experiments and calculations designed to predict the change in pH of solutions percolating through the sand in the caisson due to calcite dissolution and equilibration with atmospheric CO₂ have been initiated.

Scoping iodide sorption experiments in batch systems containing 0.01M NaCl and limonite and/or sand were carried out during March. Anomalous results (negative K_d values) at low total iodide concentrations were encountered and have led to a modification of the analytical technique (substitution of a single-junction reference electrode for the double junction electrode) for the next round of experiments.

Scoping sorption studies

A low-flow Ar purge system has been assembled and documented. This system will provide the ability to purge the headspace of the batch-experiment containers during pH measurements, maintaining CO₂-free conditions. Reagent-container headspace can also be purged. Documentation for the system, including a Pressure-Safety Data Package and a Technical Procedure (TP), was prepared.

Portions of drafts of two papers for the special issue of Radioactive Waste Management and Nuclear Fuel Cycle on the Yucca Mountain Project were prepared during March.

General

A laboratory tour was given to Nuclear Waste Technology Review Board (NWTRB) staff member B. Luce and U.S. Department of Energy/Yucca Mountain Project Office (DOE/YMPO) staff member S. Borg.

Major Activities Upcoming Next Three Months

Relative to the gas permeability studies, purchase of a commercial permeameter and automation of data collection for tests performed on rock slabs in the laboratory are planned. Further activities include refinement of rock seal nozzles for use with thin slabs to provide better control of flow geometry and hence permeability estimates.

Detailed studies of sorption of B, I, and Ni by mixtures of sand and goethite and by materials (samplers and plastic laboratory ware) to be used in caisson or in supporting laboratory studies will continue. Scoping experiments on Li sorption for the caisson experiment will be initiated.

Design calculations for the caisson experiment will continue, and the caisson will be filled and instrumented.

The surface potentiometric titration of sand, goethite, and zeolite will begin.

Two papers for the special issue of Radioactive Waste Management and Nuclear Fuel Cycle on the Yucca Mountain Project will be completed.

1.2.1.4.7 SUPPORTING CALCULATIONS FOR POSTCLOSURE PERFORMANCE ANALYSES

Status Report on Ongoing Activities

The documents describing the performance assessment plan for the Exploratory Studies Facility (ESF) Title II design support will be completed. The plan described in the document will be developed and implemented.

The calculations to estimate the effects on repository performance of surficial water use in the controlled zone but outside the repository (ESF PA Analysis No. 12) have been initiated. The Problem Definition Memo (PDM), describing these calculations PDM 72-32, has been written. The ESF DR Appendix I will be revised to include the results of ESF PA Analysis No. 12.

SAND91-0792, "Estimation of the Impact of Water Movement from Sewage and Settling Ponds Near a Potential High-Level Radioactive Waste Repository at Yucca Mountain, NV," has been published.

Preliminary efforts for a model validation exercise in collaboration with WBS 1.2.1.4.6 have been initiated. Preliminary calculations are being performed and a PDM describing calculations to be made in conjunction with the caisson sand experiments is being written.



1.2.1.4.8 PERFORMANCE CONFIRMATION

No activity to report this period

1.2.1.4.9 CODE DEVELOPMENT AND VERIFICATION

Status Report on Ongoing Activities

Code Development (Subactivity 1.6.2.1.2)

Evaluation of the modified version of JACQ3D on a two-dimensional infiltration problem was completed. Results of the study were documented in an internal memo. In summary, for a problem involving infiltration into a rectangular domain composed of heterogeneous material with a uniform initial pressure head, JACQ performed well given a moderately dry initial pressure head (-7.34m). However, for a case with much lower initial pressure head (-100m), the CPU requirements became prohibitive and the run was stopped prematurely. Thus, if the code is to be used on very dry problems, a more robust scheme for solving nonlinear equations is needed.

One- and two-dimensional benchmarking problems proposed to evaluate the applicability of COYOTEII to flow problems were completed and were documented in an internal memo.

A proposal was submitted to investigate vapor flow through fractured material at Yucca Mountain. The study would consider the effects of barometric pumping, the "Bernoulli effect," and diurnal fluctuations on moisture transport.

Software QA (No SCP activity)

LLUVIA2D and NORIASP were both installed on the Sparc9. They were each successful in solving test cases. The installation report is currently being written for NORIA. NORIASP also was put under informal control of the Source Code Control System (SCCS) as a preliminary test case to resolve the differences between version and release numbers of codes in the SCCS and those in the LRC. SNL staff were involved in preparations of the internal software surveillance that was held during this month.

Staff worked on identifying the computer needs of the new SNL project center that will be formed as result of restructuring in April. A white paper on software quality assurance needs of the new center was also developed.

1.2.3 SITE INVESTIGATIONS

The objective of the Site Investigation element is to determine repository site suitability in terms of DOE siting guidelines (10 CFR 960), Nuclear Regulatory Commission (NRC) criteria (10 CFR 60), and Environmental Protection Agency (EPA) standards (40 CFR 191).

1.2.3.1 SITE MANAGEMENT AND INTEGRATION

Major Accomplishments

M. Siegel served as a member of the Yucca Mountain Geochemistry Integration Team (GIT) during the first half of FY92. As a team member, he participated in the monthly teleconferences and quarterly meetings. The December quarterly meeting was held in Las Vegas, NV on December 4 and 5, 1991. The focus of the meeting was to define the interfaces between geochemistry and performance assessment. Siegel gave a presentation entitled "The Roles of Complex Mechanistic Process Models and Total System Models in Performance Assessment and Sensitivity Analysis." The talk described the adequacy of the representation of geochemical processes performance assessment models with respect to sensitivity analysis. Siegel suggested that the gap between performance assessment and geochemistry can be bridged by development of geochemical scenarios for sensitivity analysis, by using an inverse problem approach, by formulating numerical criteria to assess the validity of approximations used in transport calculations, and by the enlightened use of complex geochemical transport models, such as the LEHGC code. A set of recommendations for improved coordination between geochemical activities and performance assessment was formulated based on the discussions held at the meeting and will be presented to C. Gertz.

Significant Meetings Attended

M. Siegel participated in the March teleconference of the GIT. Final revisions to a letter report describing the December Quarterly Meeting of the GIT and plans for the Spring Quarterly Meeting (joint with the Hydrology Integration Team) were discussed.

The Sample Overview Committee (SOC) met on March 3, 1992 to consider a number of specimen removal requests from various PIs for existing core and for preservation of new core from drill holes UE-25 and UZ-16, anticipated to start drilling in April. The requests for existing core were approved. Requests for core from UZ-16 were approved for a priori preservation of the designated intervals; however, distribution of these preserved core samples will not occur until after other PIs have had the opportunity to view the core and to request critical samples that might otherwise be destroyed in non-critical uses.

The SOC did not take up issues of drill hole prioritization and sequencing as anticipated. Presumably, consideration of these topics will be rescheduled.

1.2.3.2.2.1 SYSTEMATIC ACQUISITION OF SITE-SPECIFIC SUBSURFACE INFORMATION

Significant Meetings Attended

PIs from the Systematic Drilling Program (SCP Activity 8.3.1.4.3.1.1) and the Surface Facilities Exploration Program for Soil and Rock Properties (SCP Activity 8.3.1.14.2) met in Las Vegas, NV on March 18, 1992 with YMPO personnel and staff from SAIC to discuss the feasibility of combining efforts on one or more drill holes. The Soil and Rock Properties Program requires a deep drill hole to identify the exact depth of the transition from the north ramp to the ESF. The Systematic Drilling (SD) Program requires a somewhat deeper hole, in approximately the same location, to support identification of stratigraphic unit contacts and sampling for numerous testing activities. Combining these efforts in an as-yet unnamed drill hole would reduce duplication of effort and cost, while

providing both groups with needed geologic information and physical samples. No irreconcilable differences in requirements were identified, and the PIs will proceed to work out details through input to the Test Planning Package. Drilling may not require use of the LM300 drill rig; the potential for using a smaller rig may accelerate the scheduled start of this joint hole.

Status Report on Ongoing Activities

The revised draft of the Study Plan for this study was essentially completed during the month, and responses to all comments from the Project Office and DOE/HQ have been prepared. An integrated package of comments, responses, and text will be compiled and sent to the Project Office early in April. (SCP Activity 8.3.1.4.3.1)

A new vertical transect of tuffs from Yucca Mountain was collected in late February and early March in cooperation with personnel from the USGS. The transect is important in that the location sampled encompasses an expanded interval of nonwelded tuffs between the Topopah Spring and Tiva Canyon Members. This interval is believed to be very significant with respect to infiltration and redistribution of downward percolating water above the repository horizon. Hydrologic testing of the roughly 150 samples is in progress. Additional outcrop sampling activities to refine estimates of horizontal correlation structure in this important nonwelded interval were under way at the end of March.

Hydrologic testing of a set of 82 samples of existing core and cuttings from the Sample Management Facility has been largely completed at the USGS Hydrologic Research Facility. Evaluation and geostatistical analysis of these test results will begin during April. (SCP Activity 8.3.1.4.3.1.1 and 8.3.1.2.2.3.1)

Major Activities Upcoming Next Three Months

An integrated package on this Study Plan will be compiled and sent to the Project Office in early April. Comment resolution for the Study Plan for this activity continues. Formal acceptance of the revised philosophy regarding testing to be conducted by the study versus coordination of testing to be conducted by others will clear the way for Nuclear Regulatory Commission (NRC) review of this document, which is required before the drilling of the joint Systematic Drilling Program/Surface Facilities Exploration/Soil and Rock Properties drill hole can commence under this study. (SCP Activity 8.3.1.4.3.1.1)

Issues/Potential Problems Needing Resolution and Potential Impacts

Acceptance of the resolution to comments on the Study Plan will need to be a Project priority. Delay would postpone NRC approval of the Study Plan and impact the schedule for drilling the first SD drill hole. Numerous other testing activities also depend upon samples from the SD drilling program. Project and/or HQ action may be required to facilitate final resolution of any remaining issues.

1.2.3.2.2.2.2 THREE-DIMENSIONAL ROCK CHARACTERISTICS MODELS

Status Report on Ongoing Activities

Development activities using the Lynx Geotechnical Modeling System are continuing, although slowly. A software upgrade from Lynx Geosystems has been received and installed successfully. A major upgrade under the beta-test site agreement will be forthcoming later this year. Down-hole deviation survey data from existing drill holes has been loaded successfully, and major unit contacts from these holes are being prepared for input. Digital geophysical log data has been requested from the USGS, but receipt of this information has been delayed. (SCP Activity 8.3.1.4.3.2.1)



Major Activities Upcoming Next Three Months

Modeling activities using the Lynx Geotechnical Modeling System will continue. USGS personnel will visit SNL during April; information from surface stratigraphic studies will be incorporated into the Lynx system. (SCP Activity 8.3.1.4.3.2.1)

1.2.3.2.7.1.1 LABORATORY THERMAL PROPERTIES

Status Report on Ongoing Activities

Experiments to investigate dehydration anomalies observed in welded tuff at temperatures above 160°C have been initiated. (SCP Activity 8.3.1.15.1.1.1)

Calibration of instrumentation and verification of testing prerequisites for thermal conductivity scoping studies continues. (SCP Activity 8.3.1.15.1.1.3)

Major Activities Upcoming Next Three Months

The scoping study on the effects of saturation on thermal conductivity will begin in April. (SCP Activity 8.3.1.15.1.1.3)

A quality assurance (QA) audit of Holometrix is planned for late April.

Other Items to Report

A seminar on the use of the new Environmental Scanning Electron Microscope (ESEM) at the University of New Mexico was attended by C. Chocas (SNL) and J. Connolly (UNM) on March 12, 1992.

1.2.3.2.7.1.2 LABORATORY THERMAL EXPANSION TESTING

Status Report on Ongoing Activities

SAND88-1581, "Linear-Thermal-Expansion Data for Tuffs from the Unsaturated Zone at Yucca Mountain, Nevada," is being prepared for management review. (SCP Activity 8.3.1.15.1.2.1)

Investigations to stabilize the drift in the linear variable dilatometer transformer (LVDT) output during soak times continue. (SCP Activity 8.3.1.15.1.2.1)

Major Activities Upcoming Next Three Months

Once the accuracy and reproducibility of test data is established and the relevant procedures approved, a scoping study on the effects of sample size on thermal expansion will be initiated. (SCP Activity 8.3.1.15.1.2.1)

1.2.3.2.7.1.3 LABORATORY DETERMINATION OF MECHANICAL PROPERTIES OF INTACT ROCK

Status Report on Ongoing Activities

A study involving high-temperature experiments at creep and low strain rate conditions is being conducted at New England Research, Inc. (NER). The data from a series of six experiments run at a nominal axial strain rate of 10^{-9} s^{-1} are being analyzed and a SAND report presenting the data is being

drafted. In addition, the heater is being fabricated and the calibrations being run in preparation for beginning a series of six creep experiments in April. (SCP Activity 8.3.1.15.1.3.2)

R. Price (SNL) is a member of the American Society for Testing and Materials/Institute for Standards Research (ASTM/ISR) Steering Committee for the Interlaboratory Testing Program for Rock Properties. The testing portion of Phase I has been completed, with a total of nine government, private, and academic laboratories participating. The committee is now in the process of writing and revising the report of the data from Phase I and is planning the testing for Phase II. R. Price has revised the Phase II protocols for the participating labs. (No SCP Activity)

SAND92-0223A, "The Influence of Strain Rate and Sample Inhomogeneity on the Moduli and Strength of Topopah Spring Member Tuff," by R. Price (SNL), R. Martin, P. Boyd, and J. Noel (NER), was accepted for presentation at the American Geophysical Union (AGU) Spring 1992 meeting. (SCP Activity 8.3.1.15.1.3.2)

Major Activities Upcoming Next Three Months

A series of six constant stress (creep) experiments will be initiated in April. The samples of TSw2 will be tested at a pore pressure of 4.5 MPa, a confining pressure of 5 MPa, and a constant differential stress of 80 MPa. Initially, the experiments will be performed at room temperature and then at 250 °C. Each test will each take about four months to complete. (SCP Activity 8.3.1.15.1.3.2)

The logbook covering a series of six experiments run at a nominal axial strain rate of 10^{-9} s^{-1} will be submitted to the Data Records Management System (DRMS) and a data report presenting the data from these tests will be drafted and begin the review process in the next six weeks. (SCP Activity 8.3.1.15.1.3.2)

A report presenting the data from and the analysis of experiments performed to study the attenuation and modulus dispersion in tuff will begin the review process in April. (SCP Activity 8.3.1.15.1.3.2)

A report presenting the results of a scoping and procedure study in the collection of bulk properties data will begin the review process in the next two months. These data support the analysis of the mechanical property data. (SCP Activity 8.3.1.15.1.3.2)

1.2.3.2.7.1.4 LABORATORY DETERMINATION OF THE MECHANICAL PROPERTIES OF FRACTURES

Status Report on Ongoing Activities

On March 18 and 19, 1992, S. Brown (SNL) and R. Price (SNL) met with Dr. B. Amadei at the University of Colorado to discuss fracture mechanical properties. The discussions were centered around experiments performed in direct shear and whether there is a direct relation between fractal dimension and the account of surface shear (or damage). The meetings resulted in some preliminary conclusions and ideas for future work to investigate these issues. Additional discussions among the participants are anticipated in the future. (SCP Activities 8.3.1.15.1.4.1 and 8.3.1.15.1.4.2)

To determine the variability of the roughness and the degree of mismatch of the surfaces of natural joints, the topography of seventeen natural joints from the various rock types (including tuff) have been profiled. These data are being analyzed to quantify the roughness of each surface, its scaling (size-dependent) properties, and the degree of mismatch between the two opposing surfaces. A simple mathematical model of rough fractures has been developed based on these data. Using this simple model, a computer code is being developed for simulation of the frictional shear strength of rock joints. Simulations using this code will allow some physical insight into empirically derived

relationships commonly used in engineering geology for design of structures in rock. (SCP Activities 8.3.1.15.1.4.1 and 8.3.1.15.1.4.2)

An informal status report has been written that details the results of experiments being performed in rotary shear. These tests are designed to investigate the effects of different stress paths on the frictional behavior of artificially produced (i.e., relatively smooth) fractures. Following shear deformation on a fracture, the subsequent behavior is highly dependent on whether the fracture remains "primed" (i.e., the normal stress is not relieved) or not. This testing will continue for the next several months. (SCP Activity 8.3.1.15.1.4.2)

Major Activities Upcoming Next Three Months

A journal article summarizing the topography data collected on 17 natural joints and the analysis of the data using the simple mathematical model will be written and submitted. (SCP Activities 8.3.1.15.1.4.1 and 8.3.1.15.1.4.2)

1.2.3.2.8.3.3 GROUND MOTION FROM REGIONAL EARTHQUAKES AND UNDERGROUND NUCLEAR EXPLOSIONS

Status Report on Ongoing Activities

Comments have been received on Study Plan 8.3.17.3.3.2 (Select or develop empirical models for ground motion from underground nuclear explosions) and responses have been initiated.

Major Activities Upcoming Next Three Months

Responses to comments on Study Plan 8.3.17.3.3.2 (Select or develop empirical models for ground motion from underground nuclear explosions) will be completed and transmitted to the Project Office.

1.2.3.2.8.4.2 LOCATION AND REGENCY OF FAULTING NEAR PROSPECTIVE SURFACE FACILITIES

Major Accomplishments

Excavation of soil pits began within Midway Valley to the east of Exile Hills.

Significant Meetings Attended

Results of survival mapping were presented during a poster session at the West Management '92 Conference in Tucson, AZ on March 4, 1992.

Status Report on Ongoing Activities

Work is proceeding on a report for the USGS on Trench A/BR-3, which was excavated last summer in Midway Valley.

Major Activities Upcoming Next Three Months

Excavation will continue of soil pit area trenches in Midway Valley.

1.2.3.6.2.1.6 FUTURE REGIONAL CLIMATE/ENVIRONMENTS

Status Report on Ongoing Activities

Planning was completed for a multiyear regional climate run for the western U.S. with the model driven by the output from a Community Climate Model (CCM) simulation at finer resolution (T42, 2.8 degrees latitude by 2.8 degrees longitude). This run is part of Phase II validation analysis of the coupled GCM-MM4 modeling system at the National Center for Atmospheric Research (NCAR). These present climate simulations are scheduled to be started very soon.

The management review of the paper summarizing the results of the Phase I validation analysis has been completed.

The NCAR contract has been revised as part of the response to Deviation Reports (DRs) 92-02 and 92-03. These DRs are officially closed out.

Major Activities Upcoming Next Three Months

The review of the Phase I report, "Toward the Simulation of Possible Future Climate Scenarios Over the Southern Great Basin," will be completed.

A multiyear regional climate run for the Western U.S., using boundary conditions provided by CCM1 at finer resolution (T420), will be completed.

The software evaluation reports for computer codes associated with the regional climate modeling will be completed.

1.2.4 REPOSITORY INVESTIGATIONS

The objectives of the Repository element are to design a repository compatible with the host rock that meets the engineered barrier performance objectives of 10 CFR 60 and 40 CFR 191; to develop the required instrumentation and equipment for the repository; to obtain the necessary geoengineering data through laboratory and field tests; and to identify repository operation, closure, and decommissioning requirements.

1.2.4.1.1 REPOSITORY MANAGEMENT AND INTEGRATION

Significant Meetings Attended

A technical exchange was held with staff from the Canadian Underground Research Laboratory. Fielding of a large mining test was discussed along with instrumentation problems and in situ stress measurement techniques. SNL staff benefited greatly from the interchange. A letter report on the interchange was forwarded to DOE/HQ.

Major Activities Upcoming Next Three Months

Significant staff and management effort will be required to support the upcoming revision of the Planning and Control System (PACS) (Mission 2001) and to support the Independent Cost Estimate (ICE) Team audit.

Other Items to Report

Two meetings between the M&O repository design staff and SNL staff have been scheduled for April. The agendas for these meetings include discussions of previous design efforts managed by SNL and other repository design issues that need to be resolved during advanced conceptual design (ACD).

1.2.4.2.1.1.1 EXCAVATION INVESTIGATIONS

No activity to report this period.

1.2.4.2.1.1.2 IN SITU THERMOMECHANICAL PROPERTIES

Significant Meetings Attended

L. Costin, J. Pott, and D. Holcomb attended a joint SNL/AECL Rock Mechanics meeting on March 11 and 12, 1992 in Pinawa, Manitoba, Canada.

Status Report on Ongoing Activities

Background material is being researched as a first step in the design of test instrumentation that will operate in the hot thermal environment proposed for the in situ thermomechanical experiments. (SCP Activity 8.3.1.15.1.6)

1.2.4.2.1.3 IN SITU MECHANICAL PROPERTIES

No activity to report this month

1.2.4.2.1.4 IN SITU DESIGN VERIFICATION

Status Report on Ongoing Activities

Comments on Study Plan 8.3.1.15.1.8, In Situ Design Verification, are being reviewed and resolved.

1.2.4.2.1.2 ROCK MASS ANALYSIS

Status Report on Ongoing Activities

Work on Design Investigation Memo (DIM) 260, "Rock Mass Property Assessment-I, Fracture Analysis," continued. For thermal/mechanical units down to and including the Calico Hills nonwelded unit, spacing and orientation of fractures have been determined and analyzed. Using this and other information, rock quality designations (RQDs) for each unit were developed. The work is now documented in draft SAND92-0449, "Fracture Analysis and RQD Estimation for the Yucca Mountain Site Characterization Project," by M. Lin and M. Hardy (Agapito & Associates) and S. Bauer (SNL). The report is currently in peer review.

Work on DIM 261, "Rock Mass Property Assessment-II, Rock Mass Modulus, Strength, Etc.," continued. For thermal/mechanical units down to and including the Calico Hills nonwelded unit, rock mass mechanical properties such as moduli, strengths, etc. have been determined using the output from DIM 260, intact rock properties, and empirical methods. The work is being documented in SAND92-0450, "Rock Mass Mechanical Property Estimations for the Yucca Mountain Site Characterization Project," by M. Lin and M. Hardy (Agapito & Associates) and S. Bauer (SNL). A draft of the report is being prepared.

Work continued on analyses of the heated room experiment in support of the ESF design effort. The analysis work has been slowed in order to complete software QA requirements.

Work continued on a series of laboratory experiments with results intended for use in evaluating and validating the joint models. The initial experiments use a stack of plates of Lexan with a centrally located hole. The plates are being loaded perpendicular to the stacking and displacements are tracked and measured using Moire grid techniques. Preliminary experiments have been completed and analysis of the results is forthcoming. Experimental results to be used as input to analyses being performed in WBS 124231 have been completed.

Major Activities Upcoming Next Three Months

SAND91-1982C, "Fault Stress Analysis for the Yucca Mountain Site Characterization Project," by S. Bauer (SNL) and M. Hardy, R. Goodrich, and M. Lin (Agapito & Associates) will be presented at the American Nuclear Society IHLRWM Conference meeting in April 1992. (SCP Activity 8.3.2.4.1.4)

Preliminary results from DIMs 260 and 261 were presented to interested parties from the DOE, Management and Operations (M&O), and Exploratory Studies Facility (ESF) design group on March 18, 1992 in Las Vegas, NV.

1.2.4.2.3.1 CERTIFICATION OF DESIGN METHODS

Status Report on Ongoing Activities

An important component of the Project involves the development of constitutive models capable of analyzing the responses of jointed rock masses, which is a representative geologic feature of the potential waste repository site at Yucca Mountain, NV. Current compliant joint models represent state-of-the-art analysis capabilities. These models were incorporated into computationally efficient computer codes providing a unique capability of simulation of large-scale field problems. Efforts to improve both the capability and efficiency of the models and codes is ongoing.

Work has continued on a series of numerical analysis of a series of laboratory experiments being performed (WBS 124212). The analyses are intended to help evaluate and validate the joint models. Pretest analyses of the layered model have been completed and the results are currently being studied and evaluated. The work is being summarized in a paper for the International Society for Rock Mechanics (ISRM) Regional Conference, "Fractured and Jointed Rock Masses," to be held in early summer.

Work continued at SNL and Geo Logic Inc. to continue preliminary work to develop a linked boundary element-finite element computer model for analyzing thermomechanical problems associated with design and performance of a potential nuclear waste repository. During this reporting period, efforts have concentrated on combining the boundary element computer program developed previously for calculating the thermally induced displacements and stresses with an existing boundary element method for elastostatics to solve general thermoelasticity problems. The combined boundary element method, when integrated into the finite element program, JAC, to form a hybrid program, will satisfy both the thermal and mechanical boundary conditions at the interfaces between the finite element domain and the boundary element domain.

SAND87-1305, "JAC-3D, A Three-Dimensional Finite Element Computer Program for the Non-Linear Quasi-Static Response of Solids with the Conjugate Gradient Method," by J. Biffle (SNL, 1425), completed management review and is being readied for Project Office review.

1.2.4.2.3.2 DESIGN ANALYSIS

Status Report on Ongoing Activities

Work on Problem Definition Memo (PDM) 75-25, "New 3-D Far-Field Repository Thermomechanical Calculations," continued. The analyses are intended to determine the temperatures, stresses, and strains expected in the vicinity of ESF openings that may become part of the repository. The "new repository design" is being used in the analysis, with thermal loadings of 57 and 80 kW/acre. The work was reviewed by E. Ryder and S. Bauer; preliminary results were presented to the ESF design team on March 18, 1992.

1.2.4.6.1 SEAL DESIGN AND DESIGN REQUIREMENTS

No activity to report this period.

1.2.4.6.2 SEALING TESTING

Status Report on Ongoing Activities

Work continued in the development of the field test definitions report. The efforts concentrated on defining the surface backfill and seepage control tests, defining hydrologics and geophysical techniques to characterize rock, and completion of a draft of the report.



1.2.5 REGULATORY AND INSTITUTIONAL

The objective of the Regulatory and Institutional element is to (1) conduct all activities involving licensing, environmental compliance, communication, and liaison with the State of Nevada, affected Indian tribes, and the public and (2) administer the grants mandated by the Nuclear Waste Policy Act (NWPAA) of 1982.

1.2.5.1 MANAGEMENT AND INTEGRATION

Status Report on Ongoing Activities

R. Orzel represented SNL on the public tour conducted at Yucca Mountain on March 28, 1992. These tours are conducted monthly as part of the DOE public outreach program. A representative from each of the YMP participants is requested to staff the exhibits at the Field Operations Center (FOC) and answer questions that the public might have about the displays.

1.2.5.2.1 NRC and NWTRB INTERACTION SUPPORT

Significant Meetings Attended

Staff attended the NWTRB meeting in Arlington, VA on March 10 and 11, 1992 and the NRC meeting in Albuquerque, NM on March 17 and 18, 1992.

Status Report on Ongoing Activities

Work is underway to provide required support for the April meetings with the NWTRB, the Advisory Committee on Nuclear Waste (ACNW), and the NRC.

Major Activities Upcoming Next Three Months

SNL staff will support and attend the following meetings:

April 6 - 8	NWTRB Meeting in Dallas, TX
April 23 and 24	ACNW Meeting in Bethesda, MD
April 28 and 29	NRC Meeting in Albuquerque, NM
May 11	NWTRB Meeting in Hanford, WA
May 13	NWTRB Meeting in Idaho Falls, ID
May 19	NRC Meeting in Rockville, MD
May 26 and 27	ACNW Meeting in Bethesda, MD
May 27	NRC Meeting in Rockville, MD
May 27	ACNW Meeting in Bethesda, MD
May 28 and 29	ACNW Meeting in Bethesda, MD
June 3	NRC Meeting in Rockville, MD
June 25 and 26	ACNW Meeting in Hanford, WA

1.2.5.2.2 SITE CHARACTERIZATION PROGRAM

No activity to report for this period.

1.2.5.2.3 REGULATORY REVIEW

No activity to report for this period.



1.2.5.2.5 STUDY PLAN COORDINATION

Major Accomplishments

Study Plan 8.3.1.2.2.2, "Water Movement Test," written by LANL staff, was reviewed by M. Siegel in response to a Project Office request. Comments were submitted to YMPO on March 27, 1992. (No SCP Activity)

Major Activities Upcoming Next Three Months

Study Plan 8.3.1.4.3.1.1, "Systematic Acquisition of Site-Specific Subsurface Information - Systematic Drilling Program," by C. A. Rautman, has been reviewed by other Project participants, YMPO, and HQ personnel. The review comments were received on October 3, 1990 and will be responded to within the next two months. (SCP Activity 8.3.1.4.3.1.1)

1.2.5.2.6 SEMI-ANNUAL PROGRESS REPORTS

Status Report on Ongoing Activities

A meeting was held on March 20, 1992 to begin the preparation of the Semi-Annual Progress Report.

Major Activities Upcoming Next Three Months

The Semi-Annual Progress Report for October 1, 1991 through March 31, 1992 will be prepared and submitted to the Project Office by April 6, 1992.



1.2.6 EXPLORATORY SHAFT INVESTIGATIONS

The objective of the Exploratory Shaft element is to develop, design, construct, operate, maintain, and decommission the exploratory shafts required for site characterization and to plan and implement the in situ testing program.

1.2.6.1.1 EXPLORATORY SHAFT MANAGEMENT, PLANNING, AND TECHNICAL ASSESSMENT

Preliminary discussions were held with the LANL Test Coordinators regarding sampling needs and consolidating the sampling efforts.

A review of the SNL laboratory and field test program was performed to determine which, if any, tests SNL should field during the construction of the North Ramp TBM Launch chamber. Sample collection for laboratory tests was the only activity identified as being applicable to this early construction activity.



1.2.9 PROJECT MANAGEMENT

The objective of the Project Management element is to schedule, budget, perform, control, coordinate, and report Project management, Project control, and quality assurance work. This includes identifying and defining interfaces among Project elements and integrating those elements.

1.2.9.1.1 MANAGEMENT

Significant Meetings Attended

Staff attended the first meeting of the YMP Information Resources Management Council in Las Vegas, NV on March 25, 1992.

Status Report on Ongoing Activities

Work continued on updating the property database. Staff was trained in requirements regarding property procured with Nuclear Waste Funds.

Management of production of technical reports has transitioned to new staff.

All IHRWM conference papers have been submitted as record packages to the local records center (LRC).

Major Activities Upcoming Next Three Months

Technical publication staff will meet with Project Office Central Records Facility (CRF) staff in April to discuss Records Information System (RIS) problems and receive training.

The close out of the DOE/YMP Property Audit will be conducted and audit observations will be addressed. An information bulletin detailing requirements for use and disposal of property acquired with Nuclear Waste Funds will be written and distributed to all SNL staff supporting the YMP.

1.2.9.1.4 RECORDS MANAGEMENT

Major Accomplishments

The SNL Local Records Center was awarded the YMP Records and Document Control Quality Service Recognition Award for the fourth quarter of 1991. This award recognizes superior achievement, process improvements, and customer service.

Significant Meetings Attended

Records staff attended the YMP Records Coordinators Meeting in Las Vegas, NV on March 4 and 5, 1992. Records staff also attended the Association of Record Managers and Administrators (ARMA) Spring Conference in Albuquerque, NM on March 19, 1992. Technical and Management Support Services (T&MSS) records staff conducted a one-day workshop in Albuquerque, NM for Records Management staff on the use of the Records Information System (RIS) and records indexing methodologies.

Status Report on Ongoing Activities

Record source training was provided to SNL YMP staff. Development of supplemental modules for the on-the-job (OJT) program for LRC staff continued. Sorting of backlog records related to the Site Characterization Project (SCP) was initiated. Indexing of photos for the Nevada Test Site (NTS) Photos Database continued.

Major Activities Upcoming Next Three Months

QAIPs 17-1 and 17-3 will be issued.

1.2.9.1.5 YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT (YMP) SUPPORT FOR THE TRAINING MISSION

Status Report on Ongoing Activities

The new training program, Training for Optimal Performance by Staff (TOPS), was presented to and approved by the Technical Project Officer (TPO).

A textbook for use in an Interdisciplinary Technical Training general geology course has been identified and a sample copy is being obtained. An instructor has also been identified.

A preliminary matrix has been developed as the first step of implementing the Job Effectiveness Training (JET) component of TOPS.

The Computational and Visualization Environment (CaVE) users' survey has been completed and the results are being compiled. These results will be analyzed and training will be developed and implemented based on same.

Major Activities Upcoming Next Three Months

Several staff will be attending "Using Video's Power in Training" course on April 1 through 3, 1992 at the Sony Institute in California.

Training staff F. Cheek-Martin and A. Hotchkiss will attend the Project Office's "Train the Trainer" five-day class in Las Vegas, NV on April 20 through 24, 1992.

Staff will participate in the Training Coordinators meeting, which is currently expected to be held in Washington, DC in May.

A revised proposal for the development and implementation of JET will be prepared and presented to the TPO in mid-May.

1.2.9.2 PROJECT CONTROL

Significant Meetings Attended

The YMP Project Control Steering Committee (PCSC) met in Albuquerque, NM on March 20, 1992. Discussions were held on the upcoming ICE Team visits from DOE/HQ and the Mission 2001 effort planned by the M&O.

Status Report on Ongoing Activities

Actual cost and network status reports were sent to YMPO. The clean up on PACs data bases continued.

The PACS video is still under development. Additional filming is scheduled for early May. Progress on the film has been slower than originally expected because of delays in obtaining computer equipment needed for the animation segments.

Work is continuing on the QADEFs data base software, with completion and installation in the production mode being planned for the first or second week in April.

A process to use FTP software to transfer text files from the YMP VAX computers to the AIMS computers has been developed and documented for use by AIMS users.

A utility menu was developed on the Administrative Information Management System (AIMS) computer to allow AIMS users to communicate using the UNIX mail facility on the AIMS computer.

Major Activities Upcoming Next Three Months

Replanning for FY93 - FY01 is expected to start on April 6, 1992.

The PACs video will be completed, previewed and presented.

Information packages will be assembled for the ICE Team visit. The PACS workstation software will be installed permitting electronic transmittal of PACS data to Las Vegas, NV.

The YMP PCSC will meet in Albuquerque, NM on April 24, 1992 to discuss the progress of the ICE Team visits and the Mission 2001 effort.

1.2.9.3 QUALITY ASSURANCE PROGRAM

Status Report on Ongoing Activities

The QA audits of NER and Holometrix were rescheduled from February 1992 to the last week of April 1992. The revised schedule was required to allow participation of key personnel from both facilities and the required SNL technical specialists deemed crucial for a performance-based assessment of quality-affecting activities.

Quality Assurance Implementing Procedures (QAIPs) 16-1 (Corrective Action) and 18-1 (Quality Assurance Audits) are in management review. QAIPs 15-1 (Nonconformance Control and Reporting), 17-3 (Processing YMP Records), and 1-5 (Work Agreements) are in preliminary draft review. DOP 17-1 (Records Management System), revised and retitled as QAIP 17-1, "Preparing and Submitting YMP Records," is also in draft review.

The SNL NWRT QA Department submitted a response to a Corrective Action Report (CAR), YMP 92-021, that was issued as a result of YMP Audit 92-09 conducted in February 1992. Additionally, the proposed actions were completed and objective evidence thereof submitted to the Yucca Mountain QA Division.

Major Activities Upcoming Next Three Months

QA program changes dictated by the SNL restructuring will continue to be identified and implemented.

The review of SNL QAIPs for improvement and simplification will continue.

Activity will continue on the development of a new computer-based QA matrix.

An internal surveillance of software code development (specific to WBS 1.2.1.4.9 activities) is scheduled.

The SNL internal audit tentatively scheduled for late May or early June 1992 will focus on the implementation of QA controls applicable to ongoing significant technical activity.

Other Items to Report

Work was completed within the SNL NWRT QA organization to identify the impact of the transition to a revised work breakdown structure (WBS) system.

J. V. Voigt (MACTEC) is scheduled to present a poster session at the April 1992 IHLRWM conference.

APPENDIX A: TECHNICAL DATA BASE INPUT

1. CANDIDATE DATA FOR THE TECHNICAL DATA BASE

<u>Participant</u>	<u>Description of Data</u>
SNL	"Uniaxial and Triaxial Compression Test Series on Calico Hills Tuff," SAND82-1314, R. H. Price.
SNL	"Uniaxial and Triaxial Compression Test Series on Topopah Spring Tuff," SAND82-1723, R. H. Price.
SNL	"Uniaxial Compression Test Series on Topopah Spring Tuff from USW GU-2, Yucca Mountain, Southern Nevada," SAND83-1646, R. H. Price.
SNL	"Preliminary Characterization of the Petrologic, Bulk, and Mechanical Properties of a Lithophysal Zone Within the Topopah Spring Member of the Paintbrush Tuff," SAND84-0860, R. H. Price.

2. DATA FORMALLY SUBMITTED TO THE TECHNICAL DATA BASE

<u>Participant</u>	<u>Description of Data</u>	<u>SNL Data Auth. No.</u>
USGS	"Strontium Isotopes in Carbonate Deposits at Crater Flat, Nevada," from the High Level Radioactive Waste Management Proceedings of the Second International Conference.	Not applicable
USGS	"Assessing the Natural Performance of Felsic Tuffs using the Rb-Sr and Sm-Nd Systems--A Study of the Altered Zone in the Topopah Spring Member, Paintbrush Tuff, Yucca Mountain, Nevada," from the Materials Research Society Symposium Proceedings.	Not applicable
USGS	"Distribution of Rubidium, Strontium and Zirconium in Tuff From Two Deep Coreholes at Yucca Mountain, Nevada," from the High Level Radioactive Waste Management Proceedings of the Second International Conference.	Not applicable

3. DATA FORMALLY ENTERED INTO THE TECHNICAL DATA BASE

<u>Participant</u>	<u>Description of Data</u>	<u>SNL Data Auth. No.</u>
USGS	Drill hole mineralogy data	DA0045
USGS	Drill hole and surface sample mineralogy data, Surface sample location and description	DA0068
USGS	Surface sample mineralogy data	DA0126
USGS	Drill hole mineralogy data	DA0128
LLNL	Solubility of radionuclide data	DA0155 and DA0159
LLNL	Drill hole mineralogy data	DA0156
USGS	Surface sample mineralogy data	DA0162



APPENDIX B: REFERENCE INFORMATION BASE

1. REFERENCE INFORMATION BASE (RIB) CHANGE REQUESTS SUBMITTED*

<u>RIBCR</u>	<u>Subject</u>	<u>Participant</u>	<u>Status</u>
None.			

2. INFORMATION BEING PROCESSED AS RIB CHANGE DEVELOPMENT FILES FOR CONSIDERATION AS INPUT TO THE RIB*

<u>RIBCR</u>	<u>Subject</u>	<u>Status</u>
CR57	Calcite-Silica Vein Deposits	Submitted to CCB
CR58	Volcanic Features	Review
CR60	Spent Fuel Vertical Emplacement	Cancelled
CR61	Spent Fuel Horizontal Emplacement	Cancelled
CR62	Geomorphic Processes	Cancelled
CR63	Estimated Water Usage	Review Complete
CR64	Physiographic Divisions	Cancelled
CR65	Tectonic Geomorphology	Cancelled
CR66	Mechanical Excavation	Cancelled
CR67	Thermal/Mechanical Cross Sections	Submitted to CCB
CR68	Existing Roads	Cancelled
CR70	Hydrogeologic Zones	Submitted to CCB
CR71	Potential Transportation Routes	Review Complete
CR72	Material Specifications - Surface	Cancelled
CR75	Regional Seismic History	Submitted to CCB
CR76	UNE Seismicity	Submitted to CCB
CR77	Rock Mass and Q Ratings	Cancelled
CR80	Water Application Movement	Under Development
CR81	Thermal/Mechanical Surfaces	Review
CR82	Topographic Maps	Review Complete

3. INFORMATION ENTERED INTO THE RIB

None.

*Candidate information is identified by RIB Change Requests, which are prepared in accordance with Revision 0 of Yucca Mountain Project Administrative Procedure AP-5.3Q, "Information Flow Into the Reference Information Base," which is implemented at SNL as Department Operating Procedure (DOP) DOP 3-8.