

February 12, 1986

Summary of Progress Report, UZ-Hydrochemistry

Albert Yang

U.S. Geological Survey MS-416

Denver Federal Center

Lakewood, CO 80225

1. Extraction of pore water from tuff by triaxial compression:

Pore fluid has been successfully extracted from tuff samples with water content greater than 11%. The method developed involves three axial-pressure levels from 76 MPa (11,000 psi), to 152 MPa (22,000 psi) with confining pressures of 59 MPa (8,500 psi) to 62 MPa (9,000 psi), and time span (total) of 2.5 hours. From a tuff sample 6 cm in diameter and 10 cm in length, water content of 30%, 48 ml of water were extracted. Chemical analyses on major cations and anions indicated no significant variations in extracted pore water within these pressure ranges.

Chemical concentrations of the pore water from UZ-4 holes did not show progressive increase in concentration versus depth. For example, concentrations of calcium (Ca) and sodium (Na) are approximately 58 and 34 mg/L at 100 ft; 123 and 64 mg/L at 300 ft; and 75 and 48 mg/L at 315 ft. This implies there is some fast flow to the 315 ft depth. UZ-4 and 5 holes only penetrated to the depth of 340 ft. We are trying to squeeze on core samples of deeper holes in the future (for example, UZ-9) to get more information. For now UZ-6s (penetrated to 518 ft) is the only available core for squeeze besides UZ-4 and 5.

B605080093 B60321
PDR WASTE PDR
WM-11

2. Extraction of pore water by high-speed centrifuge:

Extractions have been carried out using a Sorvald RC-5B high-speed thermostatically-coded centrifuge of Geologic Division in Building 25, DFC. Pore water was extracted by three techniques: (1) Intact drainage (whole core segment)--cores were cut to 50 cm length (6 cm in diameter) and placed in the large centrifuge cup. Pore water was forced out by high-speed rotation through a supporting porous plate and collected in a cup at the bottom of the centrifuge tube; (2) crushed drainage--core samples were placed inside a plastic bag and crushed with a hammer to sand or pea size and transferred to a centrifuge tube, and pore water forced out as in (1); (3) immiscible displacement--A dense, immiscible fluid (halogenated hydrocarbon) was forced through the rock and the water floats to the surface. In all three techniques, centrifuge speeds used were from 4,000 to 18,000 RPM (revolutions per minute), and spin time of 2 hours.

The second method, crushed drainage, was easier in obtaining desired amount of water as compared to the first method, intact drainage. The 3rd method was abandoned due to possible contamination of water and somewhat lower extraction efficiency. The water produced by the crushed method had a somewhat higher chemical concentration compared to intact method possibly due to dissolution of additional chemicals during crushing. Chemical concentration as a function of spin speed (4,000 through 18,000 RPM) did not show systematic change. However, they were comparable in concentration and no significant difference in comparison to the concentrations obtained by triaxial compression method (need more data to prove

this point). We are currently extracting 200 ml each of pore water (from UZ-5 rocks at depth of 300 to 350 ft interval) by crushing and intact drainage methods for Carbon-14 dating.

3. Vacuum distillation of pore water (less than 11% water content):

For those core samples whose water contents were less than 11% (including those samples after squeezing and centrifuging), and could not be extracted either by triaxial compression or high-speed centrifuge, they were extracted by vacuum distillation. Water samples obtained by this method are only good for tritium and stable isotopes ($^{18}\text{O}/^{16}\text{O}$ and D/H) analyses. Twenty-five core samples from UZ-5, depth between 90-325 ft, have been extracted by this method. The amount of water obtained ranged from 20 to 60 ml. They were sent to USGS Reston Research Laboratory for tritium and stable isotope analyses. Other pore water samples obtained by squeezing were also sent to Reston Lab for stable-isotope analyses in order to validate the distillation method. (In case of high gypsum concentration, there may be some fractionation effect).

4. Gas sampling on UZ-holes:

Water vapor and CO_2 gas samplings from UZ-1 hole are continuing. It takes two 10-day rips for sampling 15 isolated intervals. Currently our approach is collecting CO_2 samples by molecular sieve and water-vapor samples by dry-ice cold trap. Carbon-dioxide samples taken last May were still sitting at University of Arizona Lab., waiting to be measured by the Tandem accelerator machine which has been sick for nearly a year.

We have acquired a new Gas chromatograph, located at Test Cell C laboratory, for measuring gas composition on site.

**O
C
R
W
M
OGR**



SCP CHAPTER 8

SECTION 8.1 - RATIONALE

- o SCHEDULED COMPLETION OF DRAFT INPUT - 02/28/86
 - WILL PROBABLY SLIP DUE TO PROGRAMMATIC CONFLICTS
 - IRC REVIEW WILL BE DONE BY TPO'S

(CONTAINS GENERIC DESCRIPTION OF APPROACH TO PERFORMANCE ALLOCATION)

SECTION 8.2 - ISSUES

- o SCHEDULED COMPLETION OF DRAFT INPUT - 02/28/86
 - WILL PROBABLY SLIP DUE TO PROGRAMMATIC CONFLICTS AND NEED TO PRESENT RESULTS OF PERFORMANCE ALLOCATION
 - IRC REVIEW WILL BE DONE BY TPO'S

(8.2.2 PRESENTS THE ISSUES RESOLUTION STRATEGY)

SECTION 8.3 - PLANNED TESTS, ANALYSES, AND STUDIES

o SCHEDULED DRAFT COMPLETION DATES:

- 8.3.1 - SITE PROGRAM 06/02/86
 - + SCHEDULE MUST BE MAINTAINED - CRITICAL PATH
 - + BASED ON USGS PROGRESS, IT IS ON SCHEDULE
- 8.3.2 - REPOSITORY PROGRAM; 8.3.3 SEAL SYSTEM PROGRAM 05/02/86
 - + DEPENDENT ON PERFORMANCE ALLOCATION SCHEDULE
 - + SNL PREDICTS 05/23/86 DATE FOR DRAFT INPUT
- 8.3.4 - WASTE PACKAGE PROGRAM 05/02/86
 - + DEPENDENT ON PERFORMANCE ALLOCATION SCHEDULE
 - + LLNL HAS NOT INDICATED THAT THE DATE WON'T BE MET
- 8.3.5 - PERFORMANCE ASSESSMENT PROGRAM 03/03/86
 - + INITIAL DRAFT WAS SUBMITTED BEFORE PERFORMANCE ALLOCATION WAS IMPLEMENTED
 - + DEPENDENT ON PERFORMANCE ALLOCATION SCHEDULE
 - + SNL PREDICTS 05/23/86 DATE FOR DRAFT INPUT

U.S. DEPARTMENT OF ENERGY

**O
C
R
W
M**

Nevada
Nuclear
Waste
Incineration
Incineration
Storage
Investigations
PROJECT
YUCCA
MOUNTAIN

SCP CHAPTER 8 (CONT)

-
- o GUIDANCE ON 8.3 IS IN REVIEW
 - RUNNING GUIDANCE FOR LAST THREE MONTHS
 - WORKING GROUP MEETING SCHEDULED FOR MARCH ___ TO REVIEW GUIDANCE AND RECRUIT DISCIPLES
 - EXAMPLES AND VISITATIONS

 - o EACH ISSUE WRITE-UP IN 8.3 WILL INCLUDE ITS ISSUE RESOLUTION STRATEGY



SCP CHAPTER 8 (CONT)

SECTION 8.4 - SITE PREPARATION ACTIVITIES

- o SCHEDULED COMPLETION OF DRAFT INPUT 03/28/86
 - INITIAL DRAFT SUBMITTED BEFORE NEW ESF DESIGN EXERCISE WAS BEGUN
 - DATE IS STILL GOOD; CHANGES MAY OCCUR UP UNTIL HQ REVIEW (6/9) AS ESF DESIGN MATURES

SECTION 8.5 SCHEDULE AND MILESTONES

- o SCHEDULED COMPLETION OF DRAFT INPUT 06/02/86
 - TRACKING WITH 8.3

SECTION 8.6 QUALITY ASSURANCE PROGRAM

- o HQ REVIEW MEETING 03/05/86

SECTION 8.7 DECONTAMINATION AND DECOMMISSIONING

- o INITIAL DRAFT SUBMITTED WITH INITIAL 8.4
 - TRACKING WITH 8.4; WILL BE SUBMITTED FOR IRC 03/28/86

**OC
RW
M**



DEFINITIONS TO BE USED
IN SCP SECTION 8.3

PROGRAM (GENERIC)

- o 3RD LEVEL ELEMENTS IN SCP-A0 FOR 8.3
 - E.G. 8.3.1 SITE PROGRAM
 - 8.3.2 REPOSITORY PROGRAM

PROGRAM (SPECIFIC)

- o 4TH LEVEL ELEMENTS IN SCP-A0 FOR 8.3
- o COMPRISED OF 2 OR MORE RELATED INVESTIGATIONS
- o CORRESPOND TO NNWSI ISSUES
 - E.G. 8.3.1.2 GEOHYDROLOGY (POSTCLOSURE) ISSUE 1.1
 - 8.3.2.9 TECHNICAL FEASIBILITY (PRECLOSURE) ISSUE 4.7

**O
C
R
W
M
OGR**

Nevada
Wuclear
Site
I storage
I nvestigations
PROJECT
YUCCA MOUNTAIN

DEFINITIONS (CONT)

INVESTIGATION

- o 1ST MAJOR SUBDIVISION OF A SPECIFIC PROGRAM
- o COMPRISED OF 2 OR MORE RELATED STUDIES
- o CORRESPOND TO NNWSI INFORMATION NEEDS
 - E.6. 8.3.1.2.1 DESCRIPTION OF THE REGIONAL HYDROLOGIC SYSTEM
(INFO NEED 1.1.1)
 - 8.3.2.9.4 POTENTIAL IMPACTS OF ROCK CHARACTERISTICS ON DESIGN
(INFO NEED 4.7.4)
- o THIS IS THE LEVEL TO WHICH WE ARE COMMITTED TO WRITE DETAIL IN THE SCP; INFORMATION BELOW THIS LEVEL WILL BE SUMMARIZED AND TABULATED IN THE SCP

STUDY

- o REFERS TO A COMBINATION OF TESTS AND ANALYSES WHICH DEAL WITH A SINGLE OBJECTIVE, OR SEVERAL RELATED OBJECTIVES

ANALYSIS

- o REFERS TO AN ASSESSMENT OF TEST RESULTS THROUGH CALCULATIONS, MODELING, OR TECHNICAL JUDGEMENT

O
C
R
W
M
OGR

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

YUCCA
MOUNTAIN

DEFINITIONS (CONT)

TEST

- o REFERS TO A COMBINATION OF PROCEDURES WHICH ARE USED FOR THE IDENTIFICATION, MEASUREMENT, OR EVALUATION OF A QUALITY, CHARACTERISTIC, OR PROPERTY OF A MATERIAL OR SYSTEM THAT PRODUCES DATA OR INFORMATION THROUGH ONE OR MORE EXPERIMENTS

PROCEDURE

- o DESCRIBES THE DETAILED STEPWISE PROCESS WHICH SPECIFIES HOW A TEST ACTUALLY BE CONDUCTED (E.G. ASTM STANDARDS)

EXPERIMENT

- o OPERATION CARRIED OUT UNDER CONTROLLED CONDITIONS AS SPECIFIED IN APPLICABLE PROCEDURES TO ESTABLISH CHARACTERISTICS OR VALUES OF THE QUALITY, CHARACTERISTIC, OR PROPERTY OF A MATERIAL OR SYSTEM BEING EXAMINED

U.S. DEPARTMENT OF ENERGY

O
C
R
W
M

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT
JULIA
MOUNTAIN

SCP
DATA & DESIGN CHAPTERS

OGR

CHAPTER 1 - GEOLOGY (USGS)

- 1.3.2.5 - (SNL), COORDINATED THROUGH USGS
 - 1.6 - (F&S), ALMOST COMPLETE
 - 1.7 - (SAIC), ALMOST COMPLETE
 - REST OF CHAPTER - (USGS), COORDINATED BY D. SCHLEICHER
- } TO USGS WHEN AVAILABLE

CHAPTER 2 - GEOENGINEERING (SNL)

- o SAIC AND SNL'S COMMENT RESPONSES TO DOE/HQ REVIEW BEING REVIEWED AND FINALIZED AT SAIC
- o WHEN COMPLETED (MARCH/APRIL), WILL BE SENT TO TASK LEADERS
- o MINOR INPUT REQUIRED FROM WMPO AND SAIC



SCP
DATA & DESIGN CHAPTERS

CHAPTER 3 - HYDROLOGY (USGS)

- 3.3, 3.5, 3.8, 3.9.7 - (SAIC), COMPLETE
- 3.2 - (SNL), NEEDS TO BE COORDINATED THROUGH USGS
- REST OF CHAPTER - (USGS)
 - SATURATED ZONE SECTIONS FOR PROJECT MINI-REVIEW ON MARCH 7
 - UNSATURATED ZONE NOT COMPLETE
 - 3.0, 3.10 NEED TO BE COORDINATED BY USGS

CHAPTER 4 - GEOCHEMISTRY (LOS ALAMOS)

- o IN DOE/HQ REVIEW PERIOD; MEETING MARCH 6-7
- o DOE/HQ REVIEW COMMENTS MAY BE SUBSTANTIVE; MAY NEED TO ADJUST SCHEDULE
- o DOE/HQ REVIEWERS TO SUGGEST AREAS TO BE CUT



SCP
DATA & DESIGN CHAPTERS

CHAPTER 5 - CLIMATE (SAIC/IUSGS)

- 5.1 - (SAIC), ALMOST COMPLETE
- 5.2 - (IUSGS), BEING HEAVILY MODIFIED BASED ON L. BENSON'S COMMENTS
DURING IRC MEETING
 - ANOTHER IRC REVIEW MAY BE REQUIRED FOR 5.2
 - MAY REQUIRE NEW SCHEDULE
- 5.0, 5.3 - PREPARED BY SAIC AND IUSGS AS APPROPRIATE
 - FINAL COORDINATION BY SAIC

CHAPTER 6 - CONCEPTUAL DESIGN OF A REPOSITORY (SNL)

- o MEETING IN ALBUQUERQUE EARLY MARCH CONFIRMED STATUS OF SCP AND CDR
- o NO CHANGE IN PRESENT SCP DEVELOPMENT
- o PRESENT SCHEDULE NEEDS TO BE MET

U.S. DEPARTMENT OF ENERGY

O
C
R
W
M

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

VUCCA
MOUNTAIN

SCP
DATA & DESIGN CHAPTERS

CHAPTER 7 - WASTE PACKAGE DESIGN (LLNL)

- o DOE/HQ CHANGES TO SCP ANNOTATED OUTLINE SHOULD BE MINOR
- o CHANGES ALREADY DISCUSSED WITH M. REVELLI; INVOLVE BETTER TIES BETWEEN 7.5 AND 8.3.4 BASED ON I.H.
- o PRESENT SCHEDULE UNCERTAIN; DISCUSSIONS TO BE HELD BETWEEN SCPMG AND LLNL

Feb. 26, 1986
9:00 a.m.

SCP SCHEDULE

Chapter/ Section	Draft Input	Internal Review		CRP 1		HQ Review		CRP 2
		Distr.	Mtg.			Distr.	Mtg.	
2	done	done	done	done	done	done	done	started - 4/1
8.6	done	done	done	started	2/21	2/24	3/5	3/10 - 4/28
4	done	done	done	started	2/21	2/24	3/6-7	3/10 - 4/28
7	done	done	done	started	3/28	3/31	4/10-11	4/14 - 6/6
5	1/17	2/3	2/14	2/17 -	3/28	3/31	4/9	4/14 - 6/6
8.1, 8.2	2/28	3/10	3/20-21*	3/24 -	5/2	5/5	5/15-16	5/19 - 6/27
8.3.5	3/3	3/17	4/1-2	4/3 -	5/2	5/5	5/14	5/19 - 6/27
6	done	done	done	started	5/23	5/26	6/5-6	6/9 - 7/18
8.4, 8.7	3/28	4/21	4/29-30	5/5 -	6/6	6/9	6/18	6/23 - 8/1
3	4/11	4/21	5/1-2	5/5 -	6/6	6/9	6/19-20	6/23 - 8/1
1	5/2	5/19	5/27-29	6/2 -	8/1			
8.3.4	5/2	5/19	5/27-29	6/2 -	8/1			
8.3.2, 8.3.3	5/2	5/19	5/28-30	6/2 -	8/1			
8.3.1, 8.5	6/2	6/16	6/24-27	6/30 -	8/8			

Total Document Consolidation 8/4 - 8/8
 HQ/Internal Reviews in L.V. and
 Comment Clarification & Consolidation 8/11 - 8/22
 Comment Resolution 8/25 - 9/12
 HQ Approval of draft consolidated
 comment copy in L.V.
 Production 9/15 - 10/3
 HQ Concurrence 10/6 - 10/10
 Final Camera Ready Production 10/13 - 11/21/86
 Final Reproduction 11/24 - 12/19/86
 Delivery to NRC 12/22/86

* TPO Review

**ORR
W
M**

Nevada
Wuclear
Site
Investigations
PROJECT

**YUCCA
MOUNTAIN**

EA UPDATE

-
- o HQ AUDIT COMMENTS RECEIVED ON FEBRUARY 7, 1986
 - o REVISIONS PER AUDIT COMMENTS SENT TO HQ ON FEBRUARY 20, 1986
 - o TASKS TO COMPLETE
 - o HQ AND NNWSI SCHEDULE TO COMPLETE
 - o DISTRIBUTION PLAN FOR EAs
 - o REMAINING UNCERTAINTIES

O
C
R
W
M
OGR



EA UPDATE

HQ AUDIT COMMENTS

- o TRANSPORTATION: DELETE INFORMATION REGARDING MRS
- o ARCHAEOLOGY: INSERT ONE WORD
- o METEOROLOGY: MOVE INFORMATION FROM CHAPTER 3 AND COMBINE WITH CHAPTER 6 INFORMATION. PRECLOSURE MET GUIDELINE.
- o CHAPTER 7 REQUEST: LABOR FORCE BREAK-OUT INTO:
 - RADIATION AND NON-RADIATION WORKERS
 - SURFACE AND UNDERGROUND WORKERS

O
C
R
W
M

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

YUCCA
MOUNTAIN

EA UPDATE

OGR

REVISIONS PER AUDIT COMMENTS

- o SENT FEBRUARY 20, 1986, PER HQ REQUEST
- o RECEIVED BY HQ FEBRUARY 21 (ONLY REVISIONS RECEIVED AS OF 2/24)
- o PACKAGE CONSISTED OF:
 - ONE PAGE REVISION TO CHAPTER 5 (ARCHAEOLOGY)
 - THREE PAGE REVISION TO CHAPTER 6 (METEOROLOGY)
 - PAGES 95 TO 156 REPRINTED IN CHAPTER 5 (TRANSPORTATION)

**O
C
R
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

0 YUCCA
MOUNTAIN

EA UPDATE

TASKS TO COMPLETE

- o REFERENCE VERIFICATION
- o EA INDEX
- o DISTRIBUTION OF REFERENCES
- o ADMINISTRATIVE RECORD
 - CRD UPDATES
 - REFERENCES
 - WMPO LETTERS REVIEW
- o "LESSONS LEARNED" WORKSHOP
- o PROVIDE SUPPORT AT BRIEFINGS/HEARINGS

**ORCO
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

EA UPDATE

HQ AND NNWSI SCHEDULE TO COMPLETE

- o HQ RECEIVES AUDIT REVISIONS 2/21
- o HQ COMBINES PO AND HQ MATERIALS 2/21 TO 2/27
- o EAs IN RUSHE'S OFFICE; PREPARE CONCURRENCE MEMO 2/28 TO 3/06

- o DOE CONCURRENCE REVIEW 3/07 TO 3/21
- o HQ REQUEST FOR REVISION PER CONCURRENCE REVIEW? 3/22
- o EAs TO NAS FOR REVIEW END OF MARCH

- o POs PREPARE FINAL CAMERA-READY EAs 3/22 TO 4/04
- o SEND FINAL CAMERA-READY EAs TO PRINTER 4/07
- o DISTRIBUTE FINAL EAs 4/21
 - DISTRIBUTE REFERENCES
 - EA INDEX COMPLETE
 - REFERENCE VERIFICATION COMPLETE
 - ADMINISTRATIVE RECORD COMPLETE
 - BRIEFINGS/HEARINGS MATERIAL PREPARED

**O
C
R
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

EA UPDATE

OGA

DISTRIBUTION PLANS FOR EA

- o HQ REQUEST FOR PO REVIEW OF OUTREACH PLANS
- o NNWSI RECOMMENDATIONS
 - HQ
 - CONGRESSIONAL LIAISON
 - NATIONAL NEWS RELEASES
 - NATIONAL PRESS CONFERENCES
 - ADVISORIES TO OTHER FEDERAL AGENCIES
 - POs
 - LOCAL CONGRESSIONAL OFFICES
 - STATE EXECUTIVE AND LEGISLATIVE BRANCHES
 - KEY STATE AND LOCAL CONTACTS
- o SPECIFICS
 - ONE WEEK PRIOR TO RELEASE, POs FINALIZE MAILING LABELS AND SEND THEM TO HQ.
HQ MAILS EAs.
 - TWO DAYS PRIOR TO RELEASE, HQ PROVIDES 50 COPIES OF EA TO WMPO FOR KEY
STATE/LOCAL STAFF
 - WMPO DOES NOT PROPOSE TO HOLD BRIEFINGS/HEARINGS ON EA RELEASE

**O
C
R
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

EA UPDATE

OGR

REMAINING UNCERTAINTIES

- o TECHNICAL ASSISTANCE TO AUTHORS OF CHAPTER 7?
- o CHAPTER 7 REVIEW?
- o NAS REVIEW?
- o REFERENCE DISTRIBUTION?
- o CRD CHAPTERS 2 AND 3 REVIEW?



NUCLEAR WASTE PROJECT OFFICE

Capitol Complex
Carson City, Nevada 89710
(702) 885-3744

MEETING

COMMISSION ON NUCLEAR PROJECTS
FRIDAY, MARCH 14, 1986
LAS VEGAS CITY COUNCIL CHAMBERS
400 STEWART STREET
LAS VEGAS, NEVADA 89101
9:30 A.M.

- 1) Call to Order and Opening Remarks
Chairman Grant Sawyer
- 2) Approval of Minutes of February 7, 1986 Meeting
- 3) Executive Director Report
Robert Loux
 - a) Program Update
 - b) Socio-Economic Program Update
Joseph Strolin, Chief of Planning
 - c) Transportation Program Update
Russ di Bartolo, Planner/Researcher
 - d) Public Information Program Update
Russ Nielsen, Public Affairs Manager
- 4) Review and Discussion of Attorney General's Opinion
Harry Swainston, Deputy Attorney General
- 5) Discussion and Consideration of Administration Regulations
 - a) Approval of Minutes from March 10, 1986 Subcommittee Meeting
 - b) Report and Recommendation of Subcommittee Activities
Commissioner Anne Peirce

- c) Notice of Intent to Adopt Regulations
 - d) Discussion and Consideration of Regulations
Chairman Grant Sawyer
- 6) Discussion and Recommendation of Executive Director Candidates
- a) Approval of Minutes of February 28, 1986
Subcommittee Meeting
 - b) Report and Recommendations of Subcommittee
Commissioner Lurie
 - c) Recommendation of Candidates for Executive
Director to Governor
Chairman Grant Sawyer
- 7) Overview and Status of Nevada's Independent Technical Study
and Review Program
Carl Johnson, Chief-Technical Programs
- 8) Overview and Status of the Renewal of Price/Anderson Act
James Davenport, Special Deputy Attorney General
- 9) New Business
- a) Public Survey Activity Discussion
 - b) Other Business
Chairman Grant Sawyer
- 10) Public Comment
- 11) Schedule Next Meeting
- 12) Adjournment

NRC-NNWSI PROJECT MANAGEMENT MEETING SUMMARY

February 19-20, 1986

Las Vegas, Nevada

Attendees

A list of attendees and their organizational affiliations is attached as Enclosure 1.

Background/Facts

An agenda is attached as Enclosure 2. Copies of materials used during the discussions are attached as Enclosure 3.

Observations/Agreements

The NRC and NNWSI Project observations and agreements are listed below.

1. The NNWSI project appreciated the opportunity to conduct these discussions with the NRC and strongly endorses the position that such meetings should continue to be held on a quarterly basis.
2. The NRC considers that the open and frank nature of these discussions has provided the NRC with enhanced insight into the NNWSI Project's most immediate major interests and concerns into how and when various forms of NNWSI Project/NRC interactions might be of most benefit in helping to address such concerns. The NRC further considers that meetings like this should take place quarterly.
3. NRC agreed to place the NNWSI Project on a mailing list for NNWSI related documents that are placed in the NRC Public Document Room.
4. Both NRC and the NNWSI Project agreed that the utility of technical meetings anticipated for calendar year 1986 would be significantly enhanced through recognition of the need to relate the meeting schedules and topics to the Site Characterization Plan preparation process. In addition, NRC

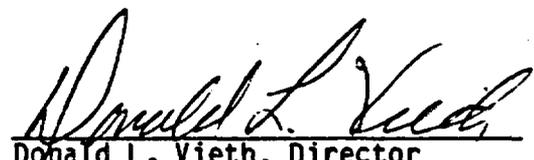
and the NNWSI Project agreed that site specific technical meetings covering Exploratory Shaft Testing, the Issues Hierarchy, Performance Allocation, Performance Assessment Seismic/Tectonics, a follow-up meeting on Exploratory Shaft Design, and Hydrology/Geology would be appropriate topics for future 1986 meetings. The potential that generic meetings may be conducted on certain of the above subjects was recognized. Discussions on the relative effectiveness of technical meetings highlighted the need for such meetings to produce agreements necessary to enable development of positions, strategies and testing plans.

5. NRC noted the need for expanded use of peer and expert review panels by the NNWSI project. The NNWSI Project recognizes this need and is pursuing the matter.
6. Extensive discussions were held on the points regarding the documentation, procedures, and storage of core raised in J. Linehan's November 18, 1985, to D. L. Vieth. Included were the criteria for admissibility as evidence in a licensing hearing, custodial approaches and precedents as used in the nuclear industry, and a general discussion of current core library practice and status. The NNWSI Project would appreciate any regulatory or precedence guidance NRC can provide in this matter.
7. Tentative agreement was reached that a presentation, by NRC QA representatives, would be made at the Technical Project Officer's meeting in Las Vegas during the week of March 24. Appendix 7 discussions relative to the core library may continue at that time.
8. The NNWSI Project agreed that Project facilities and laboratories should be open on a continuing basis to access by the NRC-OR, and personnel assigned to his staff. Necessary continuing access arrangements will be made by DOE/WMPO. NRC-OR visits to participants' facilities will be coordinated with WMPO by the OR. The NRC-OR is tentatively planning to visit LLNL early in April followed by visits to SNL and Los Alamos in May and June respectively.

9. NRC agreed to check on the status and timing of the NRC QA review of the NNWSI Project that was proposed by DOE/HQ to be conducted prior to SCP issuance.
10. The status of NNWSI Project activities subsequent to the December, 1985 Seismic/Tectonic meeting with NRC was discussed. NNWSI is looking forward to receiving NRC's input relative to the CCDF concept and definitions as agreed to in the meeting. In addition, it was noted that open items for NNWSI and NRC remain from the August Exploratory Shaft Design meeting.
11. Given the content of Section 114 of the NWSA, the NNWSI Project would appreciate any guidance the NRC can provide relative to EIS content that would facilitate "adoption" of the EIS by the Commission.
12. The NNWSI Project recently provided NRC with a copy of NNWSI-SOP-03-03 ("Acceptance of Data or Data Interpretation not developed under the NNWSI QA Plan," 1/31/86).

An alternative methodology for confirmation of data collected under other than Level I QA may involve validation of such data by a limited amount of testing conducted under more stringent QA controls. The NNWSI Project would appreciate NRC consideration of this approach including the methodology for determining the extent of verification (confirmation) testing that would be appropriate.


Newton K. Stablein
Division of Waste Management
U.S. NRC
2/21/86


Donald L. Vieth, Director
Waste Management Project Office
DOE/NV
2/21/86

Enclosure 1

NNWSI Project/NRC Management Meeting
Las Vegas, Nevada
February 19-20, 1986

Attendees

N. K. Stablein - NRC/NMSS
P. T. Prestholt - NRC-OR
D. L. Vieth - NNWSI/DOE
M. B. Blanchard - NNWSI/DOE
J. S. Szymanski - NNWSI/DOE
U. E. Clanton - NNWSI/DOE
James Blaylock - NNWSI/DOE
M. D. Voegele - NNWSI/SAIC
S. H. Klein - NNWSI/SAIC
Stephen Metta - NNWSI/SAIC
C. G. Pflum - NNWSI/SAIC
M. A. Gora - NNWSI/SAIC
D. M. Dawson - NNWSI/SAIC
M. I. Foley - NNWSI/SAIC
T. A. Grant - NNWSI/SAIC

Enclosure 2

AGENDA

February 19-20, 1986
NNWSI Project Meeting with N. K. Stablein
Las Vegas, Nevada

<u>2/19/86</u>	<u>DOE Conference Room</u>
1:15 P.M.	Introduction & Review of Agenda
1:30 P.M.	NNWSI Project/NRC Information Exchange Status and Open Items
2:30 P.M.	NNWSI Project/NRC Interactions
3:30 P.M.	Environmental Concerns and Site Suitability Determination
4:30 P.M.	Adjourn
<u>2/20/86</u>	<u>SAIC - Room 437</u>
8:30 A.M.	Status of Seismic/Tectonic Paper & Evaluation Plans
9:45 A.M.	License Application Format & Content
10:30 A.M.	Quality Assurance & Data Confirmation
12:00 A.M.	Lunch
<u>2/20/86</u>	<u>DOE Conference Room</u>
1:00 P.M.	Site Characterization Plan Status & Approach
3:00 P.M.	Closing Discussion and Preparation of Summary

U.S. DEPARTMENT OF ENERGY

**OC
RC
WM**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

NWCA
MOUNTAIN

**NNWSI PROJECT PRIORITIES
FY 1986**

ADMINISTRATIVE/PROJECT MANAGEMENT

- COMPLETE STAFFING OF WMPO
- CREATE SEB AND ISSUE RFP FOR T&MSS CONTRACTOR
- CREATE SEB AND ISSUE RFP FOR A&E
- COMPLETE REVIEW AND ISSUE GRANT TO STATE
- COMPLETE PREPARATION OF FY 1988 WPAS AND BUDGET REVIEW
- GET USGS SITUATION RESOLVED AND WORKING SMOOTHLY
- GET RECORDS MANAGEMENT SYSTEM FULLY OPERATIONAL
- IMPLEMENT PERFORMANCE MEASUREMENT SYSTEM
- COMPLETE AND ISSUE PROJECT MANAGEMENT PLAN

O
C
R
W
M
OGR

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

(1) NRC
MAINTAIN

**NNWSI PROJECT PRIORITIES
FY 1986**

CONTINUED

REGULATORY

- UPGRADE QA PROGRAM TO MEET NRC REQUIREMENTS AND EXPECTATIONS
- COMPLETE, IN SUCCESSFUL FASHION, QA AUDIT OF PROJECT BY NRC
- COMPLETE 6 WORKSHOPS WITH NRC
- COMPLETE SEISMIC/TECTONIC POSITION PAPER
- RESOLVE ISSUES IDENTIFIED DURING EXPLORATORY SHAFT DESIGN WORKSHOP

PROGRAMMATIC

- FULLY IMPLEMENT CONFIGURATION MANAGEMENT CONTROLS
- COMPLETE AND IMPLEMENT SEMP
- COMPLETE AND ISSUE WASTE PACKAGE POST EMPLACEMENT COMPLIANCE STRATEGY
- COMPLETE AND ISSUE WASTE PACKAGE DEVELOPMENT PLAN
- COMPLETE PREPARATION OF COPPER REPORT FOR CONGRESS
- REVISE AND COMPLETE WASTE PACKAGE SPECIFICATION

**CO
R
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

II WASTE MAINTENANCE

**NNWSI PROJECT PRIORITIES
FY 1986**

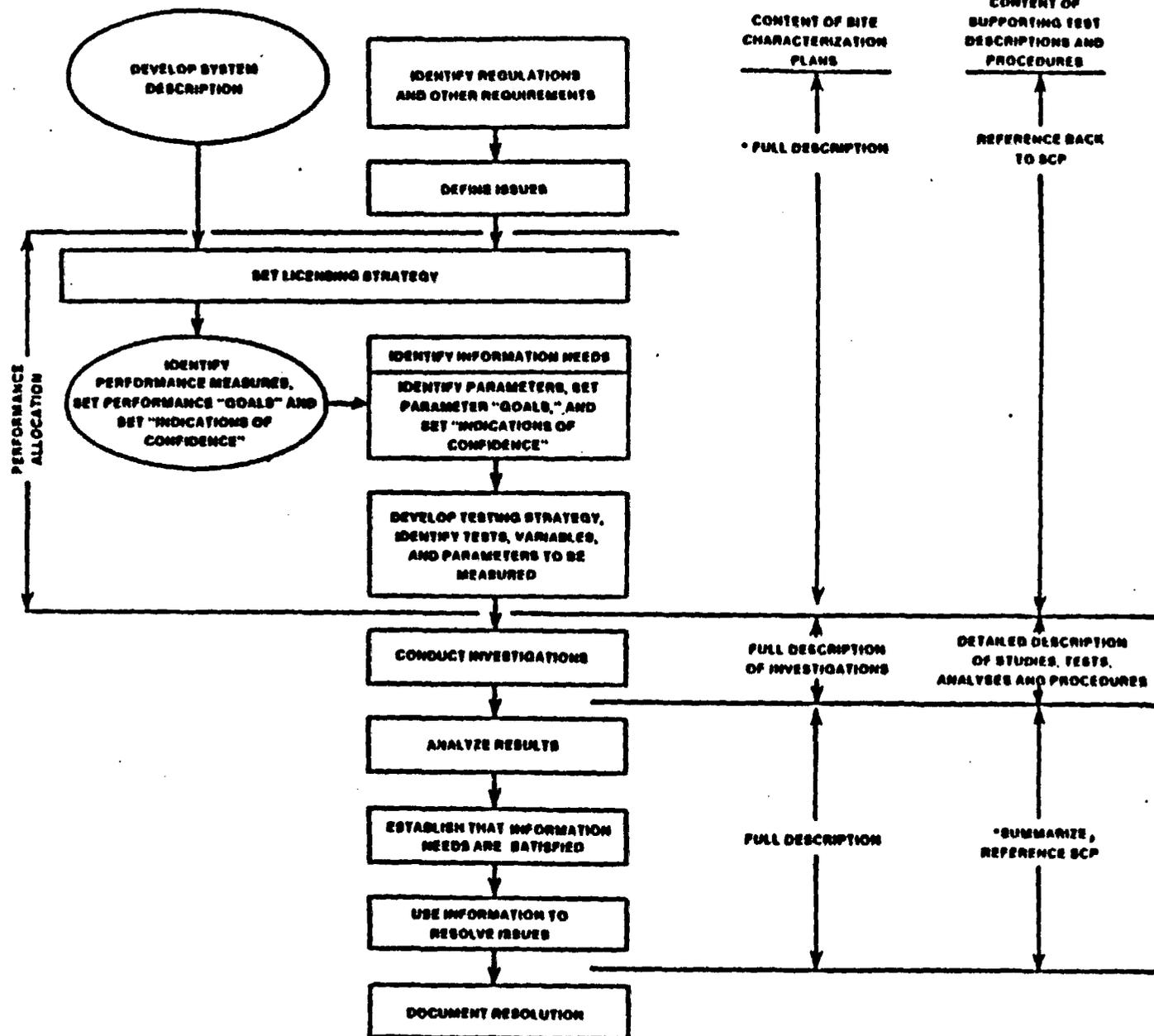
CONTINUED

PROGRAMMATIC

- RESOLVE ISSUE RELATING TO CANDIDATE ALLOYS FOR WASTE PACKAGE
- INITIATE ADVANCED CONCEPTUAL DESIGN OF WASTE PACKAGE
- COMPLETE SCP CONCEPTUAL DESIGN REPORT
- COMPLETE REPOSITORY SUBSYSTEM DESIGN REQUIREMENTS
- INITIATE REPOSITORY ADVANCED CONCEPTUAL DESIGN
- FINALIZE ISSUES HIERARCHY
- IMPLEMENT PERFORMANCE ALLOCATION
- PREPARE SCP WITH OBJECTIVE OF DECEMBER RELEASE
- COMPLETE EXPLORATORY SHAFT DEFINITION (TITLE II) DESIGN REPORT
- COMPLETE AND ISSUE EXPLORATORY SHAFT BID PACKAGE
- MAKE DECISION ON CORE LIBRARY AND RESOLVE CORE HANDLING PROBLEMS
- COMPLETE EEMP AND ISSUE ASAP AFTER PRESIDENTIAL APPROVAL OF SITE RECOMMENDATION
- SUPPORT EIS SCOPING HEARINGS IN NEVADA
- COMPLETE EA AND ISSUE PER GUIDANCE OGR

COMMON ISSUE RESOLUTION

LEVEL OF DETAIL



* LEVEL OF INFORMATION PRESENTED IN THIS SCP WILL BE BASED ON DATA AVAILABLE AT EACH PROJECT AT THE TIME OF SCP PREPARATION. LEVEL OF INFORMATION EXPECTED TO VARY AMONG PROJECTS DUE TO DIFFERING STATUS OF PROJECT STUDIES.

SCP SCHEDULE

CHAPTER/ SECTION	DRAFT INPUT	INTERNAL REVIEW		CRP 1		HQ REVIEW		CRP 2
		DISTR.	MTG.	DISTR.	MTG.	DISTR.	MTG.	
2	DONE	DONE	DONE	DONE	DONE	DONE	DONE	STARTED -
8.6	DONE	DONE	DONE	STARTED	2/21	2/24	3/5	3/10 -
4	DONE	DONE	DONE	STARTED	2/21	2/24	3/6-7	3/10 -
7	DONE	DONE	DONE	STARTED	3/28	3/31	4/10-11	4/14 -
5	1/17	2/3	2/14	2/17 -	3/28	3/31	4/9	4/14 -
8.1, 8.2	2/28	3/10	3/20-21*	3/24 -	5/2	5/5	5/15-16	5/19 -
8.3.5	3/3	3/17	4/1-2	4/3 -	5/2	5/5	5/14	5/19 -
6	DONE	DONE	DONE	STARTED	5/23	5/26	6/5-6	6/9 -
8.4, 8.7	3/28	4/21	4/29-30	5/5 -	6/6	6/9	6/18	6/23 -
3	4/11	4/21	5/1-2	5/5 -	6/6	6/9	6/19-20	6/23 -
1	5/2	5/19	5/27-29	6/2 -	8/1			
8.3.4	5/2	5/19	5/27-29	6/2 -	8/1			
8.3.2, 8.3.3	5/2	5/19	5/28-30	6/2 -	8/1			
8.3.1, 8.5	6/2	6/16	6/24-27	6/30 -	8/8			
TOTAL DOCUMENT CONSOLIDATION				8/4	-	8/8		
HQ/INTERNAL REVIEWS IN L.V. AND COMMENT CLARIFICATION & CONSOLIDATION				8/11	-	8/22		
COMMENT RESOLUTION				8/25	-	9/12		
HQ APPROVAL OF DRAFT CONSOLIDATED COMMENT COPY IN L.V.								
PRODUCTION				9/15	-	10/3		
HQ CONCURRENCE				10/6	-	10/10		
FINAL CAMERA READY PRODUCTION				10/13	-	11/21/86		
FINAL REPRODUCTION				11/24	-	12/19/86		
DELIVERY TO NRC				12/22/86				

* TPO REVIEW

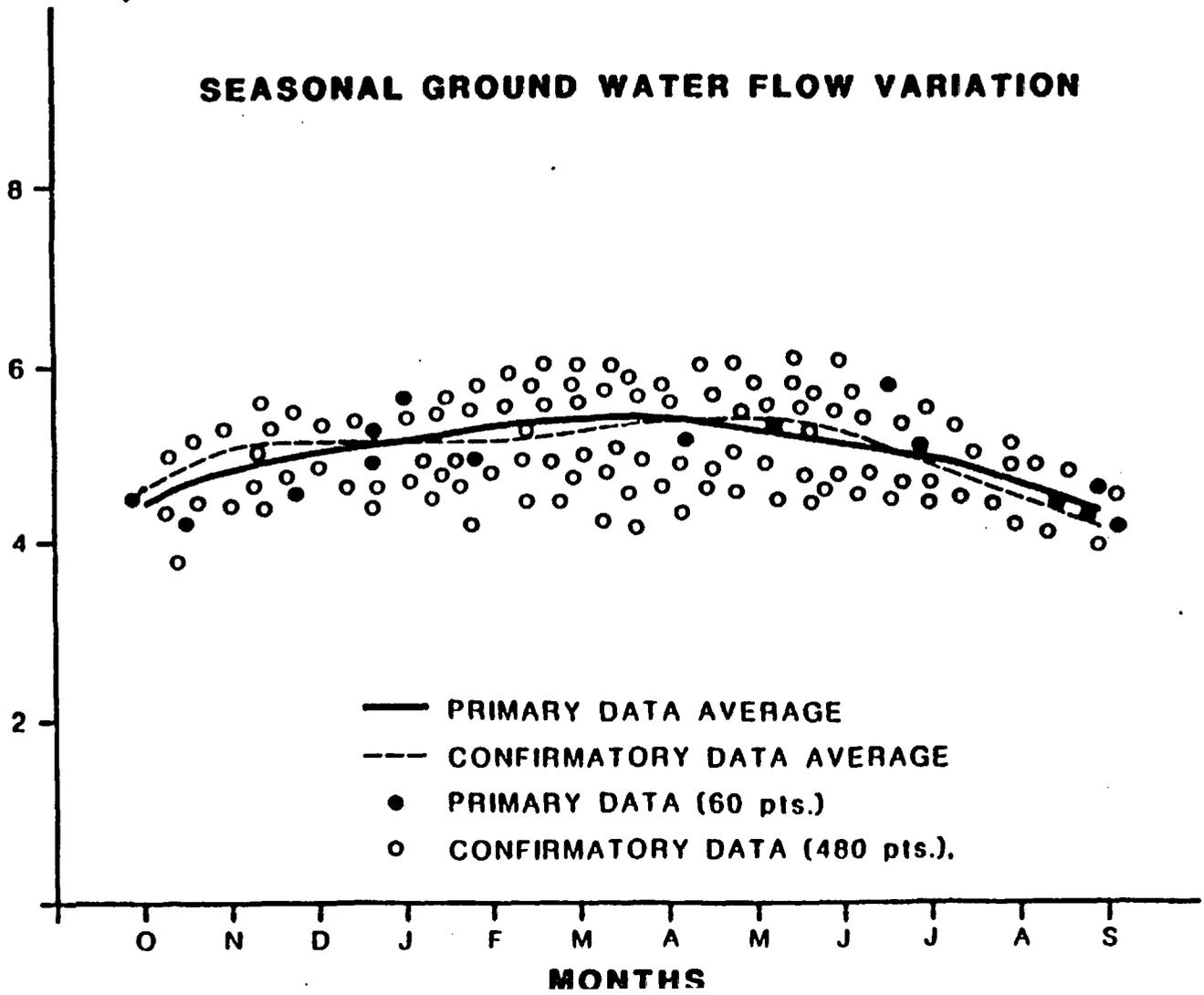
W
D
O
M
O
G
R

evada
uclear
aste
orage
Investigations
PROJECT
YUCCA
MOUNTAIN

DATA ACCEPTANCE EXAMPLE

GROUND WATER FLOW (GPM) AT 500 FT
TEST HOLE 322E

SEASONAL GROUND WATER FLOW VARIATION



TPO MEETING
FEB. 26, 1986

PERFORMANCE ALLOCATION WORKSHOP: FEBRUARY 20-21

PURPOSE OF MEETING

- o DEVELOP PROJECT-WIDE UNDERSTANDING OF AN ISSUE RESOLUTION STRATEGY THAT IS BASED ON PERFORMANCE ALLOCATION

- o DEVELOP CONCRETE PLANS FOR HOW PERFORMANCE ALLOCATION WILL BE USED TO GUIDE DEVELOPMENT OF CHAPTER 8 OF THE SCP

2-20-86
M RICHARD WMDN

FEBRUARY 20-21 PERFORMANCE ALLOCATION WORKSHOP

ATTENDEES

SNL: ~ 10

LANL: 7

LLNL: 2

USGS: 5

SAIC: ~ 17

WMPO: 5

SRPO/ONWI: 2

PERFORMANCE ALLOCATION WORKSHOP 02/20/86
ATTENDANCE LIST

<u>NAME</u>	<u>ORGANIZATION</u>	<u>PHONE</u>
Felton Bingham	SNL	FTS 844-8816
Candace Biddison	SAIC	FTS 575-0078
David Jorgenson	SAIC	FTS 575-1738
Steve Schroedl	SAIC	FTS 575-1417
Dale Wilder	LLNL	FTS 532-6908
Jim Danna	SAIC	FTS 575-1418
Michael Teubner	SAIC	FTS 575-1741
Al Stevens	SNL	FTS 844-8273
Susan Jones	SAIC	FTS 575-0841
Bob Raup	USGS	FTS 776-1253
Bill Dudley	USGS	FTS 776-4920
Virginia Oversby	LLNL	FTS 543-2228
Scott Sinnock	SNL	FTS 846-0081
Martin Tierney	SNL	FTS 846-4921
Steve Mattson	SAIC	FTS 575-1204
George Dymmel	SAIC	FTS 575-1217
Tom Lin	SNL	FTS 846-1816
Paul Kaplan	SNL	FTS 846-4689
H. Z. Dokuzoguz	SAIC	FTS 575-1863
John Rotert	WMPO	FTS 575-1588
R. W. Klingensmith	Battelle-ONWI	FTS 976-7478
Maxwell Blanchard	WMPO	FTS 575-1091
Jerry Kerrisk	LANL	FTS 843-3348
Julie Canepa	LANL	FTS 843-0180
Gail A. Cederberg	LANL	FTS 843-1498
Tom Blejwas	SNL	FTS 846-0541
Elmer Klavetter	SNL	FTS 846-9647
Joe D'Lugosz	WMPO	FTS 575-1862
Paul Aamodt	LANL	FTS 843-7960
Joe Tillerson	SNL	FTS 844-5575
Bill Wilson	USGS	FTS 776-5044
Tim Barbour	SAIC	303 231-9094
Craig Bentley	USGS	FTS 776-4922
Gerald DePoorter	LANL	FTS 843-1033
Kimberly Thomas	LANL	FTS 843-4546
Bruce Crowe	LANL	FTS 843-4498
Bob Zimmerman	SAIC	FTS 575-1418
David Dawson	SAIC	FTS 575-0079
David Goings	SAIC	FTS 575-1416
U-Sun Park	SAIC	FTS 575-1408
August Matthusen	SAIC	FTS 575-1409
Gregory Fasano	SAIC	FTS 575-0074
Jean L. Younker	SAIC	FTS 575-1461
Nancy Hayden	SNL	FTS 846-1815
Lynn Hoffman	SAIC	FTS 575-0851
Don Livingston	WMPO	FTS 575-1590

MEETING SYNOPSIS

- | | | | |
|--------|---------|--|------------------|
| THURS. | 8 - 1 | DISCUSSION OF PERFORMANCE ALLOCATION STRATEGY
O WHERE IT FITS IN CHAPT. 8
O RELATIONSHIP TO ISSUES HIERARCHY | F. BINGHAM, SNL |
| | 2 - 4 | PERFORMANCE ALLOCATION EXAMPLE FOR ISSUE 1.15
GROUNDWATER TRAVEL TIME | S. SINNOCK, SNL |
| | 4 - 6 | PERFORMANCE ALLOCATION EXAMPLE FOR ISSUE 4.7
TECHNICAL FEASIBILITY OF REPOSITORY CONSTRUCTION | A. STEVENS, SNL |
| FRI. | 8 -10 | PERFORMANCE ALLOCATION EXAMPLE FOR ISSUE 1.16
RELEASE TO THE ACCESSIBLE ENVIRONMENT | M. TIERNEY, SNL |
| | 10 - 12 | WASTE PACKAGE ISSUE RESOLUTION STRATEGY
CONTAINMENT & EBS RELEASE | V. OVERSBY, LLNL |
| | 1 - 4 | PLANNING SESSION FOR PERFORMANCE ALLOCATION
WORKSHOPS | |

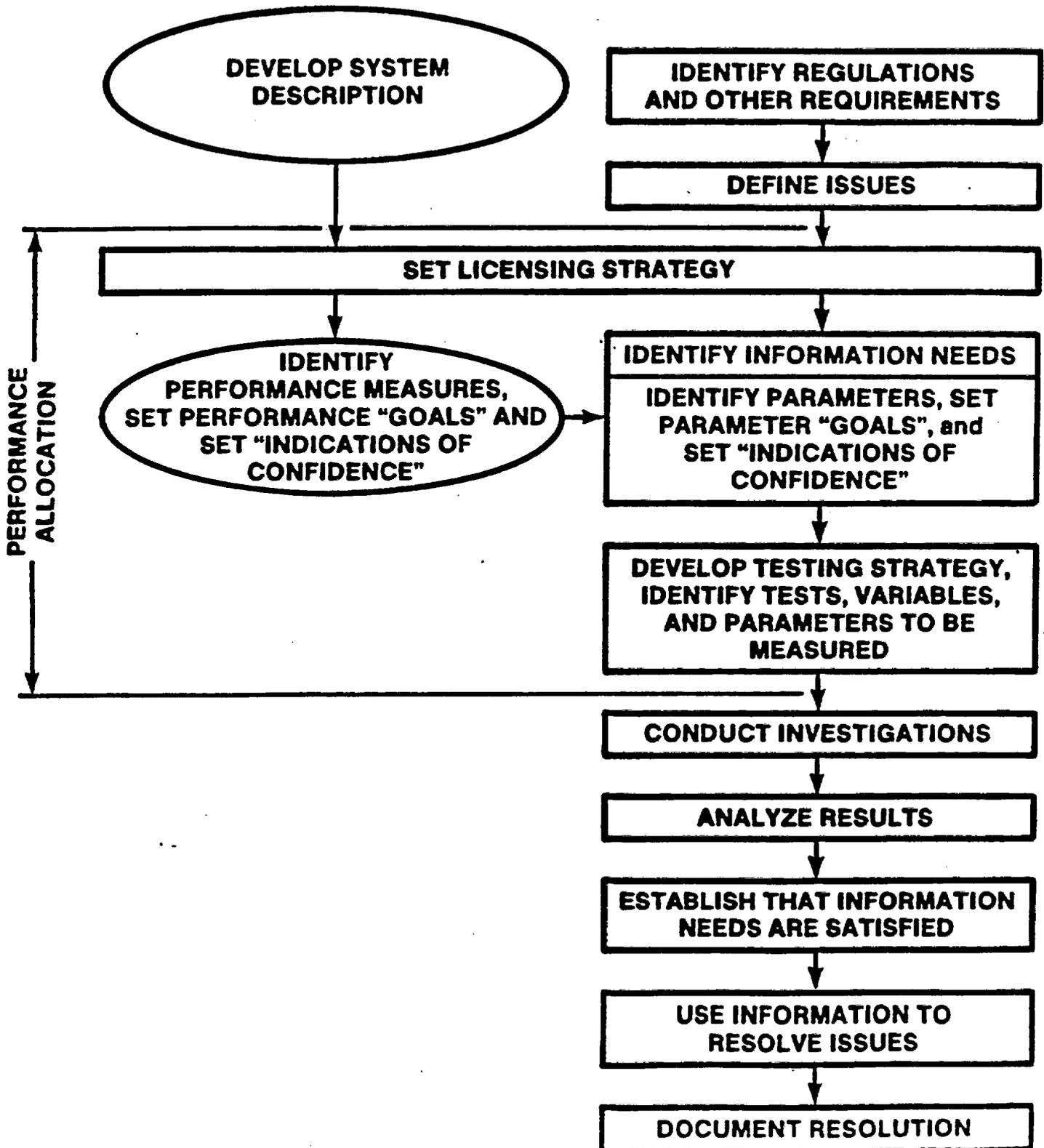
SCP PERFORMANCE ALLOCATION WORKSHOP SCHEDULE

<u>ISSUE(S)</u>	<u>DATE(S)</u>	<u>HOST</u>	<u>LEAD ORGANIZATION</u>
<u>HIGHER LEVEL FINDINGS AND SITE CRITERIA</u>			
1.17, 1.18, 2.8, 4.10	3/7 3/27-28 4/22-24	SAIC USGS USGS	SAIC/SNL
<u>GROUNDWATER TRAVEL TIME</u>			
1.15	3/11-12 3/26 (as necessary)	USGS USGS	SNL
<u>RELEASES TO ACCESSIBLE ENVIRONMENT AND EFFECTS OF REPOSITORY ON SITE CHARACTERISTICS</u>			
1.16, 1.12	3/13-14 4/2-3 4/17-18	SNL Los Alamos SNL	SNL
<u>REPOSITORY AND WASTE PACKAGE DESIGN</u>			
1.10, 1.11, 4.9, 4.5, 4.6, 4.7, 2.5, 2.6, 2.7	3/18-20 4/8-10	SNL SNL	SNL/LLNL
<u>WASTE PACKAGE AND EBS RELEASE</u>			
1.9, 1.13, 1.14	4/15	LLNL	LLNL

CONCERNS FROM PERFORMANCE ALLOCATION WORKSHOP

1. TITLES OF COLUMNS NOT ALWAYS APPROPRIATE
2. PERFORMANCE ALLOCATION APPROACH MAY NOT ASSURE THAT ALL INFORMATION FOR MAKING HIGHER LEVEL FINDINGS (10 CFR 960) AND COMPARATIVE EVALUATIONS TO SUPPORT REPOSITORY SELECTION IS AVAILABLE
3. PERFORMANCE ALLOCATION MAY CAUSE PREMATURE FOCUS ON TESTS/ANALYSES AT RISK OF OVERLOOKING PROCESSES YET TO BE RECOGNIZED
4. CHARACTERIZATION ISSUES
 - o DATA/PARAMETER NEEDS ARE "CALLED FOR" BY DESIGN/PERFORMANCE ISSUES
 - o MORE INFORMATION MAY BE NEEDED TO SUPPORT UNDERSTANDING OF SITE CONDITIONS (I.E. CREDIBILITY ARGUMENTS, SITE PERFORMANCE MODELS ETC.)
5. PROBLEM WITH "SHOOTING-OURSELVES-IN-THE-FOOD" BY ASSIGNING NUMERICAL VALUES TO PERFORMANCE GOALS AND CONFIDENCE LEVELS THAT WILL BE HARD TO "TAKE BACK".
6. DO WE SET GOALS FOR ACTUAL VALUES OR FOR THE CONFIDENCE THAT WE WILL REQUIRE IN THE VALUE, ONCE IT IS ESTABLISHED?
7. HOW CAN WE COMPLETE THIS EXERCISE WITH ALL OF THE OTHER CONFLICTING TASKS?

ISSUE RESOLUTION STRATEGY



POSSIBLE SOLUTIONS TO SOME OF THE TERMINOLOGY PROBLEMS

o EACH ISSUE RESOLUTION STRATEGY EXPLAINS HOW PERFORMANCE ALLOCATION IS USED WITHIN THAT ISSUE

o CONFUSION OVER TERMS

--PROCESSES OF CONCERN ARE IDENTIFIED AS PART OF STEP 3(IRS)

--PERFORMANCE MEASURES(STEP 4) ARE THEN ASSOCIATED WITH THE STEP 3 PROCESSES

--PARAMETERS ARE THEN "PROCESS PARAMETERS" THAT MAY OR MAY NOT BE DIRECTLY MEASUREABLE (STEP 6)

(THERE MAY BE OTHER TYPES OF PARAMETERS THAT MAKE MORE SENSE FOR OTHER ISSUES -- TEST PARAMETERS, SYSTEM/SUBSYSTEM PARAMETERS....)

--DEFINITION OF TESTS/ANALYSES THAT PROVIDE DATA FOR MEASUREABLE PARAMETERS IS STEP 7

WHERE DOES PERFORMANCE ALLOCATION FIT IN?

NNWSI PROJECT ISSUES HIERARCHY INFORMATION NEEDS

DATA/PARAMETER REQUIREMENTS
FOR SOME ISSUES GENERATED
"USING" INFORMATION NEEDS

PERFORMANCE ALLOCATION GENERATES
DATA/PARAMETER REQUIREMENTS
FOR DESIGN & PERFORMANCE ISSUES

PROJECT WORKSHOPS INTEGRATE & PRIORITIZE DATA/PARAMETER REQUIREMENTS

IMPROVED RATIONALE FOR TESTING
PROGRAM DUE TO INTEGRATION &
PRIORITIZATION OF DATA/PARAMETER
REQUIREMENTS

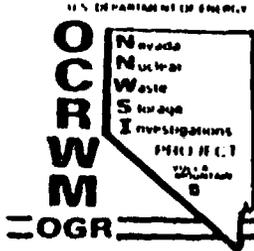
IMPROVED SET OF
INFORMATION NEEDS IN
ISSUES HIERARCHY

CONSISTENT APPROACH TO ISSUE
RESOLUTION FOR SCP CHAPT. 8

STATUS OF NNWSI PROJECT ISSUES HIERARCHY

- o LINE-IN/LINE-OUT VERSION SENT OUT IN EARLY FEBRUARY
- o ADDITIONAL SUGGESTED CHANGES HAVE BEEN RECEIVED
- o INFORMATION NEEDS WITHIN ISSUES MAY BE ADDED/SUBTRACTED DURING PERFORMANCE ALLOCATION AS ISSUE RESOLUTION STRATEGIES ARE DEVELOPED
- o BASELINE ISSUES HIERARCHY WITH FIXED INFORMATION NEEDS IS ESSENTIAL FOR EFFICIENT PREPARATION OF CHAPTER 8

QUESTION: CAN WE FINALIZE ISSUES HIERARCHY IN PARALLEL WITH PERFORMANCE ALLOCATION WORKSHOPS SO THAT IT IS STABLE FOR REMAINING CHAPTER 8 WRITING & REVIEW?



MEETING OBJECTIVES



*CDR = Conceptual Design Report
RDP = Repository Design Plan*

DAY 1

PRESENT REPOSITORY DESIGN FOR YUCCA MOUNTAIN.

PRESENT STATUS AND PLANS FOR EQUIPMENT DEVELOPMENT PROGRAM.

DAY 2

REVIEW THE ISSUES RESOLUTION APPROACH FOR DESIGN AND PRECLOSURE PERFORMANCE ASSESSMENT.

REVIEW APPROACH TO SPECIFIC ISSUES.

DEVELOP UNDERSTANDING OF HOW ISSUES RESOLUTION WILL BE INCORPORATED INTO SCP, SCP/CDR AND RDP.

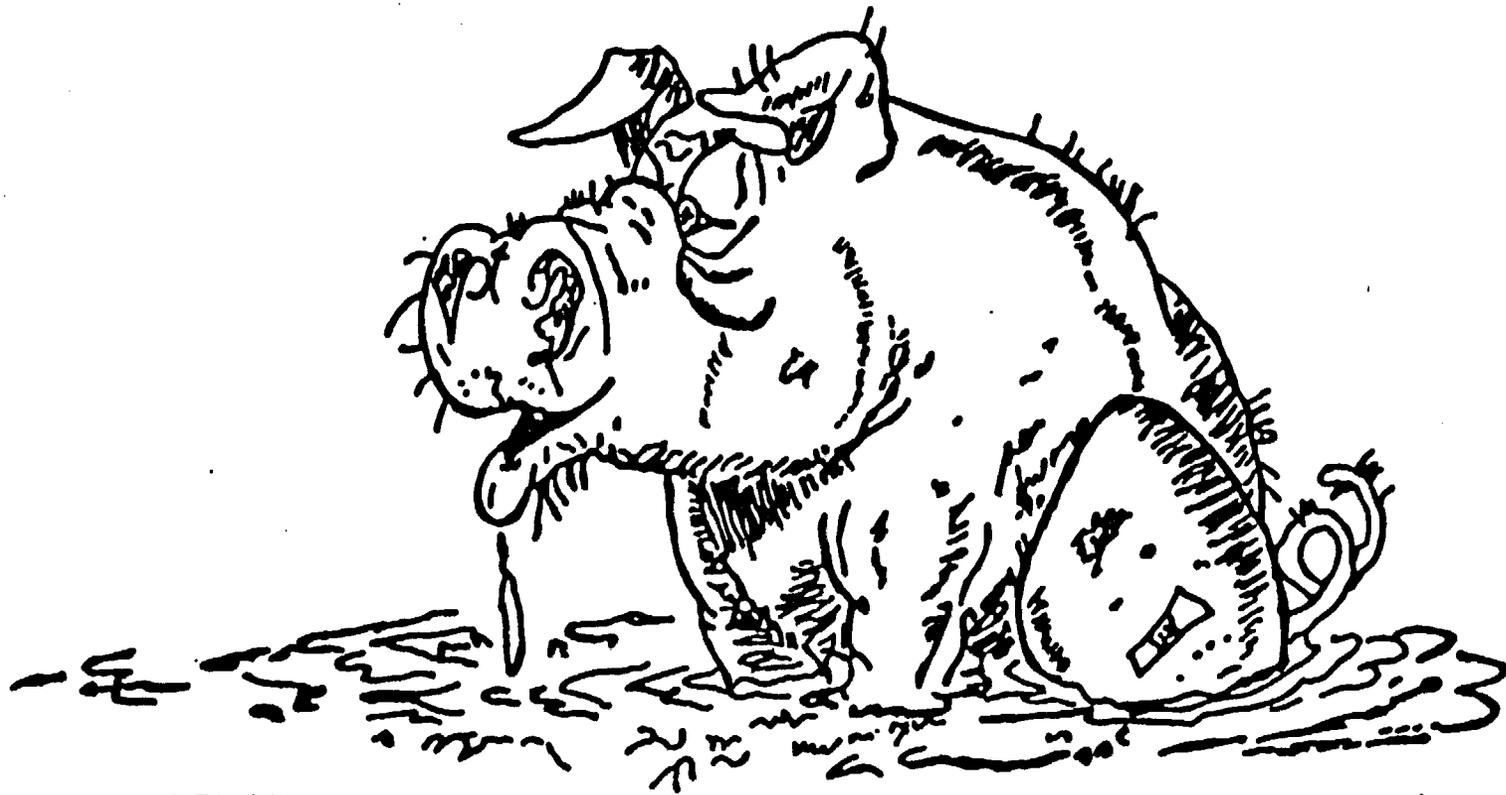
DAY 3

DEVELOP ANY MODIFICATIONS NECESSARY TO THE OUTLINE OF SCP, SCP/CDR, RDP.

GET FEEDBACK FROM HQ AND OTHER PROJECTS

REACH AGREEMENTS ON APPROACH AND DOCUMENT.

NEVER TRY TO TEACH A PIG TO SING,
IT WASTES YOUR TIME AND IT ANNOYS THE PIG



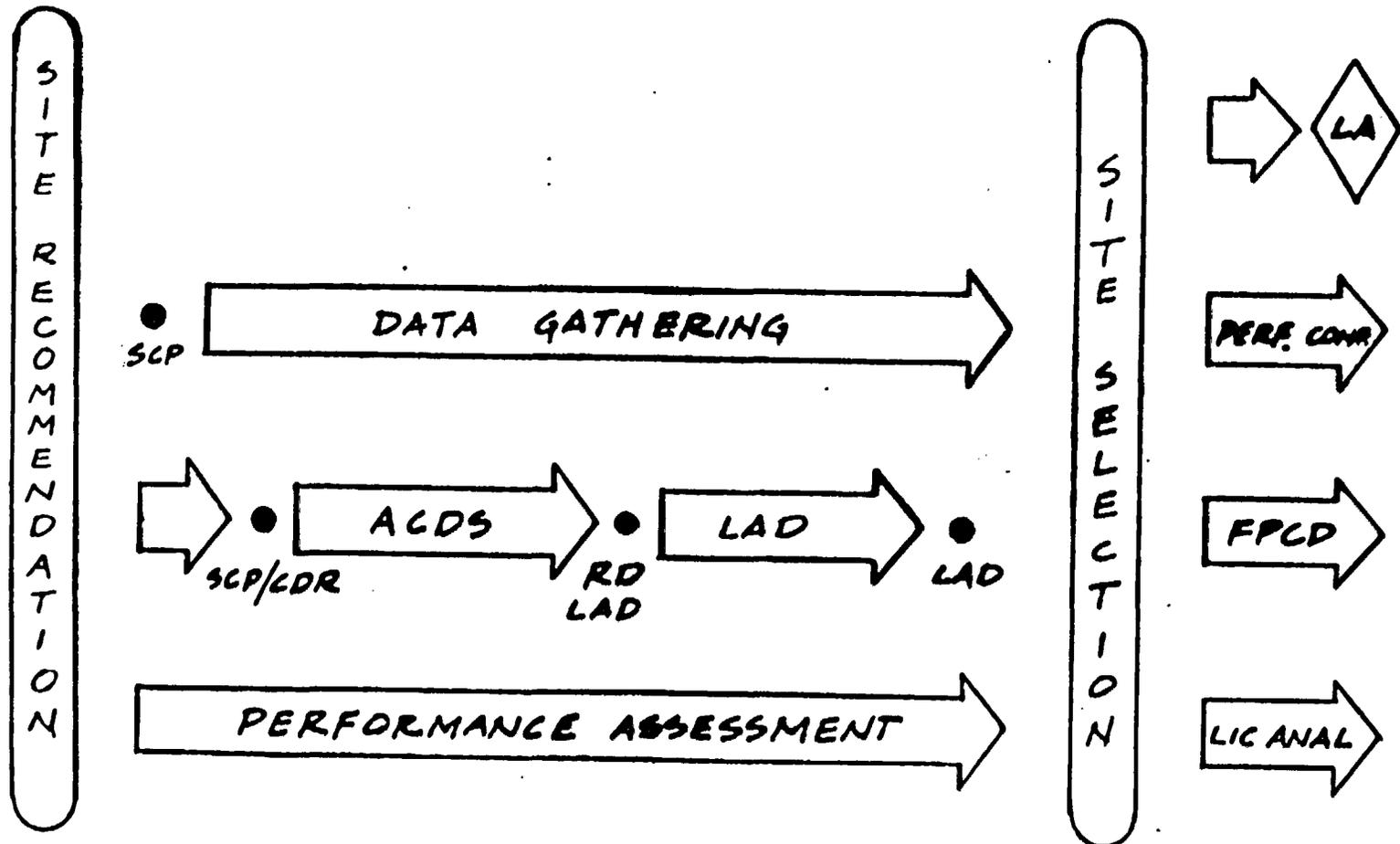


TO BE ACCOMPLISHED

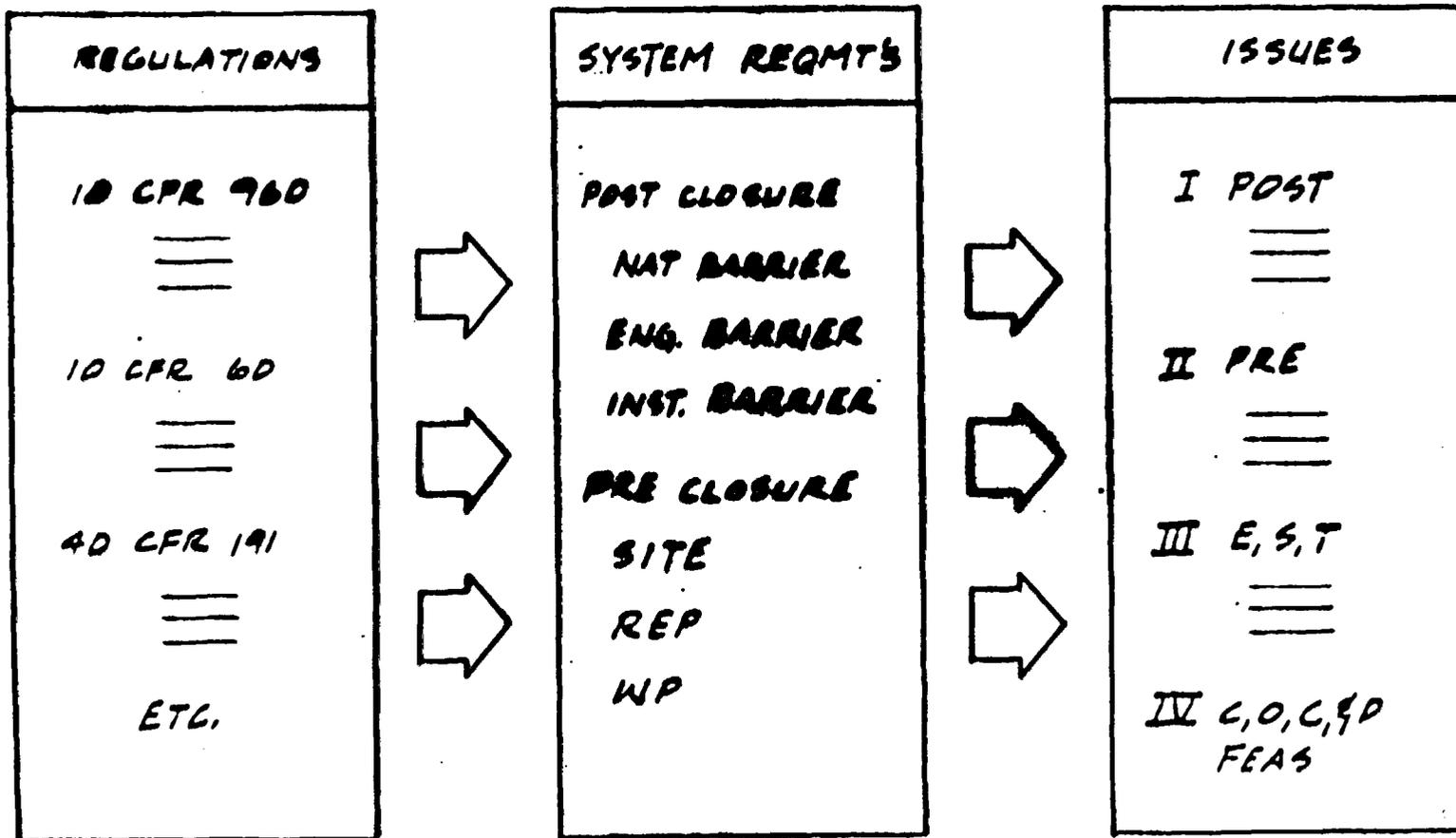


- 1. Present the issues approach to design and preclosure perf. assessment**
- 2. Present specific examples of resolution of design and PePA issues**
- 3. Develop the approach to incorporating IRS into the SCP, SCP/CDR, & RDP**
- 4. Agree on the content, level-of-detail, and revised outlines for SCP, SCP/CDR, and RDP**

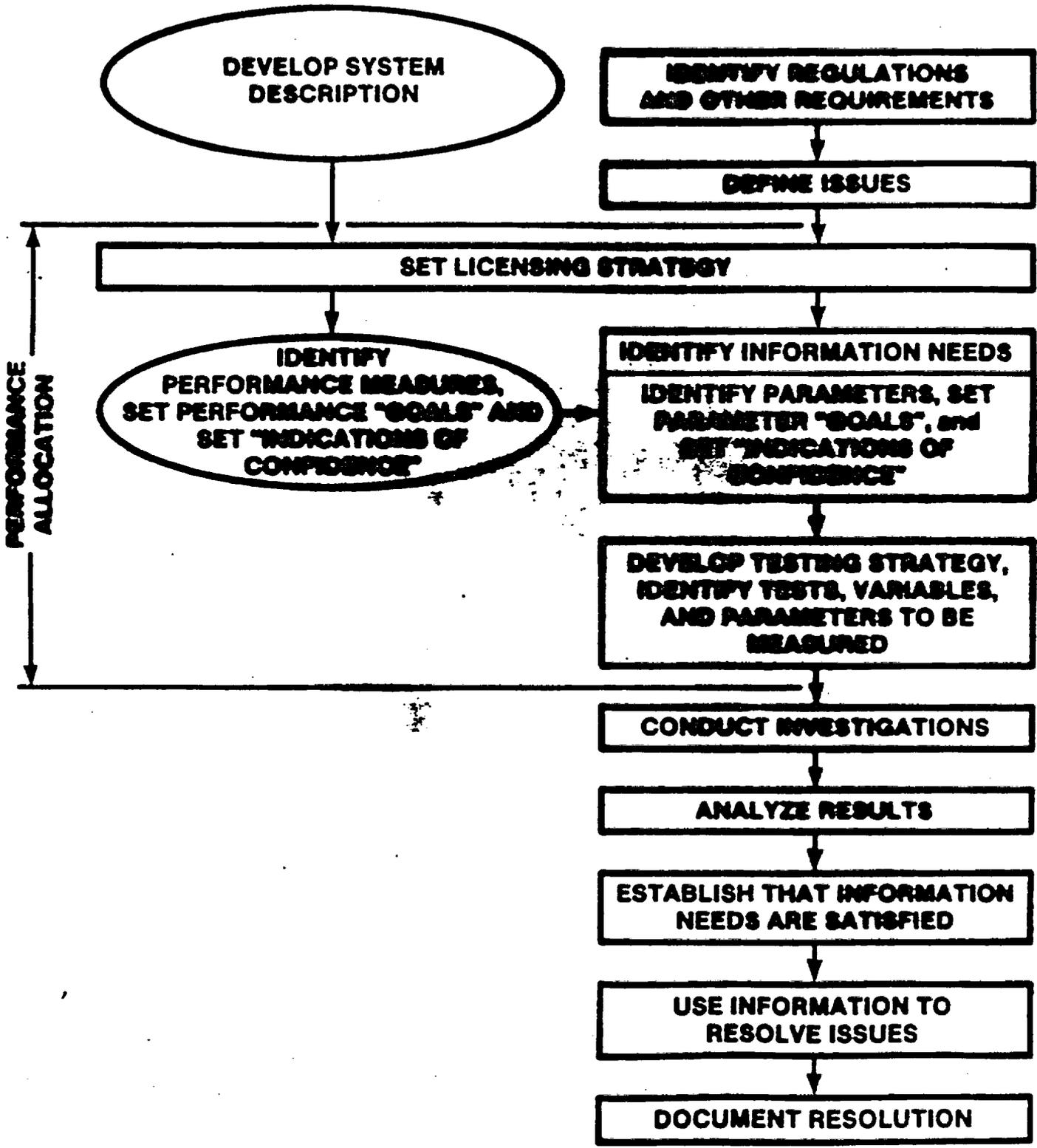
WHAT IS TO BE DONE



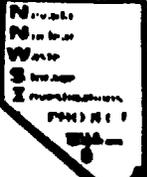
ORGANIZE THE WORK



ISSUE RESOLUTION STRATEGY



**O
C
R
W
M**



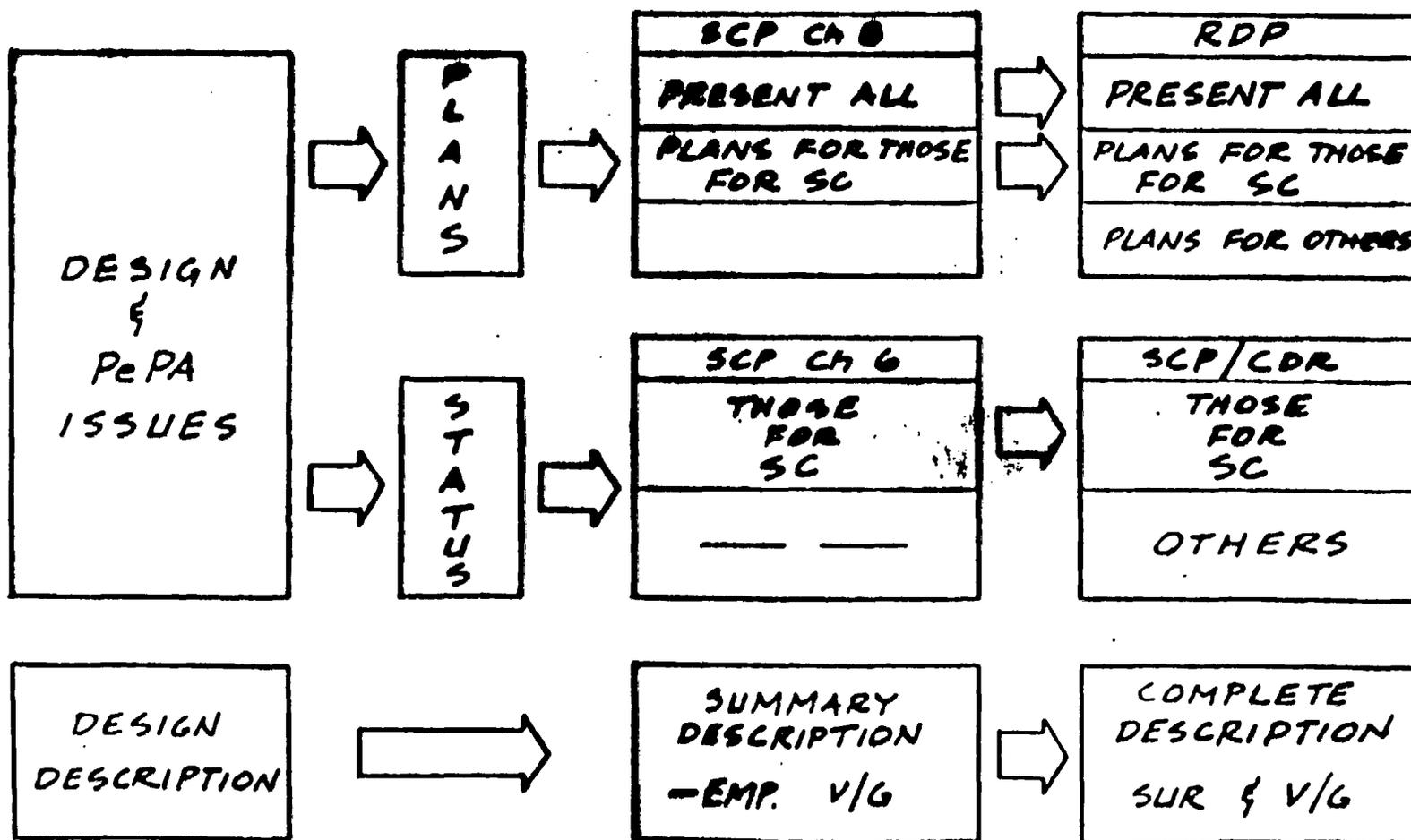
WHAT'S THE PROBLEM



ISSUES	SCP CHAP. 9	SCP DATA CHAPTERS	SCP-CDR	RDP
KEY ISSUE 1	8.0 INTRO 8.1 FROG NATIONAL 8.2 FROG 8.2.1 FROG FROG	CHAPT. 1 CHAPT. 2 CHAPT. 3 CHAPT. 4 CHAPT. 5	1.0 INTRO	INTRO
CHAR				ORG. & CONTROL
DESIGN				CONF. MGMT
PERF				QA
KEY ISSUE 2	8.2.2 REPOSITORY FROG	CHAPT. 6	2.0	DESC. OF ACTIV- ITIES (WBS)
CHAR				REPOSITORY WASTE PKG
DESIGN				
PERF	8.2.3 SEALS	6.1 DESIGN BASIS	7.2 DESIGN BASIS	2.0 DESIGN BASIS
KEY ISSUE 3				
CHAR				
DESIGN	8.3.4 WASTE PKG	6.2 REPOSITORY DES	7.3 DESIGN DESC	3.0 REPOSITORY OPS
PERF	8.3.5 PERF ASMT			4.0 DESIGN DES
				5.0 CLOSURE DECOM
KEY ISSUE 4				
CHAR		6.3 ASMT OF DSN ISS	7.4 R&D STATUS-WP DSN	6.0 PERF OBJS
DESIGN		6.4 SUM OF DSN ISS	7.5 SUMMARY	7.0 DESIGN ANAL
PERF				8.0 DESIGN ISSUES
				9.0 QUAL ASSUR
				DSN & PoPA ISSUES REPOSITORY WASTE PKG
				MANAGEMENT INFO STAFFING, CONTRACTS SCHEDULE COST

O
C
R
W
M
OGR

RELATIONSHIP OF DOCUMENTS TO ISSUES AND DESIGN DESCRIPTION



U.S. DEPARTMENT OF ENERGY

O
C
R
W
M

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT
MECCA MOUNTAIN

OGR

LICENSING UPDATE

TPO PRESENTATION
2/26/86

M. A. GLORA/D. M. DAWSON

**O
C
R
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

LICENSING UPDATE
TOPICS

-
- o STATUS OF NRC INTERACTIONS
 - MANAGEMENT MEETING
 - FUTURE TECHNICAL MEETINGS

 - o NRC/NNWSI PROJECT MEETING COMMITMENTS
 - POSITION
 - STATUS
 - RESPONSIBILITY

 - o STATUS OF RESOLUTION OF ANTICIPATED/UNANTICIPATED DEFINITION
 - PROBLEM
 - CONCERNS
 - RECOMMENDATIONS

**ORR
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

NNWSI PROJECT/NRC MANAGEMENT MEETING

2/19-20/86 - LAS VEGAS

-
- o OBJECTIVES OF MEETING
 - FAMILIARIZE EACH PARTY WITH CONCERNS AND PROBLEMS
 - DISCUSS FUTURE MEETING TOPICS & SCHEDULES
 - IMPROVE INFORMATION EXCHANGE APPROACH
 - REVIEW OPEN AND ACTION ITEMS FROM EARLIER MEETINGS
 - CORE LIBRARY LETTER FROM LINEHAN TO VIETH (11/18/85)
 - ALTERNATIVE DATA CONFIRMATION APPROACHES

 - o ASSESSMENT OF MEETING EFFECTIVENESS
 - NEED FOR THIS TYPE OF MEETING AT THE "SITE" REINFORCED
 - FAMILIARIZATION OBJECTIVE MET - BOTH BENEFITED

**OC
RW
M
OGR**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT
YUCCA MOUNTAIN

NNWSI PROJECT/NRC TECHNICAL MEETINGS

1986

- o DISCUSSED IN MANAGEMENT MEETING
- o COORDINATION PROBLEMS NOTED
 - SCP SCHEDULE IMPACT
 - RELATIONSHIP OF DOE/HQ GENERIC MEETINGS TO PROJECT MEETINGS

o MUTUAL AGREEMENT ON SITE SPECIFIC MEETING TOPICS

<u>SUBJECT</u>	<u>TENTATIVE TIMEFRAME</u>
ISSUES HIERARCHY	MAY*
PERFORMANCE ALLOCATION	JUNE*
SEISMIC/TECTONICS	JULY
ES DESIGN & CONSTRUCTION (#2)	SEPTEMBER
ES TESTING	OCTOBER
HYDROLOGY/GEOLOGY	TBD

* POTENTIALLY SUBJECT TO GENERIC MEETING REQUIREMENTS

**OC
RC
WM**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

NNWSI PROJECT/NRC TECHNICAL MEETINGS (CONT)

-
- o REQUIREMENTS FOR FINALIZING MEETING SCHEDULE
 - COORDINATE WITH DOE/HQ FOR GENERIC MEETINGS PLANS?
SCHEDULES?
 - EVALUATE
SCP REQUIREMENTS
BACKUP DOCUMENT AVAILABILITY
OPEN ITEM STATUS
 - DEVELOP MEETING DATES AND OBJECTIVES
EARLY NRC INVOLVEMENT
CONFIRM WITH DOE/HQ
FINALIZE WITH NRC

 - o CONDUCT "DRY RUNS" AS REQUIRED

 - o D. M. DAWSON IS LEAD SAIC LICENSING BRANCH CONTACT (575-0079)
 - CENTRALIZATION
 - DOE/HQ - WESTON
 - COMMITMENT/OPEN ITEM TRACKING

U.S. DEPARTMENT OF ENERGY

**OR
R
W
M**

NRC
 Nevada
 nuclear
 waste
 storage
 investigations
 PROJECT

**YUCCA
MOUNTAIN**

OGR

OTHER KEY POINTS FROM
MANAGEMENT MEETING

- o EXPANDED DISTRIBUTION OF NRC DOCUMENTS TO PROJECT

- o CONTINUING NRC-OR ACCESS
 - TENTATIVE NRC-OR APPENDIX 7 VISIT SCHEDULE
 - LLNL - APRIL
 - SNL - MAY
 - LOS ALAMOS - JUNE

- o "ALTERNATIVE" DATA CONFIRMATION METHODS

**OC
RW
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

NNWSI PROJECT/NRC MEETING COMMITMENTS

-
- o NNWSI PROJECT RESPONSE TO COMMITMENTS MADE DURING MEETINGS WITH NRC HAS NOT BEEN ACCEPTABLE.
 - DELAYS
 - TRACKING
 - COORDINATION

 - o NRC, IN GENERAL, HAS BEEN MORE RESPONSIVE THAN THE PROJECT
 - CREDIBILITY

 - o CLOSURE ON ISSUES ESSENTIAL TO SCP PREPARATION BEING DELAYED
 - EXPLORATORY SHAFT
 - SEISMIC/TECTONICS

**O
C
R
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT
VUCCA
MOUNTAIN

EXPLORATORY SHAFT DESIGN AND CONSTRUCTION

OGA

BACKGROUND/FY 86 ACTIVITIES

APRIL 1983	LETTER FROM NRC REQUESTING SPECIFIC INFORMATION ON ES CONSTRUCTION AND SEALING (INFORMATION REQUESTS) FOLLOWING THEIR REVIEW OF THE ES CONCEPTUAL DESIGN REPORT.
JUNE 1985	LETTER IN RESPONSE TO NRC INFORMATION REQUEST
JULY 1985	ES PERFORMANCE ANALYSIS STUDY
AUGUST 1985	MEETING WITH NRC TO PRESENT NNWSI PROJECT POSITION (OPEN ITEMS)
OCTOBER 1985	STATUS OF OPEN ITEMS
NOVEMBER 1985	LETTER FROM NRC DETAILING CONCERNS
DECEMBER 1985	PLANS FOR RESPONDING TO OPEN ITEMS (SNL/LOS ALAMOS)
JANUARY 1986	TPO MEETING DISCUSSION
FEBRUARY 1986	DISCUSSIONS WITH NRC'S STABLEIN
MARCH 1986	STATUS REPORT: OPEN ITEMS/INFORMATION REQUESTS
AUGUST 1986	PERFORMANCE ANALYSIS STUDY
SEPTEMBER 1986	ES DESIGN AND CONSTRUCTION POSITION MEETING WITH NRC

**O
C
O
R
R
I
O
N
S
I
N
V
E
S
T
I
G
A
T
I
O
N
S
P
R
O
J
E
C
T**

evado
uclear
aste
orage
investigations
PROJECT

YUCCA
MOUNTAIN

EXPLORATORY SHAFT DESIGN AND CONSTRUCTION

STATUS OF RESPONSES TO APRIL 1983 LETTER

o TOTAL INFORMATION REQUESTS: 19

o ACTIVITY

LEADS TO RESPONSES TO

REVISION OF PERFORMANCE ANALYSIS STUDY

10 REQUESTS

POSITION DEVELOPMENT

4 REQUESTS

DESIGN SPECS/ACCEPTANCE CRITERIA

LINER CONSTRUCTION/PLACEMENT/SEALING

TEST/INSPECTION PROCEDURES

QA PROCEDURES

MEETINGS

3 REQUESTS

ESTP

REPOSITORY DESIGN/SEAL DESIGN

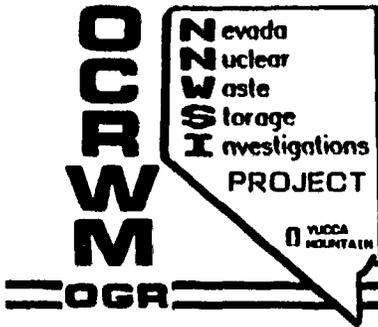
CLOSED

2 REQUESTS

LINE OF RESPONSIBILITY

DRILL HISTORY/TESTING G-4

U.S. DEPARTMENT OF ENERGY



EXPLORATORY SHAFT DESIGN AND CONSTRUCTION

STATUS OF RESPONSES TO OPEN ITEMS OF AUGUST 1985 MEETING

o TOTAL OPEN ITEMS: 20 NNWSI; 8 NRC

NRC

- 2 POSITION DEVELOPMENT ITEMS OPEN
 - GUIDANCE ON KEY PARAMETERS RE: ESF REPRESENTIVENESS
 - DRAINAGE AREA RUNOFF ANALYSIS

- 6 CLOSED
 - INFORMATION TRANSMITTAL ITEMS

**O
C
R
W
M
OGR**



EXPLORATORY SHAFT DESIGN AND CONSTRUCTION

STATUS OF RESPONSES TO OPEN ITEMS (CONT)

NNWSI

- 7 INFORMATION TRANSMITTAL ITEMS OPEN
 - 6 TO BE CLOSED IN MARCH; 1 IN JULY

- 5 POSITION DEVELOPMENT ITEMS OPEN
 - 2 REPRESENTATIVENESS
 - 1 LINER REMOVAL
 - 1 SHAFT DESIGN SPECS/ACCEPTANCE CRITERIA
 - 1 APPROACH FOR EVALUATING DAMAGE AROUND OPENINGS

- 8 DISCUSSION/MEETING ITEMS OPEN
 - 3 INFORMAL DISCUSSIONS
 - 4 ESTP
 - 1 REPOSITORY

NOTE THAT OPEN ITEMS CORRELATE WITH INFORMATION REQUEST TOPICS TO A CERTAIN DEGREE

**O
C
R
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

**YUCCA
MOUNTAIN**

PLANNED CORRECTIVE MEASURES

-
- o WMPO/SAIC LICENSING BRANCH TO ASSUME MORE ACTIVE ROLE INCLUDING:

- INCREASED LIAISON WITH NRC
 - INCREASED LIAISON WITH DOE/HQ (FOR GENERIC MEETINGS)
 - DEVELOPMENT, AND CRITICAL REVIEW OF FORMAL RESPONSE AVAILABILITY DATES - IN COORDINATION WITH WMPO AND TPO's
 - ACTIVE TRACKING AND DOCUMENTATION OF PROGRESS
 - REVIEW OF STATUS IN TPO MEETINGS
- o TO ASSIST IN MAINTAINING CENTRALIZED CONTROL THE FOLLOWING WILL BE IMPLEMENTED:
1. REACH AGREEMENT WITH NRC THAT ALL RESPONSES TO THEIR COMMITMENTS BE THROUGH DOE/WMPO WITH A COPY TO D. M. DAWSON (SAIC LICENSING BRANCH)
 2. ALL NNWSI PROJECT RESPONSES TO NRC WILL BE THROUGH WMPO WITH A COPY TO D. M. DAWSON

**O
C
R
W
M**

Nevada
Nuclear
Waste
Storage
Investigations
PROJECT

YUCCA
MOUNTAIN

DEFINITION OF ANTICIPATED AND UNANTICIPATED
PROCESSES AND EVENTS

STATEMENT OF THE PROBLEM

THE "ANTICIPATED/UNANTICIPATED CONCEPT" HAS WIDE RANGING APPLICABILITY ACROSS THE PROGRAM. HOWEVER, THERE IS NO EVIDENCE OF A COORDINATED EFFORT TO DEVELOP A CONSISTENT DEFINITION.

- SEISMIC/TECTONIC PAPER
- QUALITY ASSURANCE
- PERFORMANCE ALLOCATION/ISSUE PRIORITIZATION
- WESTON

CONCERNS

- o NO CONSISTENT POSITION FOR PROJECT USE
- o NUMEROUS ORGANIZATIONAL COMPONENTS DEVELOPING DEFINITIONS WITHOUT CONSULTATION
- o NO CONSISTENT POSITION FOR NRC TO EVALUATE

**O
C
R
W
M**

Nevada
Site
Investigations
PROJECT
YUCCA MOUNTAIN

DEFINITION OF ANTICIPATED AND UNANTICIPATED
PROCESSES & EVENTS (CONT)

CONCERNS (CONT)

- o LACK OF GUIDANCE FOR RESOURCE ALLOCATION
- o NO QUANTITATIVE DEFINITION OF WHICH PRE AND POST-CLOSURE EVENTS/SCENARIOS NEED TO BE EVALUATED
- o POSITION ESSENTIAL FOR PERFORMANCE ALLOCATION/ISSUE PRIORITIZATION

RECOMMENDATION

- o SENSITIZE DOE/HQ TO CONCERN
- o USE REGULATORY STRATEGY FROM S/T POSITION PAPER
- o DISCOURAGE ISOLATED ATTEMPTS TO RESOLVE PROBLEM
- o CENTRALIZE COMMUNICATIONS WITHIN PROJECT

1.

In C. Yang, Project Chief, UZ-Hydrochemistry,
Nuclear Hydrology Program,
U.S. Geological Survey

2.

A) Water Extraction

a. Triaxial Compression **\$34,000**

b. High-speed Centrifuge **\$55,500**

c. Vacuum Distillation **\$17,000**

B) Gas Sampling and Analyses **\$31,000**

C) Personnel **\$120,000**

Total \$257,000

3:

In Che Yang ----- Proj. Chief, UZ-Hydrochemistry

Ray Vaughns ----- Lab Tech. (Full Time)

Bob Emerson ----- Lab Tech. (Temp. Part Time 32hrs.)

Two Students ----- Lab Aids (Part Time, 20hrs.)

Hydrochemist. ----- M.S. degree.

Ed Weeks

USGS, National Research Project

Don Thorstenson

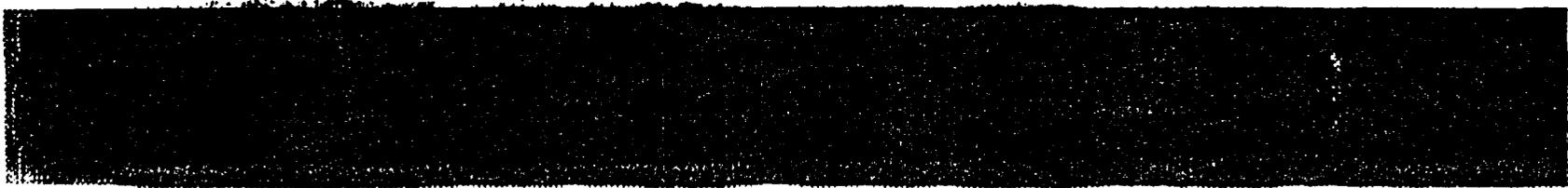
partly involved on CO₂ gas movement in UZ

Herbert Haas

Dave Kramer ----- Arizona State Univ. Prof. (gas tracer)?

Free to
DOE.

4)
5)



**DESCRIPTION OF THE UNSATURATED ZONE
HYDROLOGIC SYSTEM AT THE SITE**

Distribution and Properties of the
Unsaturated Zone Hydrogeologic Units
and Structural Features



Hydrologic and transport properties by
hydrochemical characterization of
UZ-boreholes and exploratory shaft

OBJECTIVES

To determine the flow paths, rate of movement of gas and water in the unsaturated zone, and extent of water-rock interactions

PARAMETERS

Water quality, flow paths(^{18}O ,D),
travel time(^3H , ^{14}C)

ACTIVITIES

Prototype pore-fluid extraction
tests (matrix and fracture)

Collection of perched water

Gas samplings and analyses of UZ-boreholes

Analyses of chemical and isotopic
compositions of pore-fluids

and perched water from cores of UZ-holes
and rubbles of exploratory shaft

7.

Jerry Kerrisk — LANL (Geochemistry)

Bill Glassley — LLNL (Geochemistry)-waste package

Ted Norris — LANL (Cl-36 dating)-geochem.

Joe Downey — USGS (Paleohydrology)

Parviz Montazer — USGS (Unsaturated Zone Hydrology)

Joe Rousseau — USGS (Deep Unsaturated Zone Hydrology)

Dale Hammimeister — USGS (Shallow Unsaturated Zone Hydrology)

Dwight Hoxie — USGS (System analysis)

Nancy Hayden — SNL (Performance assesment.)
— SNL (Data base).

8.

Since most of the studies involved are prototype,

the data may not be applicable until official

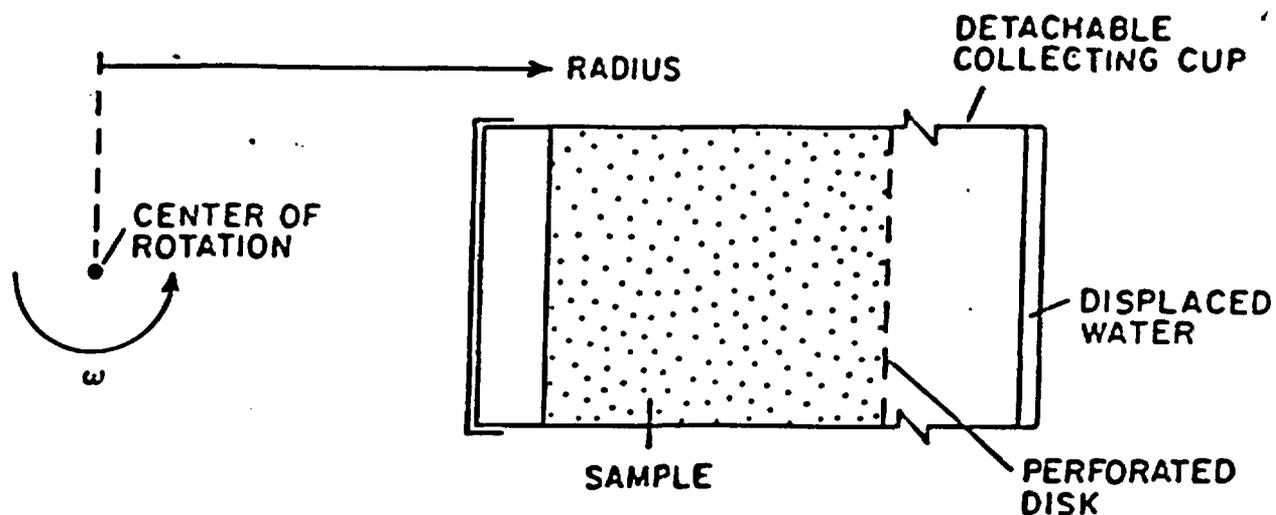
procedures are written-up. Therefore QA level = 3.

QA procedures will be written when procedures are finalized.

Gas sampling and analyses (HP-56, R1; HP-86)

High-Speed Centrifuge (HP-110)

DRAINAGE METHOD



IMMISCIBLE DISPLACEMENT

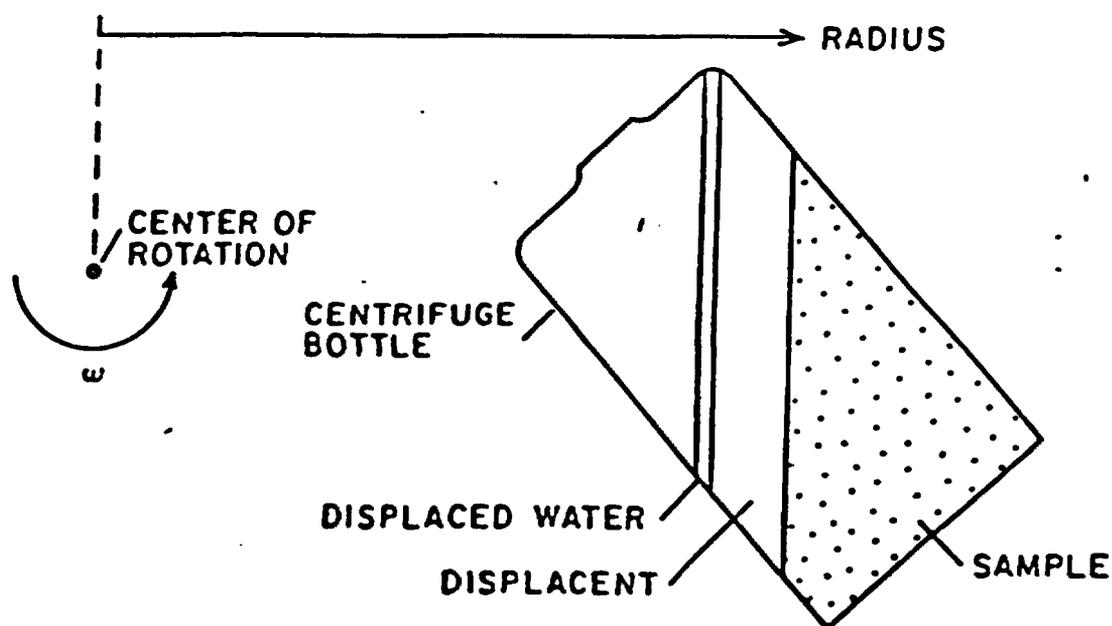


Fig. 1. Methods of Centrifugation.

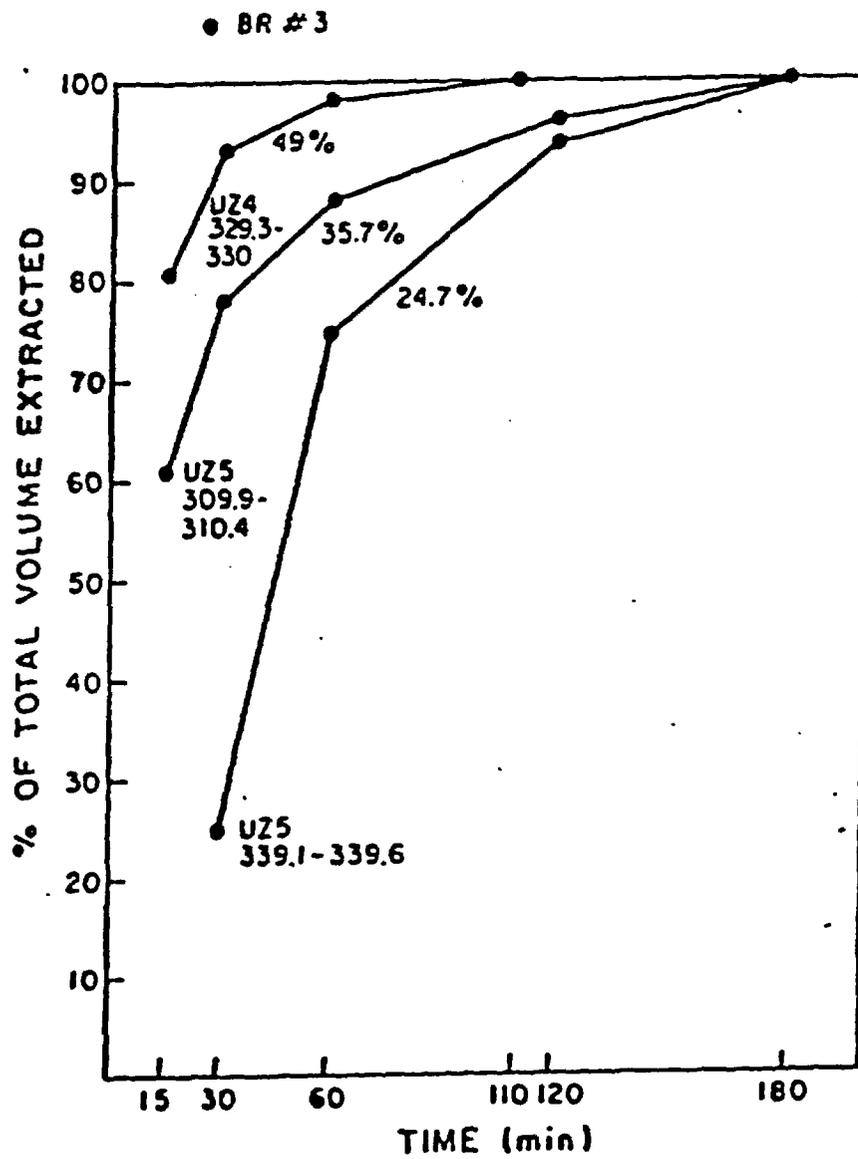
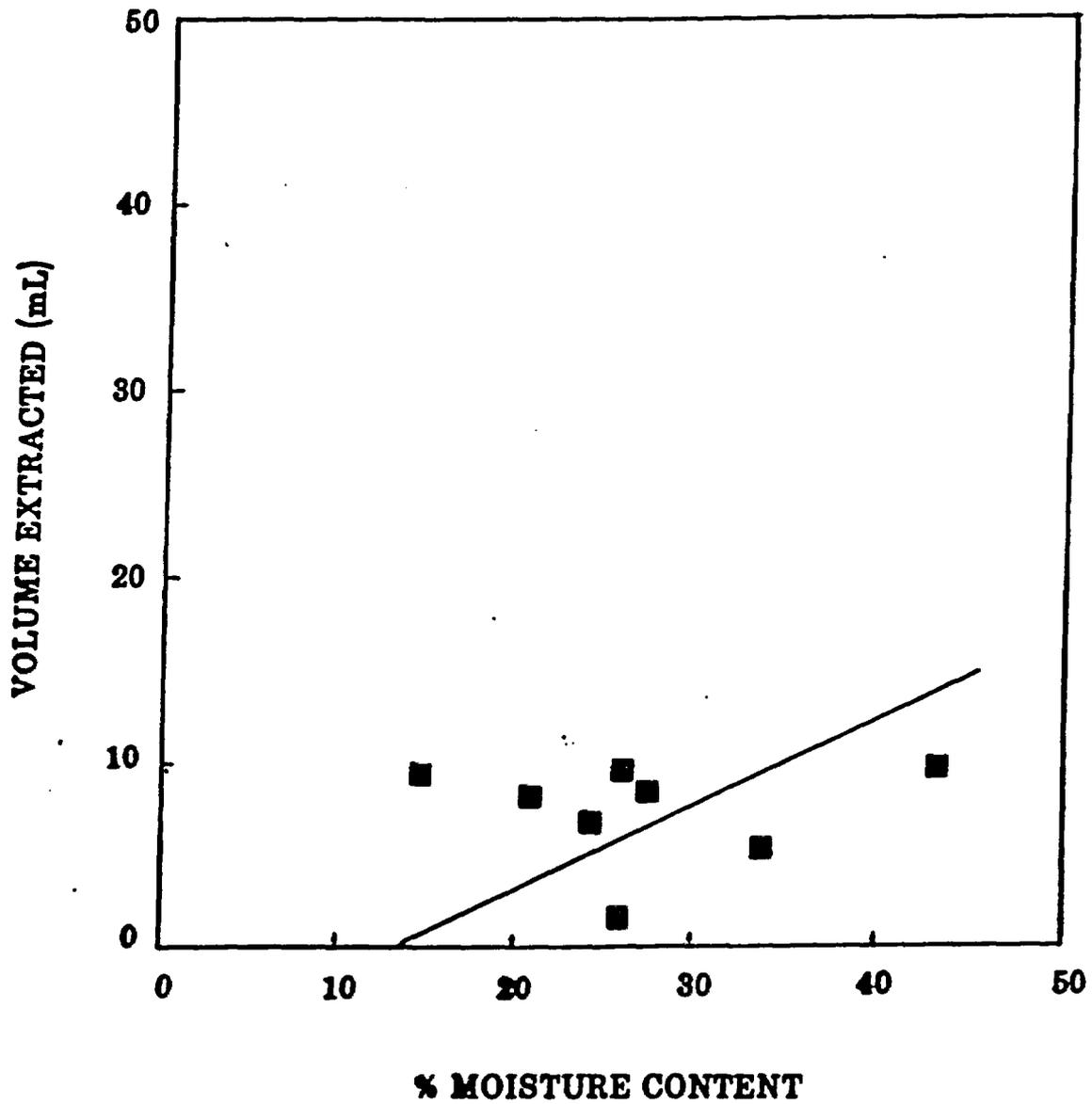
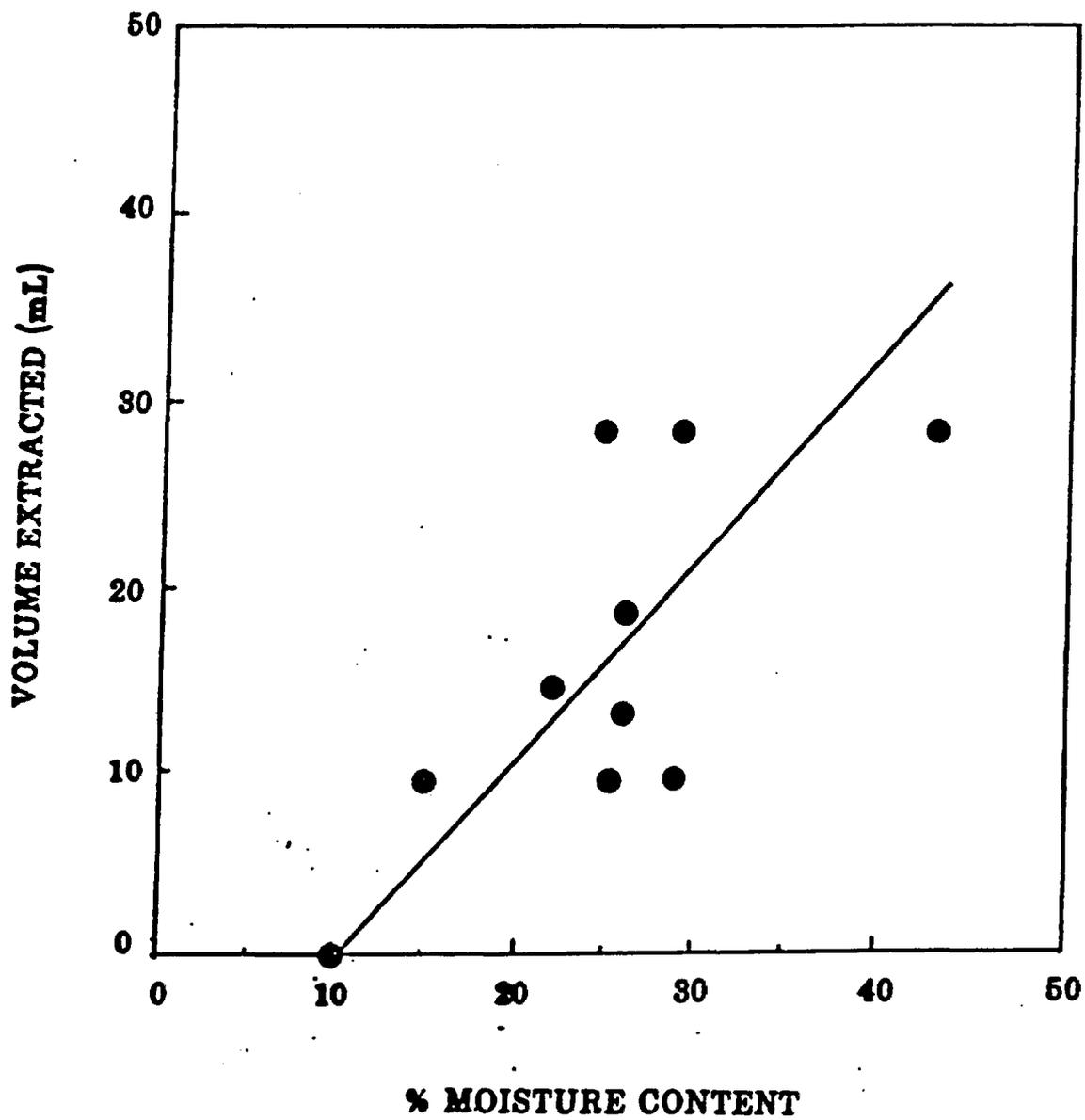


Fig. 2 Percent of Total Pore Water Extracted as a Function of Centrifugation Time.

Extracted water volumes from intact rock by drainage centrifugation



Extracted water volumes from crushed rock by drainage centrifugation



TIVA CANYON	NONE SPUN
BEDDED/REWORKED #1	⊙
YUCCA MOUNTAIN	□
BEDDED/REWORKED #2	NONE SPUN
PAH CANYON	△
BEDDED REWORKED #3	●
TOPOPAH SPRINGS	+

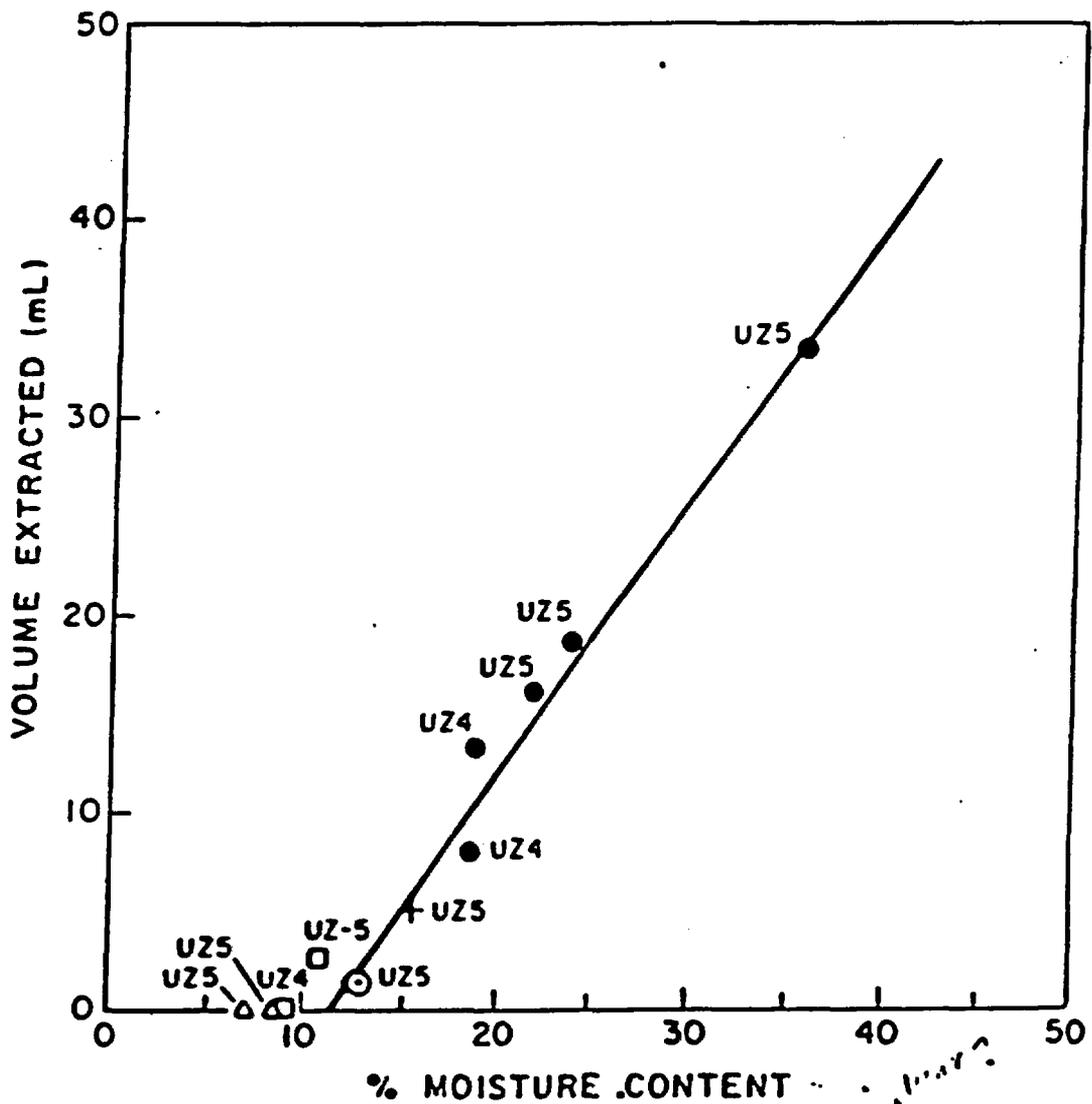


Fig. 3. Extracted Water Volumes from Crushed Rock by Immiscible Displacement Centrifugation. 4"-HQ Core from Wells UZ4 and UZ5. Centrifuge Speed 18000 RPM Spin-Time 120 min..



Department of Energy

Nevada Operations Office

P. O. Box 14100

Las Vegas, NV 89114-4100

FEB 21 1986

W. J. Purcell, Director, Office of Geologic Repositories, DOE/HQ (RW-20),
FORSTL

NEVADA NUCLEAR WASTE PROJECT OFFICE (NNWSI) PROJECT MONTHLY REPORT FOR
DECEMBER 1985

Enclosed is the NNWSI Project Monthly Report for December 1985 covering the
technical activities and status of the NNWSI Project.

A handwritten signature in cursive script, reading "Donald L. Vieth".

Donald L. Vieth, Director
Waste Management Project Office

WMPO:WRD-684

Enclosure:
NNWSI Project Monthly Report

FEB 21 1986

cc w/encl:

J. W. Bennett, DOE/HQ (RW-22), FORS
Ralph Stein, DOE/HQ (RW-23), FORS (2)
E. S. Burton, DOE/HQ (RW-25), FORS
J. J. Fiore, DOE/HQ (RW-22), FORS
V. J. Cassella, DOE/HQ (RW-22), FORS
J. O. Neff, NPO, DOE/RLC
S. A. Mann, DOE/CH
O. L. Olson, DOE/RL
Stan Goldsmith, ONWI, Columbus, OH
W. W. Dudley, Jr. USGS, Denver, CO
T. E. Goebel, F&S, Las Vegas, NV
Vincent Gong, REECo, Mercury, NV
T. O. Hunter, SNL, 6310, Albuquerque, NM
R. W. Lynch, SNL, 6300, Albuquerque, NM
D. T. Oakley, Los Alamos, NM
L. D. Ramspott, LLNL, Livermore, CA
M. E. Spaeth, SAIC, Las Vegas, NV
J. E. Tegtmeier, H&N, Mercury, NV
J. B. Wright, W, Mercury, NTS
T. R. Clark, MGR
R. W. Taft, AMES
J. R. Rinaldi, QAD
P. T. Prestholt, NRC 
R. R. Loux, NWPO, Carson City, NV
C. H. Johnson, NWPO, Carson City, NV
Dave Siefken, Weston, Rockville, MD
W. S. Twenhofel, SAIC, Lakewood, CO
Donald Schweitzer, BNL, Upton, NY
R. L. Wise, SAIC, Golden, CO
W. V. Macnabb, SAIC, Las Vegas, NV
J. R. LaRiviere, SAIC, Las Vegas, NV
J. H. Fiore, SAIC, Las Vegas, NV
L. W. Simmons, SAIC, Las Vegas, NV
R. J. Sweeney, SAIC, Las Vegas, NV
D. W. Sutton, SAIC, Las Vegas, NV
D. H. Irby, WMPO, DOE/NV
M. B. Blanchard, WMPO, DOE/NV
M. P. Kunich, WMPO, DOE/NV
James Blaylock, WMPO, DOE/NV
Wendy Dixon, WMPO, DOE/NV
J. R. Barner, WMPO, DOE/NV
L. P. Skousen, WMPO, DOE/NV