



Department of Energy
Washington, DC 20585

DEC 17 1992

Mr. Joseph J. Holonich, Director
Repository Licensing & Quality Assurance
Project Directorate
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Holonich:

The monthly status report for study plans is a spreadsheet produced by the Civilian Radioactive Waste Management and Operating Contractor (CRWMS M&O) that is used to report the dates that key events have taken place in the preparation, review, approval, revision, and comment response for Site Characterization Plan study plans.

In the past year, Yucca Mountain Site Characterization Project Office (YMPO) has received an increasing number of verbal, informal, and formal requests for schedules pertaining to the U.S. Department of Energy approval of study plans and their availability to the U.S. Nuclear Regulatory Commission (NRC). We believe that this status report will be of use to NRC by providing visibility into the movement of study plans through YMPO's approval system.

As part of the response to NRC's comments on Site Characterization Progress Report 5, YMPO has agreed to send this report to NRC. Enclosed is the monthly status report for study plans for October 1992.

If you have any questions, please contact Mr. Chris Einberg of my office at 202-586-8869.

Sincerely,

John P. Roberts
Acting Associate Director for
Systems and Compliance
Office of Civilian Radioactive
Waste Management

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Enclosure:
Status Report for Study
Plans, October 1992

cc: w\enclosure
C. Gertz, YMPO
R. Loux, State of Nevada
T. Hickey, Nevada Legislative Commission
M. Baughman, Lincoln County, NV
J. Bingham, Clark County, NV
B. Raper, Nye County, NV
P. Niedzielski-Eichner, Nye County, NV
G. Derby, Lander County, NV
P. Goicoechea, Eureka, NV
C. Schank, Churchill County, NV
F. Mariani, White Pine County, NV
V. Poe, Mineral County, NV
E. Wright, Lincoln County, NV
J. Pitts, Lincoln County, NV
R. Williams, Lander County, NV
J. Hayes, Esmeralda County, NV
B. Mettam, Inyo County, CA
C. Abrams, NRC

MONTHLY STUDY PLAN STATUS FOR OCTOBER 1992

1.0 INTRODUCTION

The following report summarizes the status of review and approval of Site Characterization Plan (SCP) study plans for the Yucca Mountain Project. Table 1 provides a summary status of all study plans that are currently planned or in review at the Yucca Mountain Site Characterization Project Office (Project Office), the Office of Civilian Radioactive Waste Management (OCRWM), and the U.S. Nuclear Regulatory Commission (NRC).

Section 2 of this report provides the major accomplishments in the process of developing study plans for the month of OCTOBER 1992. Section 3 summarizes the status of all study plans in the review process at the Project Office. Section 4 summarizes the status of study plan reviews that have been completed by the NRC and the State of Nevada.

2.0 STUDY PLAN HIGHLIGHTS FOR THE MONTH OF OCTOBER, 1992

2.1 NEW STUDY PLAN SUBMITTALS

Three new study plans, 8.3.1.8.1.2 Physical Processes of Magmatism and Effects on the Potential Repository, 8.3.1.8.5.2 Characterization of Igneous Intrusive Features and 8.3.1.15.2.2 Characterization of Site Ambient Thermal Conditions, were recieved by the Project Office in October. In addition, one Study Plan that has been in the system since 1989, 8.3.1.3.4.1/3 Batch Sorption Studies and the Development of Sorption Models, was completely rewritten and resubmitted to the Project Office. Because the Study Plan has been completely rewritten it will be put through the entire review process again.

2.2 REVIEW COMMENTS COMPLETED

No Project Office reviews were completed in October.

2.3 COMMENT RESOLUTION MEETINGS

No comment resolution meetings were held in October.

2.4 STUDY PLAN REVISIONS

No revisions of existing study plans were recieved by the Project Office in October.

2.5 COMMENT VERIFICATION

One Study Plan, 8.3.1.3.5.1/2 Dissolved Species Concentration Limits and Colloid Behavior, was returned to reviewers to verify the resolution of their comments and one Study Plan, 8.3.1.2.3.3 Saturated Zone Hydrologic System Synthesis and Modelling, completed verification of comment resolution in October.

2.6 STUDY PLANS APPROVALS

No study plans were approved by the Project Office in October.

2.7 COMPLETED NRC REVIEWS

No study plan phase I review were completed during October.

3.0 CURRENT STATUS OF ALL STUDY PLANS

3.1 PLANS IN REVIEW

The following study plans have not yet completed the screening and technical reviews by the Project Office.

| Identification/Organization | Date Draft Transmitted |
|--|-------------------------------|
| 8.3.1.3.4.1/8.3.1.3.4.3: Batch Sorption Studies/ Development of Sorption Models/LANL | 10/28/92 |
| 8.3.1.8.1.2: Physical Processes of Magmatism and Effects on the Potential Repository/LANL | 10/21/92 |
| 8.3.1.8.5.2: Characterization of Igneous Intrusive Features/USGS | 10/13/92 |
| 8.3.1.15.2.2: Characterization of Site Ambient Thermal Conditions/USGS | 10/13/92 |

3.2 STUDY PLANS AWAITING COMMENT RESOLUTION MEETINGS

Comments have been transmitted to the authors, and the Project Office is awaiting notification that the author is ready for a comment resolution meeting or notification that proposed resolutions have been agreed upon between the PI and reviewers without the need for a meeting.

| Identification/Organization | Date Comments Sent to PI |
|---|--------------------------|
| 8.3.4.2.4.1: Characterization of Chemical and Mineral Changes in the Postemplacement Environment/LLNL | 03/13/90 |
| 8.3.4.2.4.2: Hydrologic Properties of the Waste Package Environment/LLNL | 03/23/90 |

3.3 STUDY PLANS IN REVISION

3.3.1 Comment Resolution Meetings have been held, and the following study plans are being revised by the authors in response to comments.

| Title/Organization | Comment Resolution Meeting Date |
|--|---------------------------------|
| 8.3.1.3.3.2/8.3.1.3.3.3: Kinetics and Thermodynamics of Mineral Evolution/Conceptual Model of Mineral Evolution/LANL | 03/14/90 |
| 8.3.1.3.6.1: Dynamic Transport Column Experiments/LANL | 08/29/90 |
| 8.3.1.3.6.2: Diffusion/LANL | 08/30/90 |

3.3.2 No Comment Resolution meeting is required, and the following study plans are being revised by the authors in response to comments.

| Title/Organization | Comments Transmitted to PI |
|--|----------------------------|
| 8.3.1.2.2.2 R1: Water Movement Test/LANL | 5/12/92 |
| 8.3.1.3.1.1: Groundwater Chemistry Model/LANL | 5/6/92 |
| 8.3.1.5.1.6: Characterization of Future Regional and Environment | 01/30/92 |
| 8.3.1.12.2.1 R1: Meteorological Data Collection at the Yucca Mountain Site/SAIC | 6/17/92 |
| 8.3.1.15.1.4: Laboratory Determination of the Mechanicql Properties of Fractures/SNL | 5/12/92 |
| 8.3.1.15.1.8: In Situ Design Verification | 10/10/91 |
| 8.3.1.2.2.9: Site Unsaturated Zone Modeling and Synthesis/USGS | 02/27/92 |
| 8.3.1.17.3.3.2: Ground Motion from Regional Earthquakes and UNES/SNL | 02/27/92 |
| 8.3.1.17.4.4: Quaternary Faulting Proximal to the Site within NE Trending Fault Zones/USGS | 09/25/92 |

3.4 STUDY PLANS IN VERIFICATION AUDIT

The following study plans are being audited by reviewers to verify that comments have been satisfactorily responded to.

| Identification/Organization | Date Draft Transmitted |
|---|------------------------|
| 8.3.1.3.5.1/2: Dissolved Species Concentration Limits and Colloid Behavior/LANL | 10/21/92 |
| 8.3.1.17.3.5: Ground Motion at the Site from Controlling Seismic Events/USGS | 04/14/92 |

8.3.1.17.4.3: Quaternary Faulting within 100 km of Yucca Mountain, including the Walker Lane/USGS 09/22/92

8.3.4.2.4.3: Mechanical Properties of the Waste Package Environment/LLNL 10/08/91

3.5 BEING PREPARED FOR PROJECT OFFICE APPROVAL

8.3.1.2.3.3: Site Saturated Zone Hydrologic Synthesis and Modeling/USGS 10/19/92

8.3.1.3.4.2: Biological Sorption and Transport/LANL 12/07/91

8.3.1.4.3.1: Systematic Acquisition of Site-Specific Subsurface Information/SNL 09/04/92

8.3.1.5.2.1.1: Characterization of Quaternary Regional Hydrology/USGS 08/10/92

8.3.1.5.2.2: Characterization of Future Regional Hydrology due to Climate Change 07/14/92

8.3.1.8.2.1: Analysis of Waste Package Rupture due to Tectonic Processes and Events/SAIC 08/11/91

8.3.1.9.2.1: Natural Resource Assessment of Yucca Mountain, Nye County/USGS 09/28/92

3.6 APPROVED STUDY PLANS

None

4.0 STUDY PLANS IN REVIEW AT NRC AND THE STATE OF NEVADA

4.1 NRC ACCEPTANCE REVIEW

The following study plans are in Phase 1 review at the NRC.

| Identification/Organization | Transmittal Date |
|--|------------------|
| 8.3.1.2.2.1 R1: Characterization of Unsaturated Zone Infiltration/USGS | 06/1/92 |
| 8.3.1.2.2.2: Water Movement Tracer Tests/LANL | 02/09/89 |
| 8.3.1.2.2.4(.4, .5, .7, .8, .9): Characterization of the Yucca Mountain Unsaturated Zone Percolation-- Exploratory Shaft Facility Study/USGS | 02/09/89 |
| 8.3.1.2.2.5: Diffusion Tests in the ESF/LANL | 6/8/92 |
| 8.3.1.2.2.8: Fluid Flow in Unsaturated, Fractured Rock | 9/01/92 |
| 8.3.1.2.3.2: Characterization of the Saturated Zone Hydrochemistry | 6/5/92 |
| 8.3.1.3.7.1: Retardation Sensitivity Analysis/LANL | 9/01/92 |
| 8.3.1.4.2.1: Characterization of Vertical and Lateral Distribution of Stratigraphic Units in the Site Area/USGS | 6/22/92 |
| 8.3.1.4.2.2(except .3 & .5): Characterization of Structural Features within the Site Area/USGS | 02/09/89 |
| 8.3.1.4.2.2(3. & .5): Characterization of Structural Features within the Site Area/USGS | 06/15/92 |
| 8.3.1.15.1.1: Laboratory Thermal Properties | 01/25/91 |
| 8.3.1.15.1.2: Laboratory Thermal Expansion Testing/SNL | 10/04/90 |
| 8.3.1.15.1.3: Laboratory Determination of the Mechanical Properties of Intact rock | 06/21/91 |

- 8.3.1.15.1.5: Excavation Investigations/SNL 02/09/89
- 8.3.1.15.2.1.2: Characterization of Site Ambient Stress Conditions/USGS 02/09/89
- 8.3.1.17.4.5: Detachment Faults at or Proximal to Yucca Mountain/USGS 08/12/92

4.2 STUDY PLANS ACCEPTED BY THE NRC

The following study plans have been accepted by the NRC.

| Identification/Organization | Acceptance Date |
|--|-----------------|
| 8.3.1.2.1.1: Characterization of the Meteorology for Regional Hydrology and Meteorological Monitoring/USGS | 10/21/91 |
| 8.3.1.2.1.2: Characterization of Run-off and Streamflow/USGS | 08/14/92 |
| 8.3.1.2.1.3: Characterization of the Regional Ground-Water Flow System/USGS | 10/4/91 |
| 8.3.1.2.1.4: Regional Hydrologic Synthesis and Modeling | 5/6/92 |
| 8.3.1.2.2.1: Characterization of Unsaturated Zone Infiltration/USGS | 5/31/91 |
| 8.3.1.2.2.3: Characterization of Percolation in the Unsaturated Zone--Surface Based Study/USGS | 3/26/92 |
| 8.3.1.2.2.6: Characterization of Gaseous-Phase Movement in the Unsaturated Zone | 10/07/91 |
| 8.3.1.2.2.7: Hydrochemical Characterization of the Unsaturated Zone/USGS | 05/01/92 |
| 8.3.1.2.3.1.1-6: Characterization of the Site Saturated Ground-Water Flow System | 12/06/91 |

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|---|----------|
| 8.3.1.2.3.1.7: Testing of the C-Hole Site with Reactive Tracers | 12/06/91 |
| 8.3.1.3.2.1: Mineralogy, Petrology, and Chemistry of Transport Pathways/LANL | 03/13/91 |
| 8.3.1.3.2.2: History of Mineralogic and Geochemical Alteration of Yucca Mountain | 04/27/92 |
| 8.3.1.5.1.2: Paleoclimate Study: Lake, Playa, and Marsh Deposits | 04/27/92 |
| 8.3.1.5.1.3: Climatic Implications of Terrestrial Paleocology/USGS | 09/03/92 |
| 8.3.1.5.1.4: Analysis of the Paleoenvironmental History of the Yucca Mountain Site | 12/06/91 |
| 8.3.1.5.2.1: Characterization of the Quaternary Regional Hydrology/USGS | 06/08/90 |
| 8.3.1.8.1.1: Probability of Magmatic Disruption of the Repository/LANL | 10/5/91 |
| 8.3.1.8.5.1: Characterization of Volcanic Features/LANL | 08/20/90 |
| 8.3.1.9.2.2: Water Resource Assessment for Yucca Mountain/SAIC | 5/4/92 |
| 8.3.1.12.2.1: Meteorological Data Collection at the Yucca Mountain Site | 11/12/91 |
| 8.3.1.14.2: Studies to Provide Soil and Rock Properties of Potential Locations of Surface and Subsurface Facilities | 01/24/92 |
| 8.3.1.16.1.1: Characterization of Flood Potential of the Yucca Mountain Site/USGS | 05/08/91 |
| 8.3.1.17.3.1: Relevant Earthquake Sources | 5/18/92 |
| 8.3.1.17.3.4: Effects of Local Site Geology on Surface and Subsurface Ground Motions/USGS | 6/8/92 |

| | |
|--|-----------------|
| 8.3.1.17.4.1: Historical and Current Seismicity/USGS | 05/14/91 |
| 8.3.1.17.4.2: Evaluating the Location and Recency of Faulting Near Prospective Surface Facilities/SNL | 03/16/90 |
| 8.3.1.17.4.6: Quaternary Faulting Within the Site Area/USGS | 10/3/91 |
| 8.3.1.17.4.10: Geodetic Leveling/USGS | 10/4/91 |

4.3 COMMENTS ON APPROVED STUDY PLANS

The following approved study plans have been the subject of written comments by the NRC and the State of Nevada. The status of the responses to these comments is given below.

| Study Plan | Source & No. of Comments | | Status |
|--|-----------------------------|----|------------------------|
| 8.3.1.2.1.1: Characterization of the Meteorology for Regional Hydrology and Meteorological Monitoring | NV | 10 | Response sent 7/13/92 |
| 8.3.1.2.1.2: Regional Surface Water Run-Off and Streamflow | NV | 7 | Response sent 8/20/91 |
| 8.3.1.2.1.4: Regional Hydrologic Synthesis and Modeling | NRC | 1 | Response sent 7/10/92 |
| 8.3.1.2.2.6: Characterization of Gas Phase Movement in the Unsaturated Zone | NRC | 1 | Response sent 7/23/92 |
| 8.3.1.2.3.1.1-6: Characterization of the Site Saturated Zone Ground Water Flow System | NV | 16 | Response sent 7/27/92 |
| 8.3.1.2.3.1.7: Testing of the C-Hole Site with Reactive Tracers | NRC | 2 | In preparation |
| 8.3.1.3.2.1: Mineralogy, Petrology and Chemistry Along Transport Pathways | NRC | 2 | Response sent 9/14/92 |
| 8.3.1.5.1.4: Analysis of the Paleoenvironmental History of the Yucca Mountain Site | NRC | 6 | Response sent 10/29/91 |
| 8.3.1.5.1.4: Analysis of the Paleoenvironmental History of the Yucca Mountain Site | NRC | 1 | Response sent 9/16/92 |
| 8.3.1.5.2.1: Quaternary Regional Hydrology | NRC | 9 | Response sent 12/19/90 |
| | NV | 10 | Response sent 9/19/91 |

| Study Plan | Source & No. of Comments | Status |
|--|-----------------------------|--|
| 8.3.1.8.1.1: Probability of Volcanic Eruption Penetrating the Repository | NV 24 NRC 13 | Response sent 7/19/92 In preparation |
| 8.3.1.8.5.1: Characterization of Volcanic Features | NV 5 NRC 3 | Response sent 8/23/91 Response sent 7/24/91 |
| 8.3.1.9.2.2: Water Resource Assessment of Yucca Mountain | NRC 1 | Response sent 6/29/92 |
| 8.3.1.12.2.1: Meteorological Data Collection at the Yucca Mountain Site | NV 5 | In preparation |
| 8.3.1.14.2: Studies to Provide Soil and Rock Properties for Potential Locations of Surface Facilities | NRC 1 NV 10 | Response sent 8/07/92 Response sent 8/21/92 |
| 8.3.1.16.1.1: Characterization of Flood Potential | NV 9 NRC 1 | Response sent 6/6/91 Telecon resolution 8/15/92 |
| 8.3.1.17.3.1: Relevant Earthquake Sources | NRC 1 | In preparation |
| 8.3.1.17.3.4: Effect of Local Site Geology on Surface and Subsurface Motion | NRC 1 | In preparation |
| 8.3.1.17.4.1: Historic and Current Seismicity | NRC 3 | Telecon resolution 8/15/92 |
| 8.3.1.17.4.2: Location and Recency of Faulting Near Prospective Surface Facilities | NRC 16 NV 3 | Response sent 12/19/90 Response sent 10/15/90 |
| 8.3.1.17.4.6: Quaternary Faulting | NRC 1 | Response sent 12/16/91 |

LEGEND FOR TABLE 1

| | |
|---------------------------|---|
| Submit to YMP | Gives the actual date of the submission of the draft study plan. |
| Screening Review Complete | Date that screening review was received by the Project Office. Screening reviews were not done for some study plans submitted early in the process. These are indicated by the word "None". Revs. 2 & 3 of AP-1.10Q did not require a screening review. Plans reviewed under Rev. 2 & 3 are indicated by "NA". |
| Comments to PI | Date that review comments were transmitted to the Principal Investigator for review. |
| Comment Resol. Meeting | Date that comment resolution meeting to agree on proposed comment resolutions was completed. An "N/A" indicated that a comment resolution meeting was not required. |
| PI Revision Complete | Date that revised study plan that responds to Project Office and Headquarters comments is submitted to the Project Office. |
| Verify Comm. Res. | Date that the verification of actual dispositions of comments is completed by reviewers. |
| PO Approve | Date that Project Office approves the plan. |
| Submit To NRC | The date that the study plan is submitted to the NRC for review. |
| NRC Phase 1 Review | Date that NRC Acceptance and Start-Work Reviews are completed. |
| NRC Phase 2 Review | Date that NRC Detailed Technical Reviews are completed or note that none will be completed or the review will be deferred. |

Study Plan Tracking Sheet

| # | SP NAMES/CODE | SP NUMBER | SUBMIT TO YMP | SCREENING REVIEW COMPLETE | COMMENTS TO PI | COMMENT RESOL MEETING | PI REVISION COMPLETE | VERIFY COMMENT RESOL | PO APPROVE | SUBMIT TO NRC | NRC PHASE I REVIEW | NRC PHASE II REVIEW |
|-------|--|---------------|---------------|---------------------------|----------------|-----------------------|----------------------|----------------------|------------|---------------|--------------------|---------------------|
| 1 | CHAR OF MET FOR REG HYDRO AND MET MONITOR/USGS | 8.3.1.2.1.1 | 6/26/90 | 6/27/90 | 10/1/90 | 11/9/90 | 11/9/90 | 2/25/91 | 3/13/91 | 6/21/91 | 10/21/91 | NONE |
| 2 | CHAR RUNOFF AND STREAMFLOW/USGS | 8.3.1.2.1.2 | 3/27/89 | NA | 10/17/89 | 2/28/90 | 3/22/90 | 7/17/90 | 8/21/90 | 10/4/90 | 5/14/91 | 8/14/92 |
| 3 | CHAR OF REG GRD W FLOW SYSTEM/USGS | 8.3.1.2.1.3 | 3/1/90 | 3/14/90 | 7/3/90 | 8/23/90 | 9/17/90 | 10/19/90 | 1/18/91 | 2/15/91 | 10/4/91 | NONE |
| 4 | REG HYDRO SYS SYN AND MODELING/USGS | 8.3.1.2.1.4 | 6/6/90 | 6/29/90 | 3/14/91 | NA | 5/8/91 | 10/2/91 | 12/18/91 | 1/15/92 | 5/6/92 | |
| 5 | CHAR UNSAT ZONE INFILTRATION/USGS | 8.3.1.2.2.1 | 3/9/90 | 3/14/90 | 7/3/90 | 9/12/90 | 9/17/90 | 10/15/90 | 1/18/91 | 3/1/91 | 5/31/91 | NONE |
| 6 | WATER MOVEMENT TEST/LANL, REV O | 8.3.1.2.2.2 | 9/23/87 | N/A | COMPLETE | 10/23/87 | 10/30/87 | 1/9/89 | 11/9/89 | 2/9/89 | DEFERRED | |
| 6 R1 | WATER MOVEMENT TEST/LANL, REV I | 8.3.1.2.2.2 | 10/17/91 | NA | 5/12/92 | | | | | | | |
| 7 | CHAR PERCOL IN UZ-SURFACE BASED STUDY/USGS | 8.3.1.2.2.3 | 8/12/88 | NA | 1/23/89 | 1/30-31/89 | 2/20/90 | 1/9/91 | 04/08/91 | 5/10/91 | 3/26/92 | |
| 8 | CHAR YUC MTN PERCO UNSAT ZONE-ESF INVEST/USGS | 8.3.1.2.2.4 | | | | | | | | | | |
| | (.4,.5,.7,.8,.9) | | 9/9/87 | NA | 12/7/88 | 10/19/87 | 1/4/89 | 1/9/89 | 1/09/89 | 2/9/91 | DEFERRED | |
| 8 R1 | CHAR YUC MTN PERCO UNSAT ZONE-ESF INVEST/USGS | 8.3.1.2.2.4 | | | | | | | | | | |
| | (.1,.2,.3,.6,.10) | | | | | | | | | | | |
| 9 | DIFFUSION TESTS IN ESF/LANL | 8.3.1.2.2.5 | 11/1/88 | 11/18/88 | 2/28/90 | 8/28/90 | 6/11/91 | 1/24/92 | 4/22/92 | 6/8/92 | | |
| 10 | CHAR GAS-PHASE MOVEMENT IN UZ/USGS | 8.3.1.2.2.6 | 6/12/89 | 7/14/89 | 3/9/90 | 5/24/90 | 5/24/90 | 04/03/91 | 6/11/91 | 6/24/91 | 10/07/91 | NONE |
| 11 | HYDROCHEM CHAR OF UZ/USGS | 8.3.1.2.2.7 | 10/24/88 | 11/4/88 | 3/8/89 | 3/29-31/89 | 6/27/89 | 4/10/90 | 9/18/90 | 5/8/91 | 5/1/92 | DEFERRED |
| 12 | FLUID FLOW IN UNSAT, FRAC ROCK/USGS | 8.3.1.2.2.8 | 9/7/90 | 10/3/90 | 5/01/91 | NA | 11/26/91 | 5/28/92 | 8/12/92 | 9/1/92 | | |
| 13 | SITE UZ MODELING & SYNTHESIS/USGS | 8.3.1.2.2.9 | 1/25/91 | NA | 2/27/92 | | | | | | | |
| 14 | CHAR SITE SAT ZONE GRD W FLOW SYS/LANL (.7) | 8.3.1.2.3.1 | 2/8/88 | NA | 7/15/89 | 9/1-2/89 | 11/16/89 | 1/-/90 | 2/22/90 | 4/6/90 | 12/6/91 | DEFERRED |
| 15 | CHAR SITE SAT ZONE GRD W FLOW SYS.USGS (.1-.6) | 8.3.1.2.3.1 | 5/31/89 | 6/15/89 | 11/1/89 | 4/4-17/90 | 5/18/90 | 10/15/90 | 2/13/91 | 3/7/91 | 12/6/91 | DEFERRED |
| 14 R1 | CHAR SITE SAT ZONE GRD W FLOW SYS/LANL (.8) | | | | | | | | | | | |
| 16 | CHAR SAT ZONE HYDROCHEM/USGS | 8.3.1.2.3.2 | 3/28/90 | 5/9/90 | 11/27/90 | 5/21-22/91 | 11/27/91 | 3/11/92 | 4/22/92 | 6/5/92 | | |
| 17 | SAT ZONE HYDRO SYSTEM SYNTH AND MODELING/USGS | 8.3.1.2.3.3 | 9/4/90 | 10/12/90 | 8/30/91 | NA | 3/31/92 | 10/19/92 | | | | |
| 18 | GROUND-WATER CHEMISTRY MODEL/LANL | 8.3.1.3.1.1 | 3/15/91 | NA | 5/6/92 | | | | | | | |
| 19 | MIN, PET, CHEM OF TRANSPORT PATHWAYS/LANL | 8.3.1.3.2.1 | 1/22/88 | 5/24/88 | 7/13/88 | 8/4-5/88 | 12/23/88 | 9/12/89 | 6/13/89 | 11/30/89 | 8/20/90 | 3/13/91 |
| 20 | HIST OF MIN AND GEOCHEM ALT OF YUCCA MTN/LANL | 8.3.1.3.2.2 | 3/28/88 | NA | 5/25/89 | 6/1/89 | 6/13/91 | 9/23/91 | 12/18/91 | 1/31/92 | 4/27/92 | DEFERRED |
| 21 | NAT ANLOG HYDROTHERM SYS IN TUFF/LANL | 8.3.1.3.3.1 | | | | | | | | | | |
| 22 | KINETICS AND THERMODYN OF MIN EVOL/LANL | 8.3.1.3.3.2 | 2/23/89 | 3/1/89 | 11/1/89 | 3/14/90 | | | | | | |
| 22 | CONCEPTUAL MODEL OF MINERAL EVOL/LANL | 8.3.1.3.3.3 | 2/23/89 | 3/1/89 | 11/1/89 | 3/14/90 | | | | | | |
| 24 | BATCH SORPT STUDIES AND DEVEL SORPT MODELS/LANL | 8.3.1.3.4.1/3 | 10/28/92 | 11/4/92 | | | | | | | | |
| 25 | BIOLOGICAL SORPTION & TRANSPORT/LANL | 8.3.1.3.4.2 | 12/12/88 | 1/5/89 | 3/12/90 | 6/21/90 | 8/28/91 | 12/7/91 | | | | |
| 26 | DISSOLVED SPECIES CONC LIMITS AND COLLOID BEH/LANL | 8.3.1.3.5.1/2 | 9/7/90 | NA | 11/8/91 | NA | 10/21/92 | | | | | |
| 27 | DYNAMIC TRANSPORT COLUMN EXPERIMENTS/LANL | 8.3.1.3.6.1 | 7/24/89 | 8/9/89 | 5/24/90 | 8/29/90 | | | | | | |
| 28 | DIFFUSION/LANL | 8.3.1.3.6.2 | 7/24/89 | 8/9/89 | 5/10/90 | 8/30/90 | | | | | | |
| 29 | RETARDATION SENSITIVITY ANALYSIS/LANL | 8.3.1.3.7.1 | 12/14/88 | 2/8/89 | 3/12/90 | 7/31/90 | 6/18/91 | 7/28/92 | 8/11/92 | 9/1/92 | | |
| 30 | DEMON APPLI LAB DATA TO REPOS TRANS CALC/LANL | 8.3.1.3.7.2 | | | | | | | | | | |
| 31 | GASEOUS RAD TRANS CALCS AND MEASURE/LANL | 8.3.1.3.8.1 | | | | | | | | | | |
| 32 | CHAR VERT/LAT DIST STRAT UNITS SITE AREA/USGS (.1,.2,.4) | 8.3.1.4.2.1 | 4/12/90 | 5/10/90 | 2/8/91 | 12/20/91 | 2/3/92 | 4/30/92 | 6/9/92 | 6/22/92 | | |
| 32 R1 | CHAR VERT/LAT DIST STRAT UNITS SITE AREA/USGS (.3,.5) | 8.3.1.4.2.1 | | | | | | | | | | |

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| # | SP NAMES/CODE Also Available On Aperture Card | SP NUMBER | SUBMIT TO YMP | SCREENING | COMMENTS | COMMENT | PI | VERIFY | PO | SUBMIT | NRC | NRC |
|-------|--|--------------|------------------|-----------|----------|------------|----------|----------|----------|---------|----------|----------|
| | | | | REVIEW | TO PI | RESOL | REVISION | COMMENT | APPROVE | TO NRC | PHASE I | PHASE II |
| | | | | COMPLETE | | MEETING | COMPLETE | RESOL | | | | REVIEW |
| 34 | CHAR STRUCTURAL FEATURES W/IN SITE AREA/USGS | 8.3.1.4.2.2 | 9/4/87 | NA | Done | 10/22/87 | 4/13/88 | 2/3/89 | 2/03/89 | 2/9/89 | DEFERRED | |
| 34 R1 | 2 MORE ACTIVITIES (3,5)/USGS | 8.3.1.4.2.2 | 2/27/90 | 3/22/90 | 8/21/90 | 6/13/91 | 7/29/91 | 2/10/92 | 4/22/92 | 6/15/92 | | |
| 35 | THREE-DIMENSIONAL GEOLOGIC MODEL/USGS | 8.3.1.4.2.3 | | | | | | | | | | |
| 36 | SYST ACQ SITE-SPEC SUBSURF INFO/SNL | 8.3.1.4.3.1 | 3/27/90 | 4/13/90 | 10/2/90 | 7/1/92 | 7/28/92 | 9/4/92 | | | | |
| 37 | THREE-DIMENSIONAL ROCK CHAR MODELS/SNL | 8.3.1.4.3.2 | | | | | | | | | | |
| 38 | CHAR MODERN REGIONAL CLIMATE/USGS | 8.3.1.5.1.1 | | | | | | | | | | |
| 39 | PALEOCLIM STUDY: LAKE, PLAYA, MARSH DEPS/USGS | 8.3.1.5.1.2 | 10/25/90 | NA | 3/27/91 | NA | 5/9/91 | 10/25/91 | 10/31/91 | 12/6/91 | 4/27/92 | DEFERRED |
| 40 | CLIMATIC IMPLICATION TERREST PALEOECOLOGY/USGS | 8.3.1.5.1.3 | 2/11/91 | NA | 6/25/91 | NA | DONE | 12/11/91 | 1/17/92 | 6/5/92 | 9/3/92 | |
| 41 | ANALYSIS PALEOENVI HIST YUCCA MTN REGION/USGS | 8.3.1.5.1.4 | 3/30/90 | 4/13/90 | 8/13/90 | 10/9-11/90 | 10/24/90 | 1/9/91 | 5/29/91 | 6/24/91 | 12/06/91 | DEFERRED |
| 42 | PALEOCLIM-PALEOENVIRO SYNTHESIS/USGS | 8.3.1.5.1.5 | | | | | | | | | | |
| 43 | CHAR FUTURE REG CLIMATES AND ENVIRONS/SNL | 8.3.1.5.1.6 | 6/7/91 | 7/10/91 | 1/30/92 | N/A | | | | | | |
| 44 | CHAR OF THE QUATERNARY REG HYDRO/USGS (3,4,5) | 8.3.1.5.2.1 | 1/26/88 | NA | 12/9/88 | 12/20/88 | 5/15/89 | 6/8/89 | 6/08/89 | 7/10/89 | 11/24/89 | 6/08/90 |
| 44 R2 | CHAR OF THE QUATERNARY REG HYDRO/USGS (.1) | 8.3.1.5.2.1 | 9/25/90 | NA | 8/8/91 | NA | 3/31/92 | 8/10/92 | | | | |
| 45 | CHAR FUTURE REG HYDRO DUE TO CLI CHANGES/USGS | 8.3.1.5.2.2 | 1/16/91 | NA | 8/7/91 | NA | 5/1/92 | 7/14/92 | | | | |
| 46 | DISTRIB AND CHAR PRESENT AND PAST EROSION/USGS | 8.3.1.6.1.1 | | | | | | | | | | |
| 47 | INFLU FUT CLI COND ON LOC & RATES OF ERO/USGS | 8.3.1.6.2.1 | | | | | | | | | | |
| 48 | EVAL EFFECT OF FUT TECT ON ERO AT YUC MTN/USGS | 8.3.1.6.3.1 | | | | | | | | | | |
| 49 | DEV TOPICAL RPT EFFECTS OF ERO ON THE HYDRO, GEOCHEM, AND ROCK CHAR AT YUCCA MTN/USGS | 8.3.1.6.4.1 | | | | | | | | | | |
| 50 | PROB MAGMATIC ERUPT PENETRATE THE REPOS/LANL | 8.3.1.8.1.1 | 3/29/89 | 4/5/89 | 9/12/89 | 9/28/89 | 6/19/90 | 9/10/90 | 9/19/90 | 3/5/91 | 10/5/91 | 7/10/92 |
| 51 | PHYSICAL PROCESSES OF MAGMATISM AND EFFECTS/LANL | 8.3.1.8.1.2 | 10/21/92 | 10/26/92 | | | | | | | | |
| 52 | ANAL WST PKG RUP DUE TO TECT PROC & EVENT/SAIC | 8.3.1.8.2.1 | 12/15/89 | 1/31/90 | 10/30/90 | 11/20/91 | 12/10/91 | 8/11/92 | | | | |
| 53 | ANAL EFFECTS OF TECT PROC & EVENT ON AVE PERC FLUX RATES OVER REPOS/USGS | 8.3.1.8.3.1 | | | | | | | | | | |
| 54 | ANAL EFF OF TECT PROC&EVENT CHGS WTR TBLE ELV/USGS | 8.3.1.8.3.2 | | | | | | | | | | |
| 55 | ANAL EFF OF TECT PROC & EVENT ON LOCAL FRAC PERM AND EFFECTIVE POROSITY/USGS | 8.3.1.8.3.3 | | | | | | | | | | |
| 56 | ANAL EFF TECT PROC&EVENT ON RK GEOCHEM PROP/USGS | 8.3.1.8.4.1 | | | | | | | | | | |
| 57 | CHAR OF VOLCANIC FEATURES/LANL | 8.3.1.8.5.1 | 12/14/88 | 1/17/89 | 6/20/89 | 7/12/89 | 1/2/90 | 3/15/90 | 4/18/90 | 5/15/90 | 8/20/90 | 3/18/91 |
| 58 | CHAR IGNEOUS INTRUSIVE FEATURES/USGS | 8.3.1.8.5.2 | 10/13/92 | 10/16/92 | | | | | | | | |
| 59 | INVEST FOLDS IN MIOCENE AND YNG RKS OF REG/USGS | 8.3.1.8.5.3 | | | | | | | | | | |
| 60 | EVAL NAT PROC THAT COULD AFFECT LG TERM SURVIVABIL SURFACE MARKER SYS AT YUCCA MTN/M&O | 8.3.1.9.1.1 | | | | | | | | | | |
| 61 | NAT RES ASSESS YUCCA MTN, NYE COUNTY/USGS | 8.3.1.9.2.1 | 7/13/90 | 8/16/90 | 1/7/91 | NA | 1/13/92 | 9/28/92 | | | | |
| 62 | WATER RES ASSESS YUCCA MTN, NV/SAIC | 8.3.1.9.2.2 | 10/6/89 | 1/30/90 | 8/15/90 | 5/9/91 | 12/26/90 | 6/13/91 | 8/26/91 | 9/20/91 | 5/4/92 | |
| 63 | EVAL DATA NEEDED TO SUPP ASSESS LIKLIHOOD FUT INADVER HUMAN INTRU YUC MTN EXPLO/EXT NAT RES/M&O | 8.3.1.9.3.1 | | | | | | | | | | |
| 64 | EVAL POTENTIAL EFFECT OF EXPLOIT NAT RES ON HYDRO | 8.3.1.9.3.2 | | | | | | | | | | |

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| # | SP NAMES/CODE | SP NUMBER | SUBMIT TO YMP | SCREENING REVIEW COMPLETE | COMMENTS TO PI | COMMENT RESOL MEETING | PI REVISION COMPLETE | VERIFY COMMENT RESOL | PO APPROVE | SUBMIT TO NRC | NRC PHASE I REVIEW | NRC PHASE II REVIEW |
|-------|--|----------------|---------------|---------------------------|----------------|-----------------------|----------------------|----------------------|------------|---------------|--------------------|---------------------|
| | CHAR AT YUCCA MTN/M&O | | | | | | | | | | | |
| 65 | METEOROLOGICAL DATA COLLECT YUCCA MTN SITE/SAIC | 8.3.1.12.2.1 | 9/28/90 | NA | 2/4/91 | 2/25/91 | 2/21/91 | 2/26/91 | 3/20/91 | 5/16/91 | 11/12/91 | NONE |
| 65 R1 | METEOROLOGICAL DATA COLLECT YUCCA MTN SITE/SAIC, REV 1 | 8.3.1.12.2.1 | 3/31/92 | 4/21/92 | 6/17/92 | | | | | | | |
| 66 | STUDIES TO PROVIDE SOIL/ROCK PROP OF POTENTIAL LOCATIONS OF SURFACE/SUBSURFACE FACILITIES/USGS | 8.3.1.14.2 | 7/15/91 | 7/23/91 | 8/11/91 | NA | 8/21/91 | 9/22/91 | 10/01/91 | 10/16/91 | 1/24/92 | |
| 67 | LAB THERMAL PROPERTIES/SNL | 8.3.1.15.1.1 | 3/17/88 | NA | 11/1/89 | 12/5/89 | 3/16/90 | 5/23/90 | 10/21/90 | 1/25/91 | DEFERRED | |
| 67 R1 | LAB THERMAL PROPERTIES/SNL | 8.3.1.15.1.1 | 11/3/92 | 11/9/92 | | | | | | | | |
| 68 | LAB THERMAL EXPANSION TESTING/SNL | 8.3.1.15.1.2 | 12/1/88 | 12/20/88 | Done | 8/1/89 | 11/20/89 | 5/23/90 | 8/21/90 | 10/4/90 | DEFERRED | |
| 68 R1 | LAB THERMAL EXPANSION TESTING/SNL | 8.3.1.15.1.2 | 11/3/92 | 11/9/92 | | | | | | | | |
| 69 | LAB DETERMIN MECH PROP INTACT ROCK/SNL | 8.3.1.15.1.3 | 2/8/88 | NA | 7/6/88 | 7/7/88 | 11/29/88 | | 5/21/91 | 6/21/91 | DEFERRED | |
| 70 | LAB DETERMIN MECH PROP FRACTURES/SNL | 8.3.1.15.1.4 | 10/23/91 | 2/5/92 | 5/12/92 | | | | | | | |
| 71 | EXCAVATION INVESTIGATIONS/SNL | 8.3.1.15.1.5 | 3/26/87 | NA | Done | 6/9/87 | 9/1/87 | 5/27/88 | 1/09/89 | 2/9/89 | DEFERRED | |
| 72 | IN SITU THERMOMECH PROP/SNL | 8.3.1.15.1.6 | | | | | | | | | | |
| 73 | IN SITU MECHANICAL PROP/SNL | 8.3.1.15.1.7 | | | | | | | | | | |
| 74 | IN SITU DESIGN VERIFICATION/SNL | 8.3.1.15.1.8 | 3/20/90 | 4/12/90 | 10/10/91 | NA | | | | | | |
| 75 | CHAR SITE AMBIENT STRESS CONDITIONS/USGS (2) | 8.3.1.15.2.1 | 9/22/87 | NA | Done | 12/4/87 | 2/23/88 | 2/9/89 | 1/11/89 | 2/9/89 | DEFERRED | |
| 75 R1 | CHAR SITE AMBIENT STRESS CONDITIONS/SNL (.1) | 8.3.1.15.2.1 | | | | | | | | | | |
| 76 | CHAR SITE AMBIENT THERMAL COND/USGS | 8.3.1.15.2.2 | 10/13/92 | 10/16/92 | | | | | | | | |
| 77 | CHAR OF FLOOD POTENTIAL YUCCA MTN SITE/USGS | 8.3.1.16.1.1 | 3/30/89 | 5/2/89 | 10/13/89 | 4/18/90 | 4/27/90 | 8/6/90 | 9/17/90 | 10/11/90 | 5/8/91 | NONE |
| 78 | LOC OF ADEQ WATER SUPPLY CONST OPER, CLOS, DECOMM OF A MGDS AT YUCCA MTN/SAIC | 8.3.1.16.2.1 | | | | | | | | | | |
| 79 | DETERMINE PRECLOS HYDRO COND UZ YUCCA MTN/USGS | 8.3.1.16.3.1 | | | | | | | | | | |
| 80 | POTENTIAL FOR ASH FALL AT SITE/LANL | 8.3.1.17.1.1 | | | | | | | | | | |
| 81 | FAULTING POTENTIAL AT REPOSITORY/SNL | 8.3.1.17.2.1 | | | | | | | | | | |
| 82 | RELEVANT EARTHQUAKE SOURCES/USGS | 8.3.1.17.3.1 | 8/1/90 | 8/22/90 | 12/28/90 | NA | 5/1/91 | 11/15/91 | 12/18/91 | 1/16/92 | 5/18/92 | |
| 83 | UNDERGROUND NUCLEAR EXPLOSION SOURCES/SNL | 8.3.1.17.3.2 | | | | | | | | | | |
| 84 | GRD MOTION FROM REG EARTHQUAKE AND UNE#/USGS | 8.3.1.17.3.3.1 | | | | | | | | | | |
| 85 | GRD MOTION FROM REG EARTHQUAKE AND UNE#/SNL | 8.3.1.17.3.3.2 | 8/1/90 | 8/10/90 | 2/27/92 | NA | | | | | | |
| 86 | EFFCT LOCAL SITE GEOL ON SRF&SUBSRF MOTION/USGS | 8.3.1.17.3.4 | 7/6/90 | 7/23/90 | 1/23/91 | NA | 4/16/91 | 8/26/91 | 11/14/91 | 12/4/91 | 6/8/92 | NONE |
| 87 | GRD MOTION AT SITE FROM CONTROL SEIS EVENT/USGS | 8.3.1.17.3.5 | 10/4/90 | NA | 2/27/92 | NA | 4/14/92 | | | | | |
| 88 | PROBABILISTIC SEISMIC HAZARD ANALYSES/SNL | 8.3.1.17.3.6 | | | | | | | | | | |
| 89 | HISTORICAL AND CURRENT SEISMICITY/USGS | 8.3.1.17.4.1 | 10/17/89 | 10/25/89 | 4/30/90 | 6/20/90 | 7/6/90 | 9/4/90 | 9/17/90 | 10/22/90 | 5/14/91 | NONE |
| 90 | LOC & RECENCY OF FAULT NEAR PROSPEC SUR FACIL/USGS | 8.3.1.17.4.2 | 12/6/88 | 12/14/88 | Done | 1/19/89 | 2/16/89 | 6/21/89 | 5/22/89 | 7/10/89 | 11/24/89 | 3/16/90 |
| 91 | QT FLT 100KM YUCCA MTN, INCL WALKER LANE/USGS | 8.3.1.17.4.3 | 3/25/92 | 4/6/92 | 6/17/92 | N/A | 9/22/92 | | | | | |
| 92 | QUAT FAULT PROXIMAL TO SITE W/IN NE-TREND FAULT ZONES/USGS | 8.3.1.17.4.4 | 8/3/92 | 8/5/92 | 9/25/92 | | | | | | | |
| 93 | DETACH FAULTS AT OR PROX TO YUCCA MTN/USGS | 8.3.1.17.4.5 | 5/1/90 | 5/9/90 | 5/21/91 | 2/6/92 | 3/25/92 | 6/9/92 | 7/20/92 | 8/12/92 | | |
| 94 | QUAT FAULTING W/IN SITE AREA/USGS | 8.3.1.17.4.6 | 10/14/88 | NA | Done | 4/13/89 | 5/25/89 | 10/11/90 | 1/23/91 | 2/19/91 | 10/3/91 | NONE |

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Study Plan Tracking Sheet

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| # | SP NAMES/CODE | SP NUMBER | SUBMIT TO YMP | SCREENING REVIEW COMPLETE | COMMENTS TO PI | COMMENT RESOL MEETING | PI REVISION COMPLETE | VERIFY COMMENT RESOL | PO APPROVE | SUBMIT TO NRC | NRC PHASE I REVIEW | NRC PHASE II REVIEW |
|-----|--|---------------|---------------|---------------------------|----------------|-----------------------|----------------------|----------------------|------------|---------------|--------------------|---------------------|
| 95 | SUBSUR GEOMET AND CONCEALED EXTEN OF QUAT FAULTS AT YUCCA MTN/USGS | 8.3.1.17.4.7 | | | | | | | | | | |
| 96 | STRESS FIELD WITHIN/PROX TO SITE AREA/USGS | 8.3.1.17.4.8 | | | | | | | | | | |
| 97 | TECT GEOMORPH YUCCA MTN REG/USGS | 8.3.1.17.4.9 | | | | | | | | | | |
| 98 | GEODETIC LEVELING/USGS | 8.3.1.17.4.10 | 3/30/90 | 4/19/90 | 8/8/90 | 9/20/90 | 9/21/90 | 10/15/90 | 1/18/91 | 2/14/91 | 10/4/91 | NONE |
| 99 | CHAR REG LATERAL CRUSTAL MOVEMENT/USGS | 8.3.1.17.4.11 | | | | | | | | | | |
| 100 | TECTONIC MODELS AND SYSTHESIS/USGS | 8.3.1.17.4.12 | | | | | | | | | | |
| 101 | SEAL MATERIAL PROPERTIES DEVELOPMENT/SNL | 8.3.3.2.2.1 | | | | | | | | | | |
| 102 | CHAR CHEM AND MIN CHANGES POSTEMPLAC ENVIRO/LLNL | 8.3.4.2.4.1 | 11/6/87 | NA | 3/13/90 | | | | | | | |
| 103 | HYDRO PROP OF WASTE PKG ENVIRO/LLNL | 8.3.4.2.4.2 | 8/2/88 | NA | 3/23/90 | | | | | | | |
| 104 | MECH ATTRIBUTES OF WASTE PKG ENVIRO/LLNL | 8.3.4.2.4.3 | 6/28/89 | 7/11/89 | 3/13/90 | 7/8/91 | 9/27/91 | | | | | |
| 105 | ENG BARRIER SYSTEM FIELD TESTS/LLNL | 8.3.4.2.4.4 | | | | | | | | | | |

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