



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

Reply to:

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M E M O R A N D U M

DATE: June 10, 1989

FOR: John J. Linehan, Director, Repository Licensing and  
Quality Assurance Project Directorate (HLPD),  
Division of High-Level Waste Management

FROM: Paul T. Prestholt, Sr. DR - YMP

SUBJECT: Yucca Mountain Project (YMP) Site Report for the month  
of May, 1989

I. GEOLOGY

A. Technical Assessment Review (TAR) of the resistivity anomaly in Coyote Wash reported in USGS Open File Report (OFR) 82-182 by Christian Smith and Howard P. Ross, Earth Science Laboratory, University of Utah Research Institute and D. B. Hoover, U.S. Geological Survey (USGS).

In response to concerns expressed by the NRC staff, the DOE Yucca Mountain Project Office (YMPO) has set up a TAR to review the relevant geophysical and geological data and interpretations concerning the resistivity anomaly cited in OFR 82-182 and called a fault in that document. Members of the TAR team are:

8906220142 890610  
PDR WASTE PDC  
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NH03

Richard Lee	Chairperson	SAIC
David Dobson	Geology	DOE-YMPO
Mohamed Mosumder	Geophysics	DOE-Hq
Jeff Kimball	Geophysics and Geology	DOE-Hq
Ernest Hardin	Geophysics (team leader)	SAIC
Terry Grant	Geology (team leader)	SAIC
Forrest Peters	Geophysics (QA specialist)	SAIC
David Cummings	Geophysics and Geology	SAIC
Gerald L. Shideler	Geology	USGS
Adel Zhody	Geophysics	USGS
Richard Snyder	Geology	USGS
David Fenster	Geology	Weston
Thomas E. Hinkebein	Engineering	SNL

The TAR secretary is Marshall Davenport, SAIC and David Dobson is the DOE-YMPO Branch Chief responsible for the TAR.

The Exploratory Shaft Facility (ESF) resistivity anomaly (fault) TAR schedule is (from the TAR announcement memo):

<u>WEEK</u>	<u>GOAL</u>
May 22, 1989	TAR chairperson makes contact with each team member; initiate TAR and distribute Plan; define and qualify team; distribute TAR package.
May 26, 1989	Team members have telephone conferences with team leaders; reading assignments are completed; strategies are defined.
May 30, 1989	Preparation for field trip to Coyote Wash area; continuation of work.
June 7, 1989	Field trip to Coyote Wash taking one full day in the field; one to four days of additional work as required by the Geology team leader.

June 12, 1989 Any re-interpretation of geologic data completed.

June 19, 1989 Any re-interpretation of resistivity data completed.

June 26, 1989 TAR team caucus; complete preliminary draft of the Review Record Memorandum (RRM).

July 10, 1989 Final RRM completed.

The following is the complete text of the TAR sections "Background", "Purpose" and "Scope of Technical Assessment Review":

"Background: U. S. Geological Survey Open File Report 82-182 (OFR 82-182) shows an interpretation of geophysical resistivity data that indicates a fault may be present near the proposed exploratory shaft site. The NRC has reviewed OFR 82-182 and may request a summary of the actions DOE has taken to address the fault shown by that report. In addition, the NRC may request a summary of the DOE actions that were taken to address the recommendations in Bertram (1984) for additional detailed geological and geophysical work in the vicinity of the exploratory shaft site. The work proposed in the Bertram report was completed; there is a letter report from Dixon to Vieth (1982) on geological mapping and open file reports summarize additional drilling and geophysical work completed in response to the recommendations.

"The NRC staff have also expressed interest in an inferred fault near the exploratory shafts shown on SCP Figure 1-40. This figure is based on faults interpreted from geophysical data shown on a map in U. S. Geological Survey Open File Report 84-792. The OFR report does not give any detail on the data on which the map is based, although OFR 82-182 is referenced. R. Stein (DOE/HQ) requested in March, 1989, that DOE be prepared to talk to NRC on

this topic by the end of April 1989. Although a date for discussion with the NRC has not been firmly established, it is envisioned that this TAR will serve as the basis for such an interaction.

"Purpose: The purpose of the TAR is to: (1) review the data and interpretations on which OFR 82-182 is based; (2) review the results of other geologic and geophysical investigations that relate to the possibility of faulting in the vicinity of the exploratory shafts; and (3) after reviewing the data, the TAR Team will determine the interpretations allowed by the evidence on the presence or absence of faulting in the vicinity of the exploratory shafts.

"The TAR team will also review the existing documentation to determine: (1) how the geologic and geophysical data were considered in making the decision on the location of exploratory shafts; and (2) whether the recommendations of the Bertram (1984) report were adequately implemented.

"Scope of Technical Assessment Review: The following tasks will be accomplished by the Technical Assessment Review Team. The findings of the team will be documented in narrative form in the Review Record Memorandum.

- "1. Review the data collection and processing techniques, and subsequent interpretations, which form the basis for the proposed existence of the small fault shown near the location of the exploratory shafts in U. S. Geological Survey Open File Report 82-182. The Tar team will establish and document criteria for the technical reviews. They will then summarize the original objective and purpose of the work, the limitations of the data, and they will evaluate the interpretations (including alternatives) supported by the data. If appropriate, sources for review criteria will be identified.

- "2. The TAR Team will determine what other geologic and geophysical data are available that may bear on the presence or absence of a fault near the location of the exploratory shafts. The TAR team will review any such data discovered and determine the original purpose of the work, the implications of the data with respect to the presence or absence of faulting in the vicinity of the exploratory shafts, and the limitations of the data.
- "3. At the discretion of the TAR chairperson, the reviews described in 1 and 2, above, may also include a detailed field review of the geologic mapping in the vicinity of the exploratory shafts, or field reviews of the geophysical work by members of the TAR team, or qualified designees. Prior to conducting any proposed field reviews, the TAR team shall establish and document criteria for the review.
- "4. After completing Items 1, 2, and 3, the TAR team will determine whether the possible fault shown in U. S. Geological Survey Open File Report 82-182 was adequately considered during the selection of the exploratory shaft location. The team will develop criteria for the determination, and then evaluate the impacts on the exploratory shaft and ESF Title II design process if it was concluded that a fault did exist.
- "5. The TAR Team should consider, and make recommendations on, future work that should be undertaken as a result of the findings of the technical assessment.
- "6. Following completion of the tasks described above, the TAR Team will compile a report which summarizes the results of the assessment, and specifically addresses at least the following topics.

- "A. Historical perspective: summarize the sequence of events that occurred relevant to this topic, and the documents that exist in YMP files regarding the geological and geophysical work.
- "B. Geophysical perspective: summarize the past work, the rationale for conducting the studies, the interpretations (and alternatives) that are consistent with the data, and the limitations of the data.
- "C. Geological perspective: summarize the rationale for, and the results of, the past studies, the interpretations (and alternatives) that are consistent with the data, and the limitations of the data.
- "D. Results of field checks (optional): summarize any work accomplished, and what results are indicated.
- "E. Summary and recommendations, to include, at a minimum: (A) assessment of the data relevant to the possible presence of a fault near the proposed ESF, (B) evaluation of whether the available data were adequately considered during the process of selecting the proposed shaft locations; (C) perspective on the possible impact on Title II design if the presence of a fault was demonstrated; and (D) recommendations for further action."

The TAR reference package includes:

- Following references contained in three-ring binder:
- Bertram, S.G., 1984. NNWSI Exploratory Shaft Site and Construction Method Recommendation Report, SAND84-1003, Sandia National Laboratories, Albuquerque, NM.
- Chronology of Events, Prepared by T. Grant, 4/89.
- Letter from Dixon (USGS) to Vieth discussing detailed geologic mapping of 5 sites recommended by Ad Hoc TOC Committee.
- Memo from R.C. Lincoln (SNL) to A.E. Stephenson (SNL) with report

"Recommendation of the Site for the NNWSI Exploratory Shaft by the Ad Hoc TDC Committee:, dated 6/25/82.

Scott, R.B., et al, 1984. Geological and Geophysical Evidence of Structures in North-West Trending Washes, Yucca Mountain, Southern Nevada, and their Possible Significance to a Nuclear Waste Repository in the Unsaturated Zone.

USGS-OFR-84-567, Open-File Report, U.S. Geological Survey.

Spengler, R.W., and M.P. Chornack, 1984. Stratigraphic and Structural Characteristics of Volcanic Rocks in Core Hole USW G-4, Yucca Mountain, Nye County, Nevada, with a section on geophysical logs by D.C. Muller and J. E. Kibler, USGS-OFR-84-789, Open-File Report, U.S. Geological Survey.

Spengler, R.W., and J.G. Rosenbaum, 1989. Preliminary Interpretations of Geologic Results Obtained from Boreholes UE25a-4, -5, -6, -7, Yucca Mountain, Nevada Test Site, USGS-OFR-80-929, Open-File Report, U.S. Geological Survey.

Following references containing oversized plates individually bound:

Scott, R.B., and J. Bonk, 1984. Preliminary Geologic Map of Yucca Mountain, Nye County, Nevada, with Geologic Sections, USGS-OFR-494, Open-File Report, U.S. Geological Survey.  
(manila envelope)

Smith, C., and H.P. Ross, 1982. Interpretation of Resistivity and Induced Polarization Profiles with Severe Topographic Effect, Yucca Mountain Area, Nevada Test Site, Nevada, USGS-OFR-82-182, Open-File Report, U.S. Geological Survey.  
(acco binder)

USGS (U.S. Geological Survey) (Comp), 1984. A Summary of Geologic Studies through January 1, 1983, of a Potential High-Level Radioactive Waste Repository Site at Yucca Mountain, Southern Nye County, Nevada, USGS-OFR-84-792, Open-File Report, U.S. Geological Survey, (acco binder with accompanying manila envelope)

I have received one copy of the reference package. The project is preparing a second copy of the package that I will forward as soon as I receive it.

The TAR is being conducted under QA level I.

Because of the amount of publicity that has been given the resistivity anomaly reported in OFR-82-182 by the newspapers in Nevada (clippings forwarded daily), this office will follow the TAR closely.

**B. Prototype drilling:**

During the May TPO meeting, a summary of the prototype drilling/coring program was presented by Dr. Uel Clanton, DOE-YMPO.

The purpose of the YMP prototype drilling/coring program is (from the handout):

- TO TEST THE EQUIPMENT, METHODS AND PROCEDURES THAT WILL EVENTUALLY BE USED DURING SITE CHARACTERIZATION ACTIVITIES
- ♦ Requirements for dry drilling and dry coring during site characterization are unique
    - In normal mining industry dry drilling, the rock is ground up and cuttings are blown to the surface.
  - ♦ However, the Project needs to be able to recover intact core samples from drill holes for further study
    - Any water used during the site characterization drilling process could affect hydrologic experiments and alter the rock's natural state

The prototype drilling/coring program is being conducted in two phases, the first in Utah and the second in Nevada (from the handout):

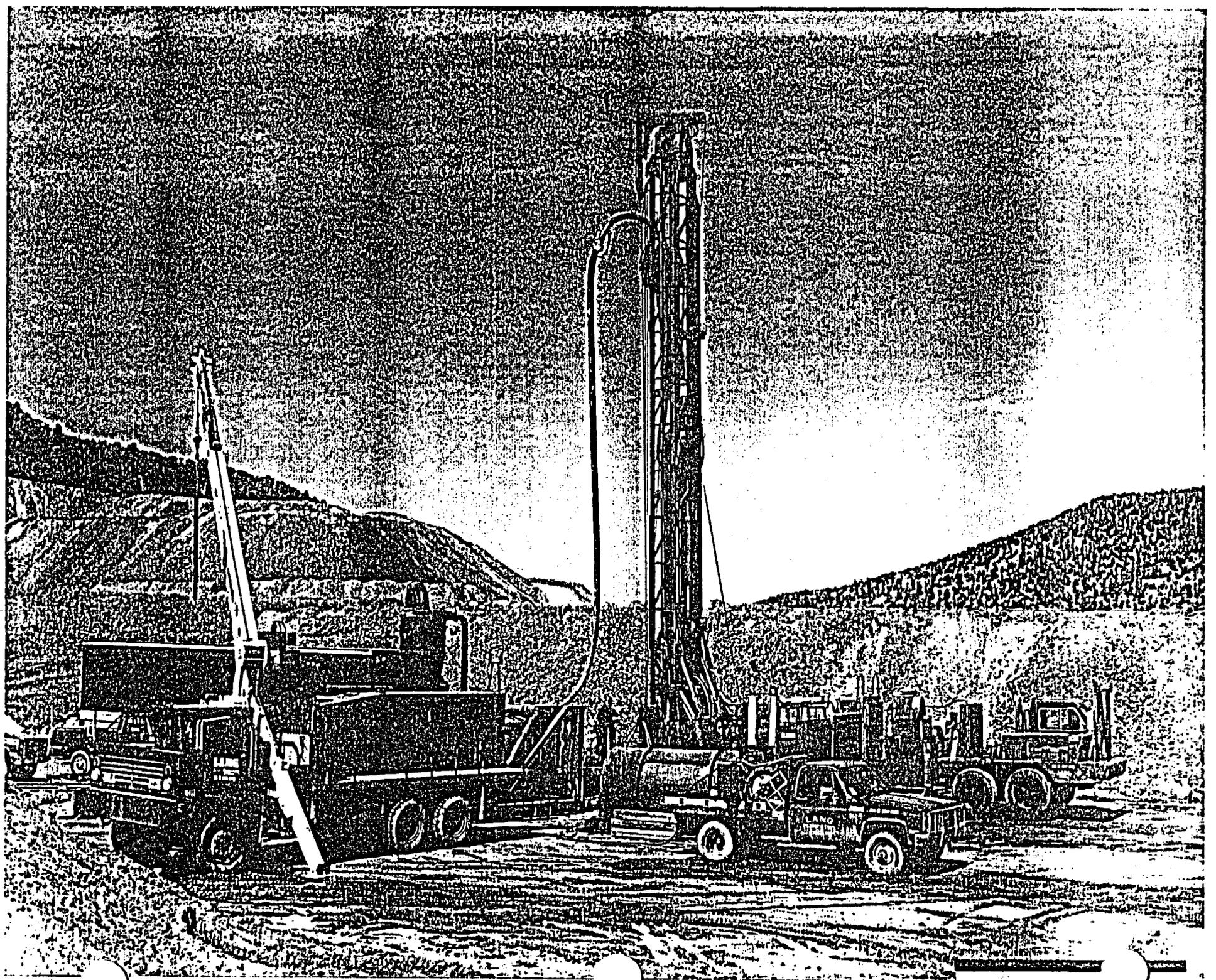
- ♦ Yucca Mountain Project began phase 1 activities on May 15, 1989 in Utah

- † No site characterization data will be collected during prototype drilling in either Utah or Nevada
- † Phase 1 will be performed by the manufacturer of the equipment, Lang Exploratory Drilling, near Tooele, Utah
  - Rock type at this location is silicified limestone
  - Phase 1 includes approximately 20 days of drilling several hundred feet deep to test the equipment
- † State of Nevada and NRC have been invited to observe all tests (See insert #1 photo - Site of Phase 1 prototype dry drilling and dry coring activities near Salt Lake City, Utah)

Phase 2 will be conducted at the Nevada Test Site (NTS), approximately 5 miles south-southeast of proposed Yucca Mountain Repository

- † Starting date for phase 2 is approximately mid-June, pending State approval of an amended NTS air quality permit
- † Purpose is to continue equipment testing in volcanic tuff; finalize quality assurance, sample management and drilling procedures, and train personnel
- † Two holes will be drilled/cored to approximately 1100 feet deep with diameters of 8-inch and 12-inch respectively
  - Three coring methods will be used and then evaluated and compared
  - Drilling is scheduled for approximately 60 days (See inserts #2 photo, #3 map - Planned site of Phase 2 prototype dry drilling and dry coring activities on the Nevada Test Site (with Yucca Mountain in background); Yucca Mountain Project Proposed Prototype Boreholes, respectively)

DDE-YMPD still has not received air quality permits to conduct Phase II prototype drilling on the Nevada Test Site (NTS). On May 4, 1989, DOE and the State of Nevada (State) agreed to modify the NTS air quality permit to include prototype testing. The proposed modification was sent to the State on May 5, 1989. The State requested additional information on May 12



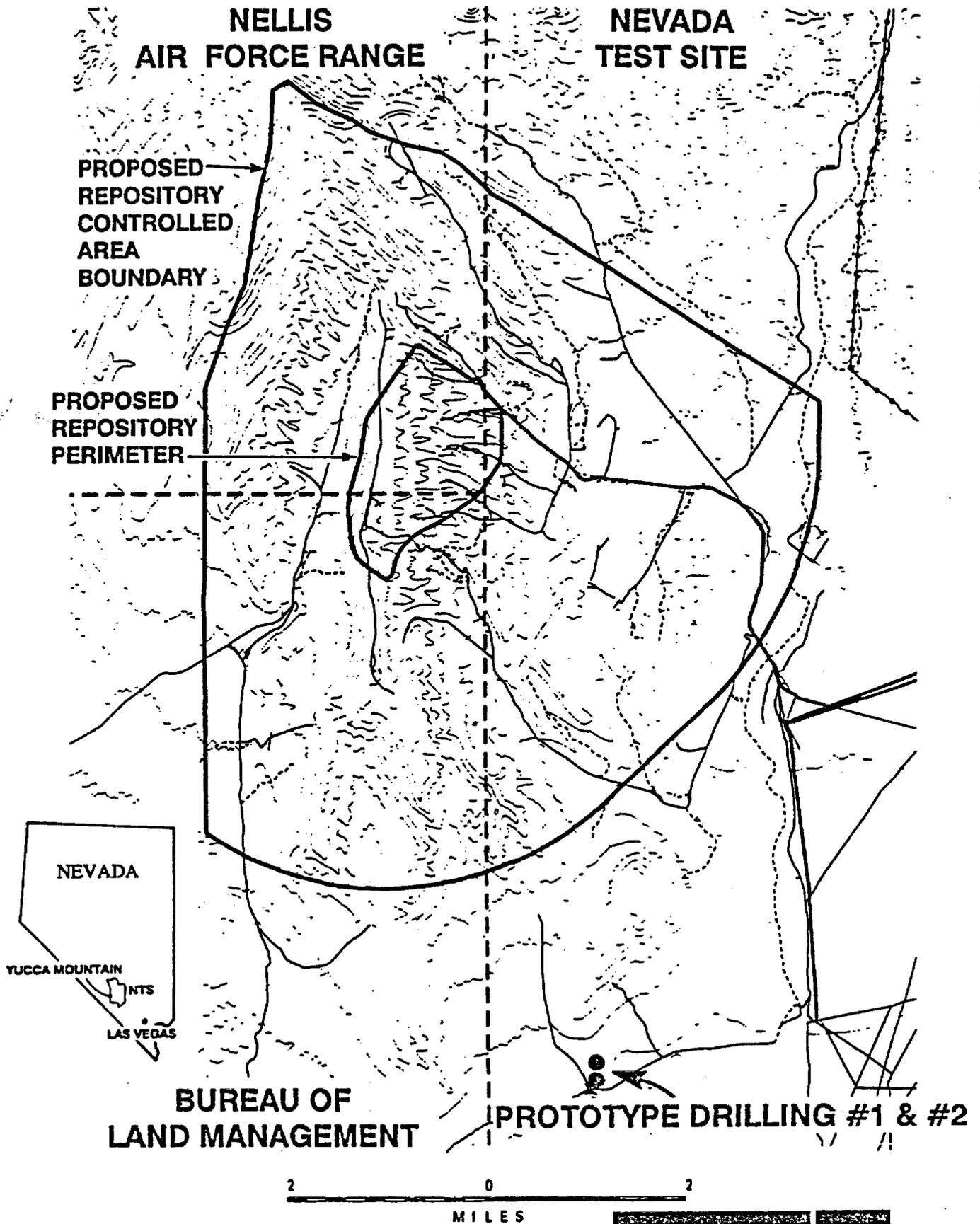
SITE OF PHASE 1 PROTOTYPE DRY DRILLING AND DRY CORING ACTIVITIES NEAR SALT LAKE CITY, UTAH.



INSERT #2 - Page 9(b)

ED SITE OF PHASE 2 PROTOTYPE DRY DRILLING AND DRY CORING ACTIVITIES ON THE NEVADA TEST SITE (WITH YUCCA MOUNTAIN IN BACKGROUND).

# YUCCA MOUNTAIN PROJECT PROPOSED PROTOTYPE BOREHOLES



and DOE-NVD responded on May 15. At this writing (June 10) I understand that the State has requested still more information.

In a June 9 Las Vegas Journal piece (enclosed) by Caryn Shetterly, Mr. Bob Loux, State of Nevada, is quoted as saying "This whining about permits is getting pretty old."

DOE-YMPO is hopeful that State air quality permits will be in hand to allow Phase II to be conducted on the NTS south of Busted Butte and west of 40 mile wash.

This office has been informed (personal conversations with Dr. Uel Clanton, DOE-YMPO) that the rig and drilling systems are working as designed. Dry coring, the activity that was thought to possibly be a problem, has been successfully accomplished. Core recovery, both by wireline and pneumatically up the inner drill pipe and through the large radius gooseneck, has been achieved. Some minor adjustments in the sample recovery system are needed but the overall system is a success.

This office will continue to monitor this activity closely.

## II. HYDROLOGY

A field trip to the NTS and surrounding region by the hydrology section, HLGP is being planned for the week of July 10, 1989. This four day field trip is being coordinated with Dr. Uel Clanton, DOE-YMPO.

Due to the stop work order imposed on the USGS, only the maintenance of ongoing activities is being done at this time.

III. GEOCHEMISTRY - There are no new activities to report.

IV. REPOSITORY ENGINEERING - ESF

Activities in this area are primarily concerned with QA.

V. LICENSING AND DOE-NRC INTERACTIONS

A. During the May TPO meeting, Mr. Maxwell Blanchard, DOE-YMPO, discussed the May 9 and 10 DOE/NRC meeting where NRC staff gave preliminary comments on the SCP to DOE. Mr. Blanchard gave his interpretation of NRC concerns in the areas of Performance Assessment, Quality Assurance, Geosngineering, Waste Package, Geology and Geophysics, Natural Resources, Hydrology and Geochemistry. The handout is enclosed.

Mr. Blanchard presented DOE-YMPO's preliminary overall observations about NRC's concerns. From the handout:

1. The technical concerns raised by NRC speakers (except Geosngineering) suggest that no NRC objections are likely in their SCA; most staff appear to be anxious to see site characterization underway.
2. Geosngineering: If an objection is proposed, it will come from an accumulation of inconsistencies in ESF Title I Design. They may take the position that the inconsistencies are symptomatic of the lack of an effective DOE design control process.

NRC's Concerns could be ameliorated by:

- A. Acquiring their approval of our QA program
- B. Reaching consensus on the applicable portions of the regulations  
(Expansion of DAA??)
- C. Demonstrating an effective design control process exists for ESF Title II Design

B. During the May TPO meeting, Mr. Blanchard also discussed DOE interactions with the Nuclear Waste Technical Review Board (NWTRB). The enclosed handout details this discussion.

There is a meeting with the NWTRB scheduled for June 26-28 to be held in Las Vegas. Scheduled is a one day meeting with the State (the 26th), an introduction to site characterization and

the Yucca Mountain Project by DOE-YMF (the 27th) and a site visit on the 28th.

A proposed agenda for the meeting on the 27th and for the site visit on the 28th is in the enclosed handout.

VI. STATE OF NEVADA INTERACTIONS - None

VII. GENERAL

A. The week of May 22, I attended an OSHA training course in DesPlaines, Illinois (near O'Hare Airport). The purpose for attending the OSHA Institute in DesPlaines was to satisfy provisions in the MOU between the NRC and OSHA relating to NRC-licensed facilities (53 FR 43950, October 31, 1988) dated December 23, 1988.

The MOU states:

"Both NRC and OSHA have jurisdiction over occupational safety and health at NRC-licensed facilities. Because it is not always practical to sharply identify boundaries between the nuclear and radiological safety that NRC regulates and industrial safety that OSHA regulates, a coordinated interagency effort can ensure against gaps in the protection of workers, and at the same time, avoid duplication of effort. The new MOU replaces an existing procedure which outlined the NRC's and OSHA's interagency activities.

"Although NRC does not specifically examine industrial safety during inspections of radiological and nuclear safety, NRC personnel may identify safety concerns within the area of OSHA responsibility, or may receive complaints from an employee about OSHA-covered working conditions. In such instances, NRC will bring the matter to the attention of licensee management or monitor corrective action when appropriate. If significant safety concerns are identified, or if the licensee demonstrates a

pattern of unresponsiveness to identified concerns, the NRC regional office will inform the appropriate OSHA regional office. Also, when known, NRC inspectors will encourage licensees to report to OSHA accidents resulting in a fatality or multiple hospitalizations. It is not the intent of the Commission that NRC inspectors perform the role of OSHA inspectors; however, they are to elevate OSHA safety issues to the attention of OSHA Regional management when appropriate."

It was decided that course number 600, "Collateral Duty Course for Other Federal Agencies" was the most appropriate course offered by OSHA as a first or introduction to OSHA. The course was based on the OSHA regulations 29 CFR parts 1900 to 1910.

The course covered:

- ♦ Subparts D and F; Walking and working surfaces
- ♦ Subpart S; Electrical
- ♦ Subpart N; Material handling and storage
- ♦ A hazard violation workshop
- ♦ Subpart O; Machine guarding
- ♦ Subpart P; Portable tools
- ♦ Subparts E and L; Egress and fire protection
- ♦ Subpart H; Hazardous materials
- ♦ Industrial hygiene
- ♦ Subpart Q; Welding, cutting and brazing

In other words, a broad introduction into the OSHA regulation.

The instructors were all OSHA field inspectors with many years of experience. They were able to illustrate the cold text of the regulation with illustrations and stories from their own experience. The instructors were excellent.

The course is designed to introduce the OSHA regulation to individuals from other Federal Agencies who have safety related

duties. There are other courses that go into detail in each of the above categories.

I believe course 600 is the level of training needed by Division of High-Level Waste personnel to satisfy the NRC-OSHA MOU.

B. Meetings attended during May:

- † May 1; Meeting with Carl Gertz, Manager, DOE-YMP
- † May 3; Meeting with Ted Petrie, DOE-YMPO. Discussed Title II network and schedule and upper tier QALAs
- † May 9; Meeting with Ted Petrie, DOE-YMPO
- † May 9; Meeting with Don Helton, Bob Levitch, and Don Livingston concerning NRC access to the SEPDB
- † May 16; Meeting with Ted Petrie, DOE-YMPO
- † May 16; Meeting with Carl Gertz, Manager, DOE-YMP
- † May 22-26; OSHA course, Des Plaines, Illinois

cc: With enclosures: K. Stablein, R. E. Adler, J. E. Latz

Without enclosures: C. P. Gertz, R. R. Loux, M. Glora,  
D. M. Kunihiro, R. E. Browning, G. Cook,  
L. Kovach, S. Gagner, K. Turner,  
H. Thompson, H. Denton, R. Benero

Enclosures: 6/9/89 Las Vegas Review-Journal article; TPO Meeting Agenda for 5/6/89; TPO Presentation by C. Gertz; DOE/NRC Meeting, 5/9-10/89--NRC's Preliminary Comments on the SCP by M. Blanchard; Interactions with the Nuclear Waste Technical Review Board by M. Blanchard; Summary of Preliminary Prototype Drilling/Coring Program, 5/89; 3 documents, i.e., News release (Ginger King-6/2/89), 5/30/89 letter from Loux to Gertz (St. of NV Preliminary Comments on SCP...), 6/1/89 letter from Hayes to Gertz (Coyote Wash); 5/25/89 letter from Blanchard (Announcement of actions underway by YMPO in response to USNRC concerns re: the geophysically inferred fault in the vicinity of proposed exploratory shaft location)

## Scientists check Yucca Mountain to see if rock can withstand study

By Caryn Shetterly  
Review-Journal

A dozen scientists took a look this week at Yucca Mountain to check for faults that would prevent studies of the rock as a high-level nuclear waste repository, but won't know anything until they can dig into the site.

The trip was prompted after state and federal officials raised questions about the existence of faults at Coyote Wash, where the Department of Energy plans to sink exploratory shafts to analyze the mountain.

A 1982 report by two scientists with the United States Geological Survey indicated electrical resistance measurements showed faulting through the Coyote Wash area.

Federal law prohibits the Energy Department from sinking exploratory shafts within 100 feet of a fault. Exploration also would be prevented should extensive valuable mineral deposits exist at Yucca Mountain.

Energy Department officials say, though, that a 1984 assessment by USGS scientists showed no existence of faults in the area. Max Blanchard, a geologist with the En-

ergy Department, said recently that electrical resistance readings fluctuate depending on rock porosity and moisture, but not necessarily faulting.

The team, which included scientists from the Energy Department, the USGS, Sandia and Los Alamos laboratories, and a local representative of the Nuclear Regulatory Commission, "walked around" the site for about eight hours Wednesday, said team leader David Dobson.

Dobson is a geologist with the Yucca Mountain Projects Office.

"It was just a preliminary field review to check a 1984 map of two (USGS) scientists," he said. "We checked things to see if the map was correct, and it appears to be a good one."

Based on the preliminary analysis, Dobson said, it cannot be said that no faulting exists at Coyote Wash, but it was determined that "nothing large is out there."

Robert Loux, executive director of Nevada's Nuclear Waste Projects Agency, was not satisfied with the team's trip.

He said his office never received

any indication from the Energy Department that the faults did not exist, and he has not received a response to a letter he wrote May 31 to the department asking about faulting at Coyote Wash.

"This whole thing gives the impression that the DOE is not being straight with the public," Loux said Thursday. "If in fact Carl Gertz has in his hands information that suggests faults are not there, he hasn't shared that with us, nor is it included in the site characterization plan."

Gertz is executive director of the Yucca Mountain Projects Office. He said Thursday the Energy Department cannot conduct another set of electrical resistance readings until the state approves an air quality permit to dig into the mountain.

Loux said the Energy Department's application for a state permit is being processed, but would do no good, considering the Bureau of Land Management is the agency that must agree to allow the Energy Department onto the Coyote Wash site.

"This whining about the permits is getting pretty old," he said.

NNHSI PROJECT MANAGER-TECHNICAL PROJECT OFFICER MEETING

LOCATION: 101 Convention Center Drive  
Room 450  
Las Vegas, Nevada

PAGE: 1 of 1

DATE: May 26, 1989

TIME	WHAT	HOW	WHO	EXPECTED OUTCOME	REF. MATERIAL & COMMENTS
9:00 - 9:15	INTRODUCTION/ROLES AGENDA/OUTCOME REVIEW 4/24/89 MINUTES	AROUND THE ROOM ADJUST/AGREE	C. GERTZ ✓	AGREE TO AGENDA/OUTCOME APPROVE MINUTES	PM/TPO MINUTES 4/24/89
9:15 - 9:30	MANAGER FYIs	PRESENT FYIs	C. GERTZ	UNDERSTAND FYI ITEMS	
9:30 - 10:30	FYIs	PRESENT FYIs AROUND THE TABLE - 5 MINUTES	DIVISION DIRECTORS/TPOs	UNDERSTAND FYI ITEMS	
10:30 - 10:45	BREAK				
10:45 - 11:00	SCP MEETING WITH NRC	PRESENT RESULTS OF MEETING	M. BLANCHARD ✓	UNDERSTAND RESULTS	
11:00 - 11:15	NUCLEAR WASTE TECHNICAL REVIEW BOARD	PROVIDE UPDATE	M. BLANCHARD ✓	UNDERSTAND UPDATE	
11:15 - 11:35	PROTOTYPE DRILLING IN UTAH	PROVIDE UPDATE	U. CLANTON	UNDERSTAND UPDATE	
11:35 - 11:55	IRM DISCUSSION	PROVIDE UPDATE	D. HELTON	UNDERSTAND UPDATE	

# **TPO PRESENTATION**

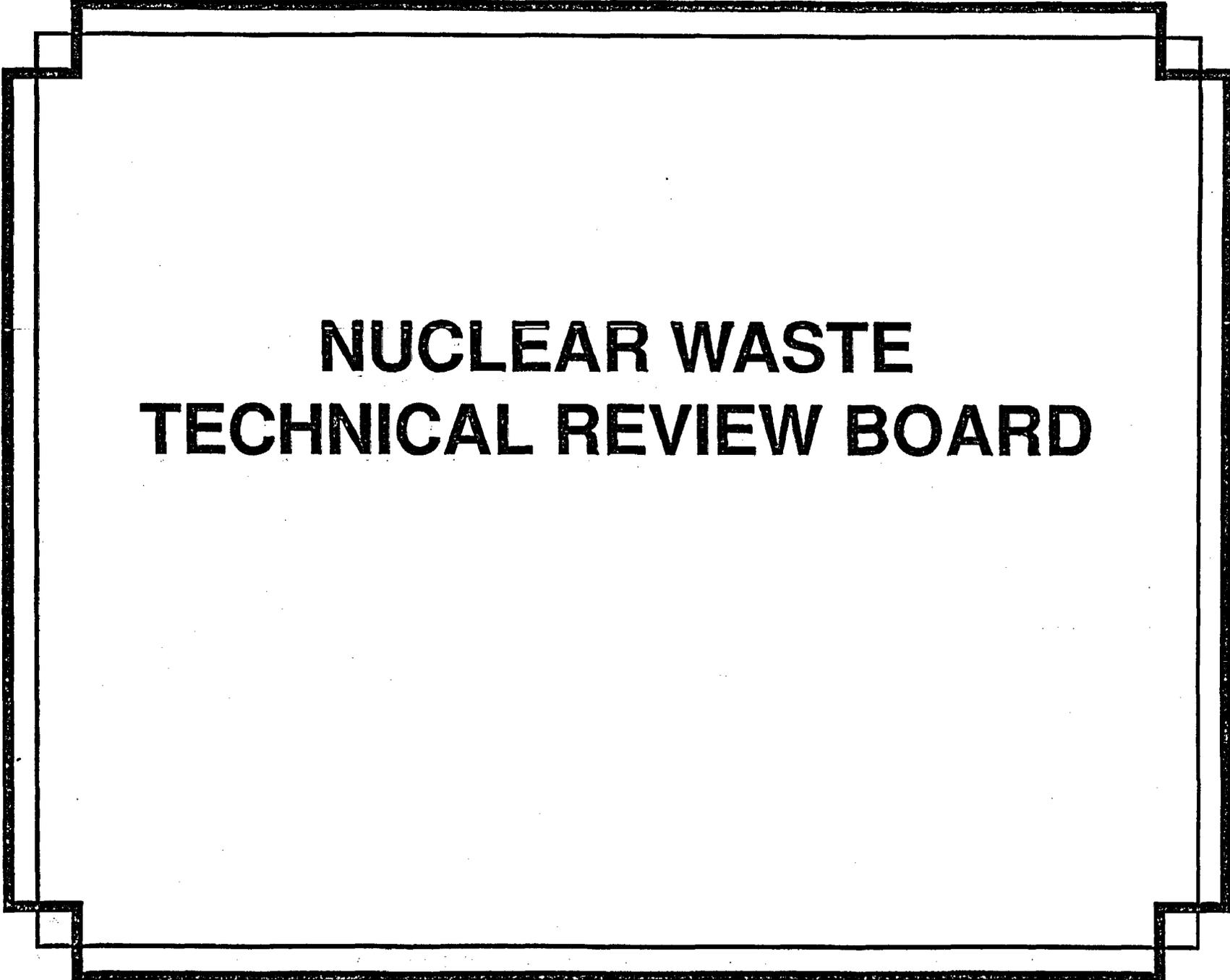
*PRESENTED BY*

**CARL GERTZ**  
**PROJECT MANAGER**

**MAY 26, 1989**

# AGENDA

- **NUCLEAR WASTE TECHNICAL REVIEW BOARD**
- **PROTOTYPE DEVELOPMENT PROGRAM**
- **M&O STATUS**
- **SECRETARY OF ENERGY'S MEETING WITH NEVADA GOVERNOR AND CONGRESSIONAL DELEGATION**
- **EDISON ELECTRIC INSTITUTE VISIT**
- **STATUS OF AIR QUALITY OPERATING PERMIT**
- **OUTREACH ACTIVITIES**

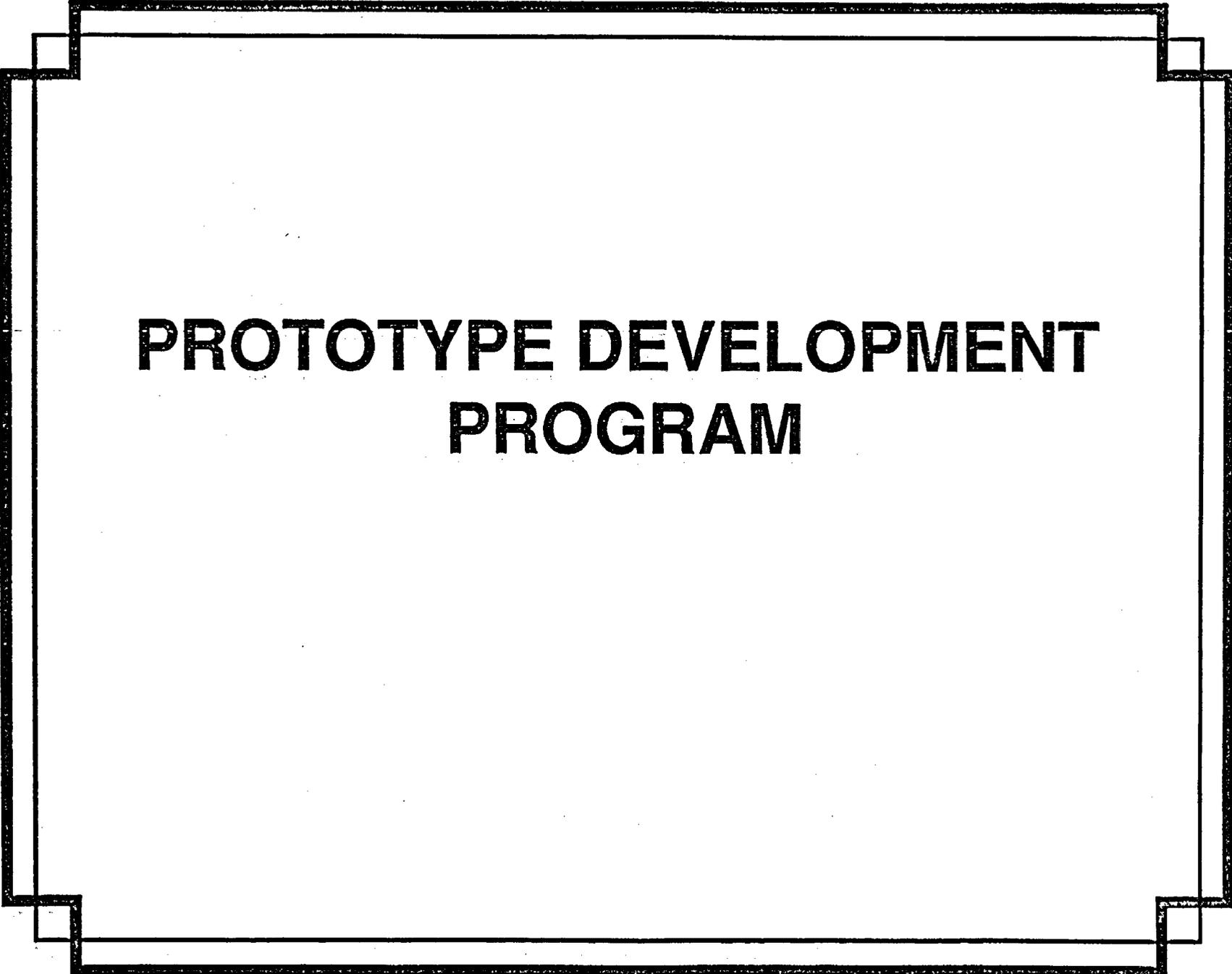


**NUCLEAR WASTE  
TECHNICAL REVIEW BOARD**

# **NWTRB MEETING SCHEDULED IN LAS VEGAS JUNE 26-28, 1989**

- JUNE 26      BRIEFING BY NEVADA NUCLEAR WASTE PROJECT  
OFFICE REPRESENTATIVES**
- JUNE 27      BRIEFING BY YUCCA MOUNTAIN PROJECT OFFICE  
STAFF**
- JUNE 28      YUCCA MOUNTAIN SITE TOUR**

**MEETINGS ON JUNE 26 & 27 TO BE HELD AT THE ST. TROPEZ  
CONFERENCE CENTER**



**PROTOTYPE DEVELOPMENT  
PROGRAM**

Duffy issued a memo.  
 Stated by July get on  
 with it in 3 weeks

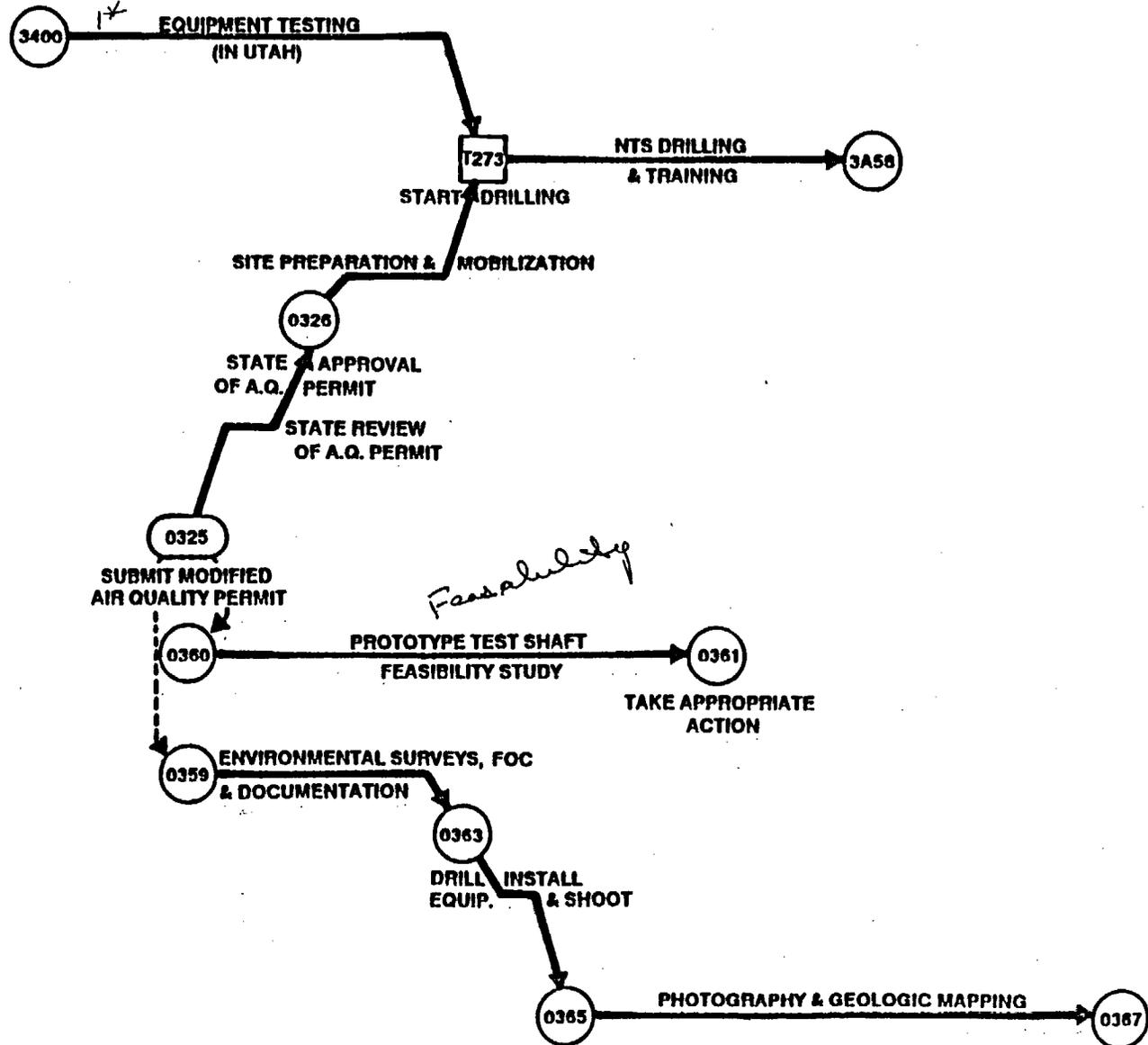
# PROTOTYPE SITE ACTIVITIES

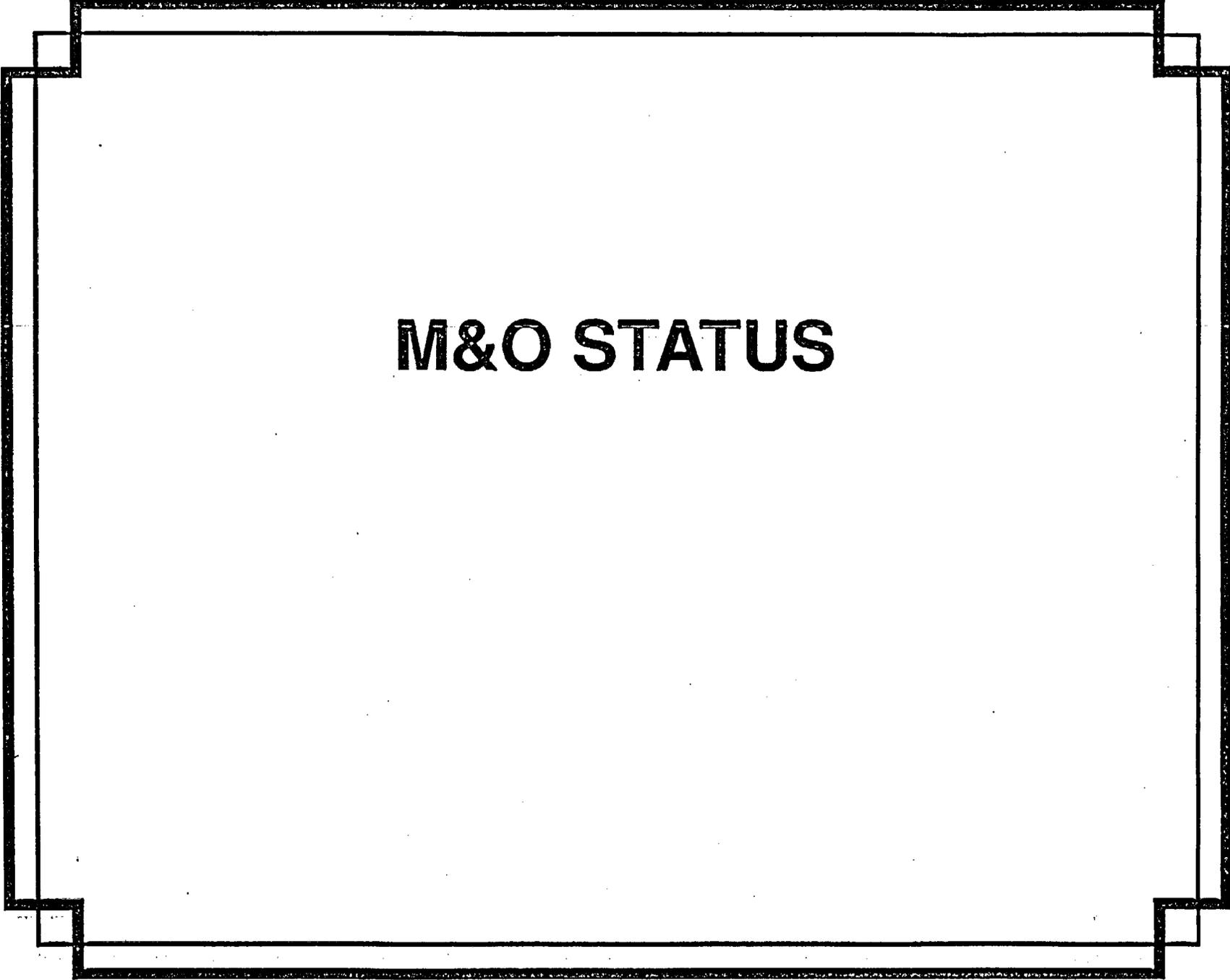


①\* PROTOTYPE BOREHOLES

②\* PROTOTYPE TEST SHAFT

③\* FRAN RIDGE TEST PIT  
 modification





**M&O STATUS**

**SECRETARY WATKINS MEETING  
WITH NEVADA GOVERNOR AND  
CONGRESSIONAL DELEGATION  
MAY 22, 1989**

Represents  
all the (studies)

ACCORD

Jack Ferguson } Concern Big Bucks Spent.  
Kraft. } But Not Actual Design  
lets get on @ it.

mtg. with walkman  
for YMP.

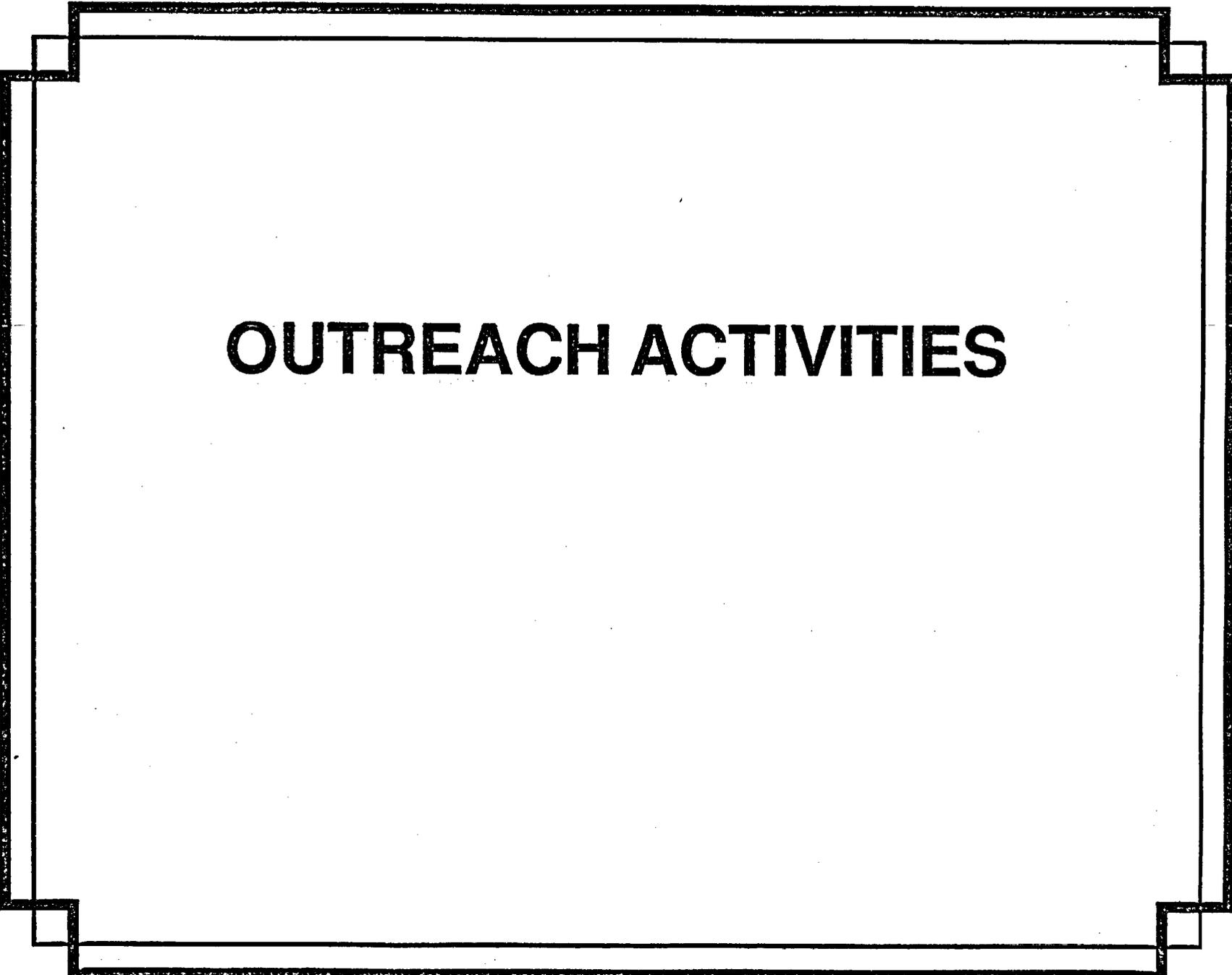
# EDISON ELECTRIC INSTITUTE VISIT MAY 23 & 24, 1989

*Harold Finger  
Ferguson*

# STATUS OF AIR QUALITY OPERATING PERMIT

# **STATUS OF AIR QUALITY OPERATING PERMIT**

- **DOE BELIEVED PROTOTYPE TESTING COVERED BY EXISTING NEVADA TEST SITE (NTS) PERMIT**
  - **ADDITIONAL YUCCA MOUNTAIN PERMIT WAS NOT BELIEVED TO BE REQUIRED FOR PROTOTYPE ACTIVITIES AT NTS**
  
- **DUE TO AMBIGUITY IN NTS PERMIT, DOE AND STATE AGREED ON MAY 4, 1989 TO MODIFY THE NTS PERMIT TO ADDRESS PROTOTYPE TESTING**
  - **PROPOSED MODIFICATION SENT TO STATE ON MAY 5, 1989**
  
- **STATE REQUESTED ADDITIONAL INFORMATION ON MAY 12, 1989, DOE RESPONDED ON MAY 15, 1989; STATE REQUESTED ADDITIONAL INFORMATION MAY 15 - DOE RESPONDED MAY 23, 1989**
  
- **DOE NOW AWAITING STATE RESPONSE**



# **OUTREACH ACTIVITIES**

# OUTREACH ACTIVITIES

## ● RECENT PUBLIC PRESENTATIONS

- NUCLEAR DATA USERS GROUP, CHICAGO
- MENSA, LAS VEGAS
- LEAGUE OF WOMEN VOTERS, ALBUQUERQUE
- EXPLORER'S CLUB OF SOUTHERN CALIFORNIA
- SIGMA XI SCIENTIFIC FRATERNITY, LAS VEGAS
- NEVADA ASSOCIATION OF FLEET MANAGERS

## ● UPCOMING INTERACTIONS

- WIPP TOUR WITH LINCOLN COUNTY OFFICIALS JUNE 2, 1989
- AMERICAN NUCLEAR SOCIETY ANNUAL MEETING JUNE 5-7, 1989
- DOE CONTRACTOR'S TRAFFIC MANAGER ASSOCIATION JUNE 8, 1989
- PATRAM '89 JUNE 12-16, 1989
- COMPETITION ADVOCATES WORKING MEETING JUNE 14-15, 1989
- NUCLEAR WASTE TECHNICAL REVIEW BOARD JUNE 26-28, 1989
- INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT JULY 9-12, 1989

DOE/NRC MEETING

MAY 9 & 10, 1989

NRC'S PRELIMINARY COMMENTS  
ON THE SCP

BY

MAXWELL BLANCHARD  
DIRECTOR, YMP REGULATORY & SITE EVALUATION DIVISION

## PURPOSE OF MEETING

- o NRC MEETING WITH DOE ON MAY 9-10, 1989 TO DISCUSS NRC'S PRELIMINARY CONCERNS ON THE SCP
  
- o NRC MADE SAME PRESENTATION TO THE ACNW ON MAY 11, 1989

## AGENDA FOR NRC PRESENTATIONS

MAY 9

PERFORMANCE ASSESSMENT  
QUALITY ASSURANCE  
GEOTECHNICAL ENGINEERING

1. ESF DESIGN
2. INTEGRATION OF ESF WITH REPOSITORY

MATERIALS ENGINEERING (MATERIALS FOR WASTE PACKAGE)

MAY 10

GEOLOGY  
GEOPHYSICS  
HYDROLOGY  
GEOCHEMISTRY

## PERFORMANCE ASSESSMENT

### NRC CONCERNS

1. PERCEIVED GAPS IN PERFORMANCE ALLOCATION [EXAMPLES GIVEN: USE OF ACTIVITY PARAMETERS IN SOME SITE PROGRAMS (HYDROLOGY); SOME ALLOCATED PARAMETERS APPEAR TO VIOLATE REGULATORY REQUIREMENTS (VOLCANIC EVENT PENETRATING REPOSITORY)]
2. PERCEIVED GAPS AND INCONSISTENCIES IN APPROACH TO ALTERNATIVE CONCEPTUAL MODELS [EXAMPLE: LACK OF EXPLANATION OF THE HIGH-MEDIUM-LOW CATEGORIES IN ASSESSMENTS OF UNCERTAINTIES AND THE NEED TO REDUCE THEM]
3. DATA GATHERING IS NOT YET INTEGRATED WITH PERFORMANCE ASSESSMENT; NO EVIDENCE OF PLANS FOR ITERATIVE PERFORMANCE ASSESSMENTS

## PERFORMANCE ASSESSMENT (CONT'D)

4. CURRENT VALIDATION PROGRAM DOES NOT APPEAR ADEQUATE TO SUBMIT LICENSE APPLICATION -- LONG-DURATION TESTS ARE NOT STARTED EARLY ENOUGH
5. SCP APPEARS TO MIX SCENARIOS, MODELS, AND INITIAL CONDITIONS -- THE LIST OF SCENARIOS IS NOT SHOWN TO BE COMPREHENSIVE AND INTEGRATED
6. APPEARS TO BE EXCESSIVE RELIANCE ON EXPERT JUDGEMENT -- FOCUS OF PROGRAM SHOULD BE ON COLLECTING OBJECTIVE INFORMATION

## QUALITY ASSURANCE

### NRC CONCERNS

1. BEFORE DOE STARTS SITE CHARACTERIZATION, THE QA PROGRAM SHOULD BE APPROVED BY THE NRC
2. NO PERMANENT QA MANAGER AT YMP OR HQ
3. DOE'S APPROACH TO QUALIFYING EXISTING DATA HAS NOT YET BEEN REVIEWED OR APPROVED BY THE NRC -- ASSUME WE WILL HAVE TO USE SOME EXISTING DATA
4. Q-LIST IS INCOMPLETE AND LACKS CONSERVATISM [THIS COMMENT REFERS TO THE DESCRIPTION OF THE QA PROGRAM IN SECTION 8.6 OF SCP -- NOT THE PROGRAM AFTER IMPLEMENTATION OF NUREG 1318]

## GEOENGINEERING

### NRC CONCERNS

1. ESF TITLE I HAS NOT BEEN ACCEPTED BY THE NRC AND THE DAA SUBMITTED IN FEBRUARY 1989 IS NOT ADEQUATE [NOT ALL KEY REQUIREMENTS WERE CONSIDERED]
2. THE SCP HAS NOT DEMONSTRATED THE PROPOSED TEST PROGRAM IS COMPREHENSIVE AND WILL YIELD ADEQUATE RESULTS
3. APPROACH TAKEN TO INTEGRATE ESF AND REPOSITORY IS NOT ADEQUATE
4. PERFORMANCE CONFIRMATION PROGRAM IS NOT COMPREHENSIVE [PROGRAMS FOR SEALS AND WASTE PACKAGE ARE NOT ADEQUATE]

## WASTE PACKAGE

### NRC CONCERNS

1. DEFINITION OF "SUBSTANTIALLY COMPLETE CONTAINMENT" IS ACCEPTABLE; HOWEVER, RELATED TERMS [TECHNOLOGICAL LIMITATIONS AND UNCERTAINTIES] ARE NOT DEFINED
2. LINKAGE FROM UNCERTAINTIES TO TESTING PROGRAM STILL NOT EXPLAINED; [WOULD DIFFERENCES IN THE VALUES PLACED ON GOALS CHANGE THE TESTING PROGRAM?]
3. NRC IS NOT CONVINCED THAT THE TESTING PROGRAM WILL PROVIDE ADEQUATE INFORMATION TO SUPPORT LONG-TERM PREDICTIONS [TESTS ARE ONLY SCHEDULED TO RUN FOR 5 YEARS, RATHER THAN 30 YEARS]
4. LABORATORY TESTS MAY NOT BE SUFFICIENT TO ESTABLISH WASTE PACKAGE INTEGRITY - MAY NEED IN SITU TESTS WITH A PRELIMINARY WASTE PACKAGE

## GEOLOGY AND GEOPHYSICS

### NRC CONCERNS

1. INTEGRATION AMONG THE ALTERNATIVE CONCEPTUAL MODELS AND THE SURFACE-BASED INVESTIGATIONS WAS NOT ADEQUATE AND THE GEOPHYSICS PROGRAM IS NOT WELL-INTEGRATED
2. SOME GOALS APPEAR TO BE NON-CONSERVATIVE OR FAULTY
3. APPROACH TO OBTAINING SLIP RATES IS STILL UNCLEAR
4. AREA OF STUDY FOR VOLCANISM SHOULD BE EXPANDED INTO CALIFORNIA AND A LARGER REGION OF THE BASIN AND RANGE PROVINCE [ALLOWS WIDER SEARCH FOR ANALOGS]
5. THE 10,000-YEAR CUMULATIVE SLIP EARTHQUAKE IS NOT CONSERVATIVE
6. PROGRAM OF SURFACE-BASED TESTING AND DRIFTING APPEARS UNLIKELY TO PROVIDE SUFFICIENT INFORMATION TO CHARACTERIZE THE SITE

## NATURAL RESOURCES

### NRC CONCERNS

1. NOT ALL ALTERNATIVE CONCEPTUAL MODELS FOR NATURAL RESOURCES WERE IDENTIFIED
2. DRILLING PROGRAM FOR NATURAL RESOURCES DOES NOT APPEAR TO BE INTEGRATED WITH GEOPHYSICS PROGRAM
3. NATURAL RESOURCE PROGRAM APPEARS TO BE BIASED AGAINST STRUCTURAL CONTROL OF MINERALIZATION AND TOO HEAVILY FOCUSED ON OCCURRENCES IN TUFFS

## HYDROLOGY

### NRC CONCERNS

1. NRC'S GENERIC TECHNICAL POSITION (GTP) FOR PRE-WASTE EMPLACEMENT GROUND-WATER TRAVEL TIME IS BEING WITHDRAWN [SCP TEXT APPEARS TO RELY TOO HEAVILY ON OUTDATED GTP]
2. QUESTIONED IF THE APPROACH TAKEN FOR CALCULATING GWTT IS CONSISTENT WITH THE WAY THEY ARE RE-INTERPRETING THE REGULATION [ALTHOUGH REGULATION IS "PRE-WASTE EMPLACEMENT" -- MUST CONSIDER FULL RANGE OF "ANTICIPATED PROCESSES AND EVENTS"]
3. NOT ALL ASSUMPTIONS FOR PRE-WASTE EMPLACEMENT GROUND-WATER TRAVEL TIME HAVE BEEN IDENTIFIED
4. PLANS TO CHARACTERIZE THE CALICO HILLS ARE INADEQUATE
5. SATURATED ZONE PROGRAM IS INADEQUATE -- ADDITIONAL MULTIPLE WELL TESTS MAY BE NECESSARY

## **GEOCHEMISTRY**

### **NRC CONCERNS**

- 1. GEOCHEMISTRY PROGRAM SHOULD BE EXPANDED TO INCLUDE PROCESSES FOR CONCENTRATING RADIONUCLIDES ALONG FRACTURE SURFACES, AND SUBSEQUENT TRANSPORT**
- 2. CURRENT APPROACH RELIES ON LABORATORY STUDIES OF RADIONUCLIDE RETARDATION ( $K_d$ s); THIS APPROACH IS NOT SUBSTANTIATED FOR THE FULL RANGE OF SATURATED/UNSATURATED CONDITIONS AT YUCCA MOUNTAIN**

## PRELIMINARY OVERALL OBSERVATIONS ABOUT NRC CONCERNS

1. THE TECHNICAL CONCERNS RAISED BY NRC SPEAKERS (EXCEPT GEOENGINEERING) SUGGEST THAT NO NRC OBJECTIONS ARE LIKELY IN THEIR SCA; MOST STAFF APPEAR TO BE ANXIOUS TO SEE SITE CHARACTERIZATION UNDERWAY
  
2. GEOENGINEERING: IF AN OBJECTION IS PROPOSED, IT WILL COME FROM AN ACCUMULATION OF INCONSISTENCIES IN ESF TITLE I DESIGN. THEY MAY TAKE THE POSITION THAT THE INCONSISTENCIES ARE SYMPTOMATIC OF THE LACK OF AN EFFECTIVE DOE DESIGN CONTROL PROCESS.

NRC'S CONCERNS COULD BE AMELIORATED BY:

- A. ACQUIRING THEIR APPROVAL OF OUR QA PROGRAM
- B. REACHING CONSENSUS ON THE APPLICABLE PORTIONS OF THE REGULATIONS  
[EXPANSION OF DAA??]
- C. DEMONSTRATING AN EFFECTIVE DESIGN CONTROL PROCESS EXISTS FOR ESF TITLE II DESIGN

**INTERACTIONS WITH  
THE NUCLEAR WASTE TECHNICAL REVIEW BOARD  
(NWTRB)**

**BY  
MAXWELL BLANCHARD  
DIRECTOR, YMP REGULATORY & SITE EVALUATION DIVISION**

NWTRB

NWTRB: THE NUCLEAR WASTE TECHNICAL REVIEW BOARD

- o ESTABLISHED BY THE NUCLEAR WASTE POLICY AMENDMENTS ACT OF 1987
  - AN INDEPENDENT BOARD WITHIN THE EXECUTIVE BRANCH
  - CANDIDATES NOMINATED BY NATIONAL ACADEMY OF SCIENCES
  - ELEVEN MEMBERS APPOINTED BY THE PRESIDENT
  
- o PURPOSE: EVALUATE THE TECHNICAL AND SCIENTIFIC VALIDITY OF ACTIVITIES UNDERTAKEN BY THE SECRETARY (DOE) INCLUDING
  - SITE CHARACTERIZATION ACTIVITIES
  - ACTIVITIES RELATED TO THE PACKAGING OR TRANSPORTATION OF HIGH LEVEL WASTE OR SPENT FUEL

NWTRB

**INVESTIGATORY POWERS, SUPPORT SERVICES, REPORTS**

- o NWTRB MAY HOLD HEARINGS, TAKE TESTIMONY, AND RECEIVE EVIDENCE AS THE BOARD CONSIDERS APPROPRIATE
- o DOE TO PROVIDE INFORMATION NECESSARY TO RESPOND TO ANY BOARD REQUEST
  - EXPLICITLY INCLUDES DRAFTS AND DOCUMENTATION OF WORK IN PROGRESS
- o NWTRB MAY PROCURE TEMPORARY SERVICES OF EXPERTS AND CONSULTANTS
- o NWTRB TO REPORT ITS FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS NO LESS THAN TWO TIMES PER YEAR TO CONGRESS AND THE SECRETARY (DOE)
- o NWTRB SHALL CEASE TO EXIST WITHIN ONE YEAR OF COMMENCING WASTE EMPLACEMENT

NWTRB

LISTING OF MEMBERS AND BACKGROUND

DR. DON DEERE, CHAIRMAN	ROCK MECHANICS
DR. CLARENCE ALLEN	CIVIL ENGINEERING AND GEOLOGY
DR. JOHN CLANTON	BIOLOGY
DR. MELVIN CARTER	CIVIL ENGINEERING/HEALTH PHYSICS
DR. DONALD LANGMUIR	GEOCHEMISTRY
DR. WARNER NORTH	DECISION ANALYSIS
DR. DENNIS PRICE	INDUSTRIAL ENGINEERING AND OPERATIONS
DR. ELLIS VERINK	METALLURGY
DR. EDWARD CORDING	CONSULTANT, MINING ENGINEERING
DR. WILLIAM BARNARD	OTA DESIGNEE

**NWTRB - DOE MEETINGS**

1. NWTRB - DOE/HQ MARCH 7 & 8, 1989
  - INTRODUCTION TO OCRWM PROGRAM
  
2. NWTRB - DOE/YMP APRIL 11 & 12, 1989
  - YMP RESPONSE TO TWO QUESTIONS  
RAISED IN MARCH ABOUT SITE  
CHARACTERIZATION
  
3. NWTRB - DOE/HQ AND DOE/YMP MAY 16 & 17, 1989
  - PERFORMANCE ASSESSMENT

**MARCH NWTRB/DOE-HQ**

**MAJOR POINTS DISCUSSED:**

- o PROGRAM HISTORY
- o REPOSITORY SYSTEM
- o SITE CHARACTERIZATION
- o ENGINEERED SYSTEMS

**RESULTS: NWTRB ASKS 2 QUESTIONS OF DOE-YMP IN APRIL CONCERNING  
THE EXTENT AND METHOD OF ESF CONSTRUCTION**

APRIL 11 & 12 MEETING

RESULTS

- o AGREED THAT PERIMETER DRIFT IS PREMATURE
- o ADDITIONAL EVALUATION OF ESF CONSTRUCTION METHOD: CAN RAISE BORING BE A BENEFIT TO PROGRAM?
- o ADDITIONAL EVALUATION OF AN EXTENDED DRIFTING PROGRAM:  
EXTEND THE DRIFTING TO THE GHOST DANCE FAULT TO THE WEST  
AND TO THE SOUTH
- o YMP TO PROVIDE THE FOLLOWING TO NWTRB
  1. DESIGN ACCEPTABILITY ANALYSIS
  2. ANNOTATED SCP 8.4
  3. SCOTT & BONK MAP
  4. STUDY PLAN ASSESSMENT
  5. NRC COMMENTS ON SCP/CD & DOE RESPONSES
  6. SURFACE-BASED INVESTIGATION PLAN & SITE ATLAS
  7. SCP TO DR. CORDING

## STATUS OF EVALUATION OF ESF CONSTRUCTION METHOD

1. **GOLDER & ASSOCIATES TO CONDUCT A STUDY**
  - **SCOPE:** EXAMINE ESF SHAFT CONSTRUCTION OPTIONS IDENTIFIED BY THE NWTRB. FOCUS ON TESTING NEEDS, QUALITY OF TESTING DATA, SAFETY, SCHEDULE, AND COST
  - **PLAN:** TECHNICAL REPORT DUE JUNE 21 TO INCLUDE EVALUATION OF OPTIONS USING THE FOLLOWING OBJECTIVES:
    - o APPLICABLE 10 CFR 60 REQUIREMENTS
    - o TESTING PROGRAM NEEDS
    - o POTENTIAL FOR RE-LOCATING, ALTERING, POSTPONING, OR ELIMINATING TESTS
    - o POTENTIAL IMPACTS TO ISOLATION AND TEST RESULTS
    - o OCCUPATIONAL SAFETY
    - o SCHEDULE
  - **STATUS:**
    - o REVIEW MEETING WEEK OF JUNE 5
    - o CONTRACTOR SUBMITS FINAL REPORT JUNE 21

## STATUS OF EVALUATION OF EXTENDED DRIFTING

### 2. WESTON TO CONDUCT A STUDY

- SCOPE: FOCUS ON THE SUGGESTION TO "EXTEND DRIFTING".  
CONSIDER ADEQUACY OF THE TESTING PROGRAM,  
POTENTIAL IMPACTS ON ISOLATION, AND POTENTIAL  
IMPACTS ON REPOSITORY DESIGN
  
- PLAN: TECHNICAL REPORT DUE JUNE 21 TO INCLUDE:
  - o ASSUMPTIONS AND CRITERIA
  - o HISTORICAL BACKGROUND
  - o RATIONALE FOR CURRENT DRIFTING PLANS
  - o TECHNICAL EVALUATION OF THE NWTRB SUGGESTION
  - o COST/SCHEDULE AND PROGRAMMATIC IMPACTS
  - o RECOMMENDATIONS
  
- STATUS:
  - o REVIEW OF DRAFT REPORT WEEK OF JUNE 5
  - o CONTRACTOR SUBMITS FINAL REPORT WEEK OF  
JUNE 19

# AGENDA

## NWTRB PERFORMANCE ASSESSMENT BRIEFING

### MAY 16-17, 1989

#### MAY 16

#### OVERVIEW OF PERFORMANCE ASSESSMENT PROGRAM

10:00	INTRODUCTION AND WELCOME	DOE & NWTRB
10:30	OVERVIEW OF PERFORMANCE ASSESSMENT	ALEXANDER
11:00	FLOWDOWN OF REGULATORY REQUIREMENTS TO PERFORMANCE ASSESSMENT PROGRAM	RICKERTSEN
11:30	TECHNICAL INTEGRATION OF PERFORMANCE ASSESSMENT PROGRAM	GNIRK
12:00	LUNCH	

#### CURRENT STATUS AND DATA NEEDS FOR MAJOR PERFORMANCE ASSESSMENT AREAS

1:00	PERFORMANCE OF NATURAL BARRIERS	HOXIE
1:40	ENGINEERED BARRIER SYSTEM PERFORMANCE	VAN LUIK
2:20	BREAK	
2:30	POSTCLOSURE TOTAL SYSTEM PERFORMANCE ASSESSMENT	BINGHAM
3:10	PRECLOSURE SAFETY ASSESSMENT	MICHLEWICZ
3:40	REVIEW OF TOMORROW'S AGENDA & DISCUSSION	ALEXANDER
4:00	DISCUSSION PERIOD	

# AGENDA

(CONTINUED)

**MAY 17**

## INVESTIGATIVE APPROACH IN SUPPORT OF PERFORMANCE ASSESSMENT

<b>8:30</b>	<b>MODEL VALIDATION STRATEGY</b>	<b>VOSS</b>
<b>9:00</b>	<b>LINKAGE FROM PERFORMANCE ASSESSMENT TO THE SITE PROGRAM</b>	<b>BLANCHARD</b>
<b>10:00</b>	<b>BREAK</b>	

## RECENT APPLICATIONS OF PERFORMANCE ASSESSMENTS

<b>10:10</b>	<b>PERFORMANCE ASSESSMENT IN SUPPORT OF THE SITE CHARACTERIZATION PLAN</b>	<b>YOUNKER</b>
<b>10:40</b>	<b>PERFORMANCE ASSESSMENT OF YUCCA MOUNTAIN IN SUPPORT OF THE COMPARITIVE SITE ANALYSIS</b>	<b>GNIRK</b>
<b>11:20</b>	<b>POTENTIAL IMPACTS OF EXPLORATORY SHAFT FACILITY ON WASTE ISOLATION</b>	<b>BINGHAM</b>
<b>12:00</b>	<b>LUNCH</b>	

## DISCUSSION OF WASTE PACKAGE MODEL DEVELOPMENT

<b>1:00</b>	<b>MODELS OF WASTE PACKAGE BEHAVIOR IN A REPOSITORY ENVIRONMENT</b>	<b>PIGFORD</b>
<b>1:50</b>	<b>CALCULATIONAL MODEL FOR WASTE PACKAGE RELEASES</b>	<b>APTED</b>
<b>2:30</b>	<b>SUMMARY</b>	<b>ALEXANDER</b>

## NWTRB PERFORMANCE ASSESSMENT BRIEFING OUTCOME

- o FAVORABLE RESPONSE BY NWTRB
  - QUALITY AND CONTENT
- o NWTRB THEMES
  - TOP-DOWN PA MANAGEMENT
    - DO ONLY WHAT IS REQUIRED
    - RESEARCH FOR RESEARCH SAKE NOT APPROPRIATE
  - SENSE OF PRIORITY IS IMPORTANT
    - HOW WILL THIS BE SYNTHESIZED INTO TOP MANAGEMENT?
  - NWTRB CAN ASSIST IN PRIORITIZATION DECISION PROCESS

## FUTURE MEETINGS

JUNE 26-28

1. ONE DAY MEETING WITH STATE OF NEVADA
2. INTRODUCTION TO SITE CHARACTERIZATION AND YUCCA MOUNTAIN PROJECT
3. DOE-YMP SITE VISIT

DRAFT AGENDA

JUNE 27, 1989: NWIRE MEETING  
OVERVIEW OF YUCCA MOUNTAIN SITE

8:30	Introduction & welcome	Gertz Isaacs Saltzman Stein Deere
8:45	Overview of briefing & field trip	Blanchard

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Each of the following presentations will contain:

- a) description of major site features
  - b) a discussion of why these features are considered important to waste isolation
- 

9:00	Geologic Description of Yucca Mountain Site -tectonic setting -rock characteristic -3-D structure -mineralogy/petrology/geochemistry -natural resources	Dobson
10:00	Break	
10:15	Volcanology & volcanic hazards	Crowe
10:45	Seismicity & seismic hazard analyses	King
11:30	Lunch	
12:45	Hydrologic description of the site -saturated zone -unsaturated zone -paleohydrology -paleo- and future climate	Wilson
2:30	Break	
2:45	Overview of plans for site characterization -review planned studies and activities with focus on surface-based program -prerequisites for initiating field activities	Yunker
3:45	Summary and discussion: plans for tomorrow's field trip	Blanchard
4:30	Adjourn	

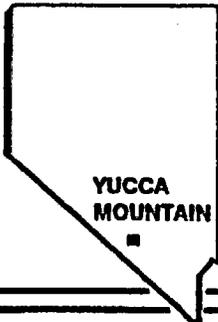
NWTRB FIELD TRIP  
Leader: Uel Clanton  
YMP Site Investigations Branch Chief

Wednesday, June 28, 1989

Topics to be covered in presentations on field trip	Proposed speakers
SMF/Cores: general mineralogy-petrology variations in tuffs (especially Topopah Spring and Calico Hills), fractures studies on cores, SMF handling procedures	Broxton, LANL Davidson, SAIC
General geology: discussion of outcrops and stratigraphy, volcanology, structural geology, fault locations and ages (including Ghost Dance fault), geomorphology, neotectonics, Mid-way Valley hydrogenic deposits, paleoclimatology	Fox, USGS Whitney, USGS Shepard, SNL Stuckless, USGS Vaniman, LANL Crowe, LANL
ESF site: flood potential, nearby faults (Ghost Dance), drift locations	Barton, YMP Robson, YMP Tillerson, SNL
Unsaturated zone testing: dry-drilling, instrumentation, neutron holes, infiltration experiments	Wilson, USGS Flint, USGS + staff as needed
Saturated zone testing: Water-table holes, stability of water table, paleohydrology	Wilson, USGS + staff as needed

U.S. DEPARTMENT OF ENERGY

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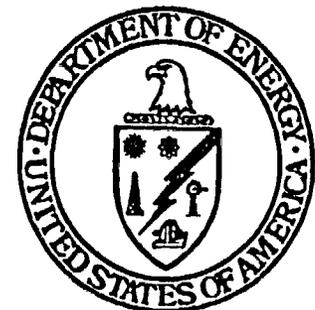


# YUCCA MOUNTAIN PROJECT

## SUMMARY OF PRELIMINARY PROTOTYPE DRILLING/CORING PROGRAM

**MAY 1989**

UNITED STATES DEPARTMENT OF ENERGY  
NEVADA OPERATIONS OFFICE/YUCCA MOUNTAIN PROJECT OFFICE



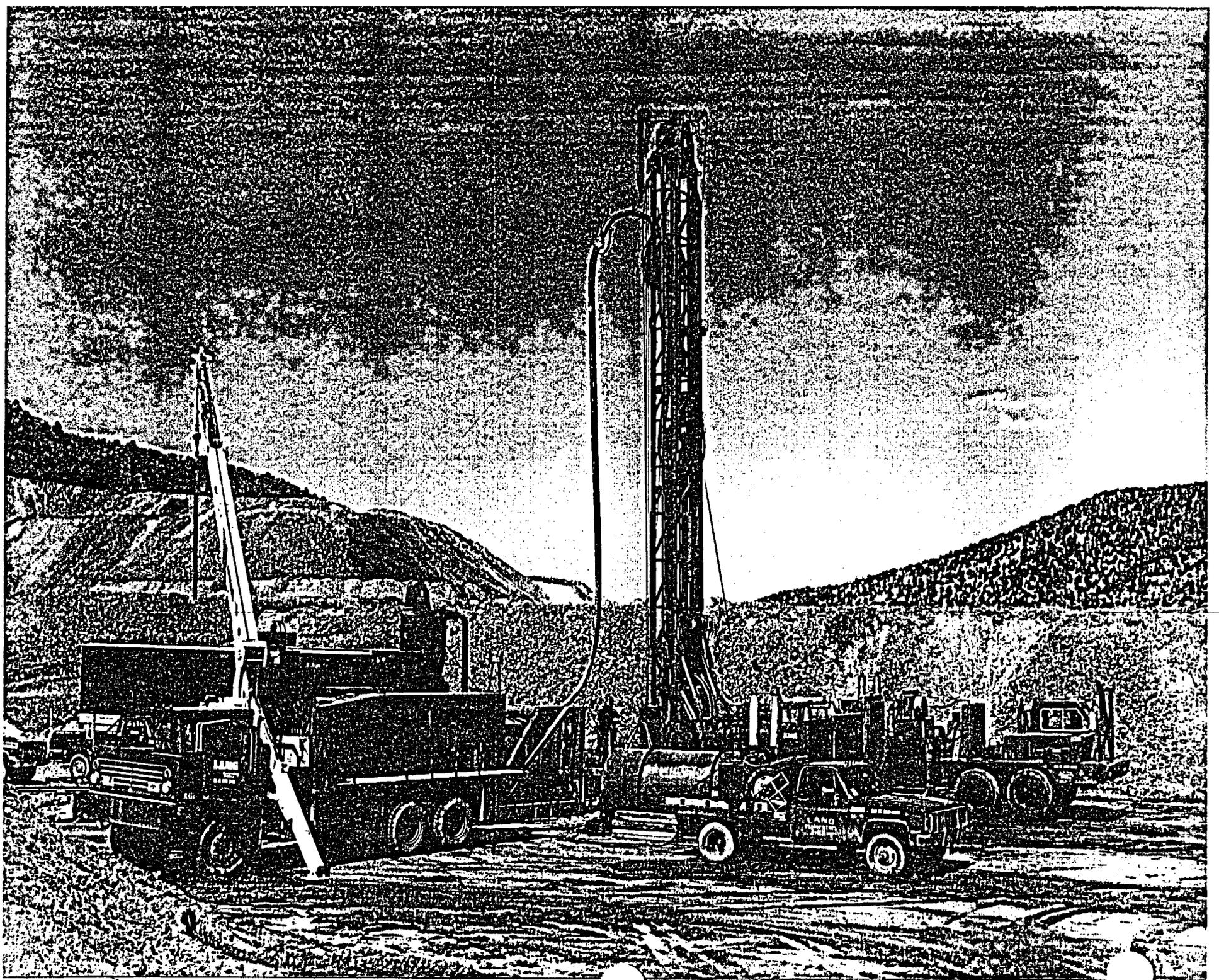
**PURPOSE OF THE YUCCA MOUNTAIN PROJECT'S  
PROTOTYPE DRILLING/CORING PROGRAM  
IS TO TEST THE EQUIPMENT, METHODS AND  
PROCEDURES THAT WILL EVENTUALLY BE USED  
DURING SITE CHARACTERIZATION ACTIVITIES**

---

- **REQUIREMENTS FOR DRY DRILLING AND DRY CORING DURING SITE CHARACTERIZATION ARE UNIQUE**
  - **IN NORMAL MINING INDUSTRY DRY DRILLING, THE ROCK IS GROUND UP AND CUTTINGS ARE BLOWN TO THE SURFACE**
- **HOWEVER, THE PROJECT NEEDS TO BE ABLE TO RECOVER INTACT CORE SAMPLES FROM DRILL HOLES FOR FURTHER STUDY**
  - **ANY WATER USED DURING THE SITE CHARACTERIZATION DRILLING PROCESS COULD AFFECT HYDROLOGIC EXPERIMENTS AND ALTER THE ROCK'S NATURAL STATE**

# **PROTOTYPE DRY DRILLING AND DRY CORING IS OCCURRING IN TWO PHASES: FIRST IN UTAH AND SECOND AT THE NEVADA TEST SITE (NTS)**

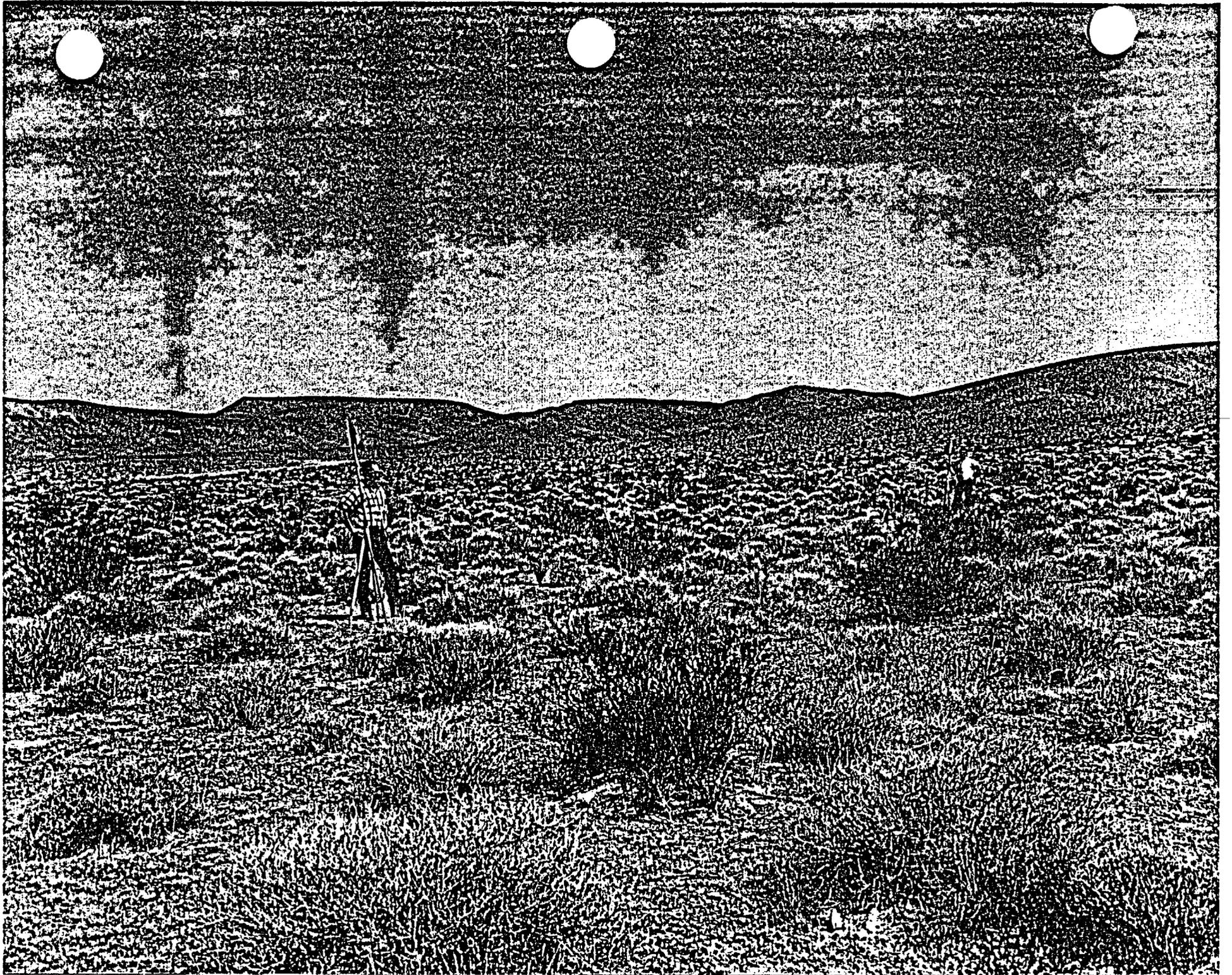
- **YUCCA MOUNTAIN PROJECT BEGAN PHASE 1 ACTIVITIES ON  
MAY 15, 1989 IN UTAH**
- **NO SITE CHARACTERIZATION DATA WILL BE COLLECTED DURING  
PROTOTYPE DRILLING IN EITHER UTAH OR NEVADA**
- **PHASE 1 WILL BE PERFORMED BY THE MANUFACTURER OF THE  
EQUIPMENT, LANG EXPLORATORY DRILLING, NEAR TOOELE, UTAH**
  - **ROCK TYPE AT THIS LOCATION IS SILICIFIED LIMESTONE**
  - **PHASE 1 INCLUDES APPROXIMATELY 20 DAYS OF DRILLING SEVERAL  
HUNDRED FEET DEEP TO TEST THE EQUIPMENT**
- **STATE OF NEVADA AND NRC HAVE BEEN INVITED TO OBSERVE ALL  
TESTS**



SITE OF PHASE 1 PROTOTYPE DRY DRILLING AND DRY MORTARING ACTIVITIES NEAR SALT LAKE CITY, UTAH.

**PHASE 2 WILL BE CONDUCTED AT THE NEVADA  
TEST SITE (NTS), APPROXIMATELY 5 MILES  
SOUTH-SOUTHEAST OF PROPOSED  
YUCCA MOUNTAIN REPOSITORY**

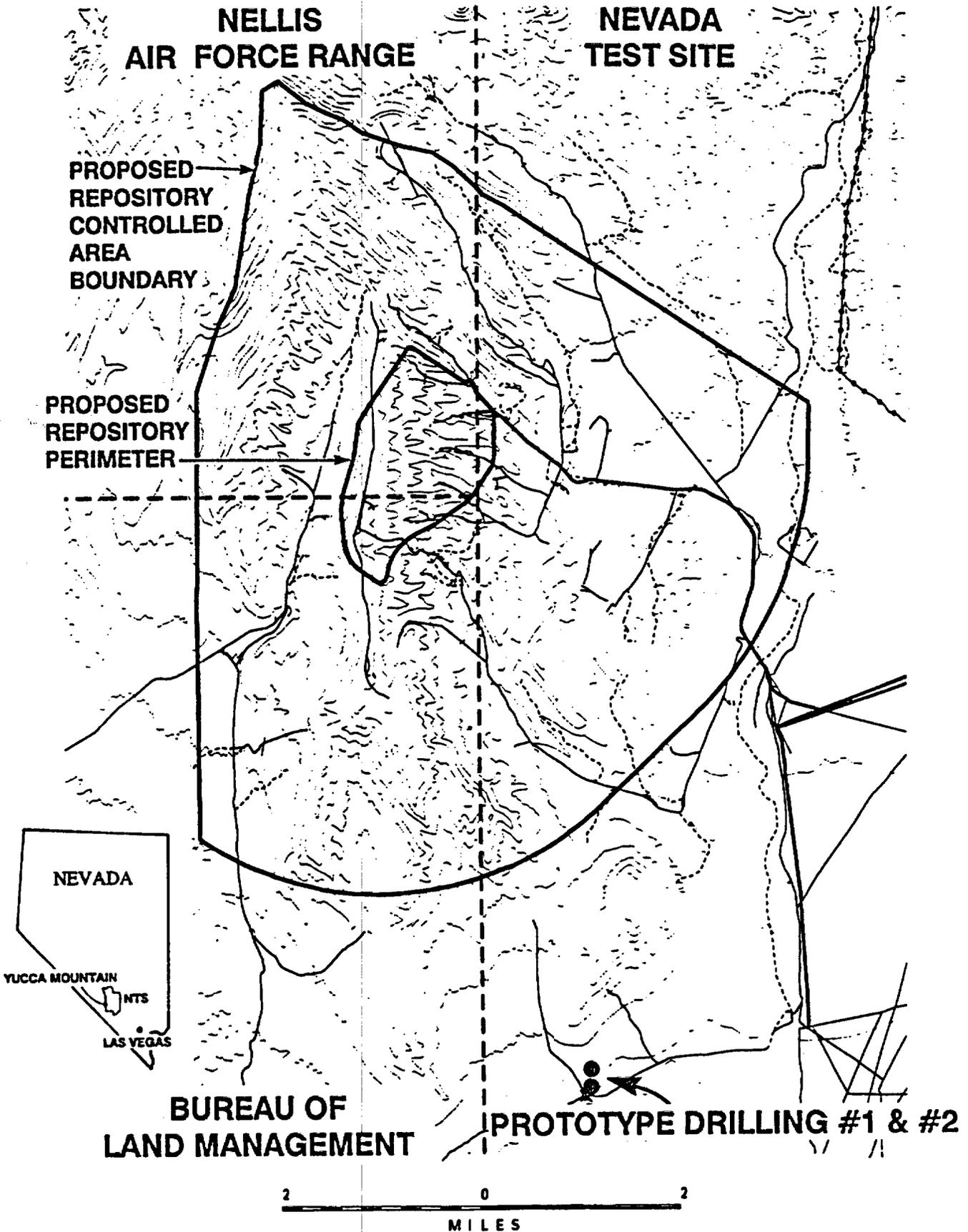
- **STARTING DATE FOR PHASE 2 IS APPROXIMATELY MID-JUNE,  
PENDING STATE APPROVAL OF AN AMENDED NTS AIR QUALITY  
PERMIT**
  
- **PURPOSE IS TO CONTINUE EQUIPMENT TESTING IN VOLCANIC  
TUFF; FINALIZE QUALITY ASSURANCE, SAMPLE MANAGEMENT  
AND DRILLING PROCEDURES, AND TRAIN PERSONNEL**
  
- **TWO HOLES WILL BE DRILLED/CORED TO APPROXIMATELY  
1100 FEET DEEP WITH DIAMETERS OF 8-INCH AND 12-INCH  
RESPECTIVELY**
  - **THREE CORING METHODS WILL BE USED AND THEN EVALUATED  
AND COMPARED**
  - **DRILLING IS SCHEDULED FOR APPROXIMATELY 60 DAYS**



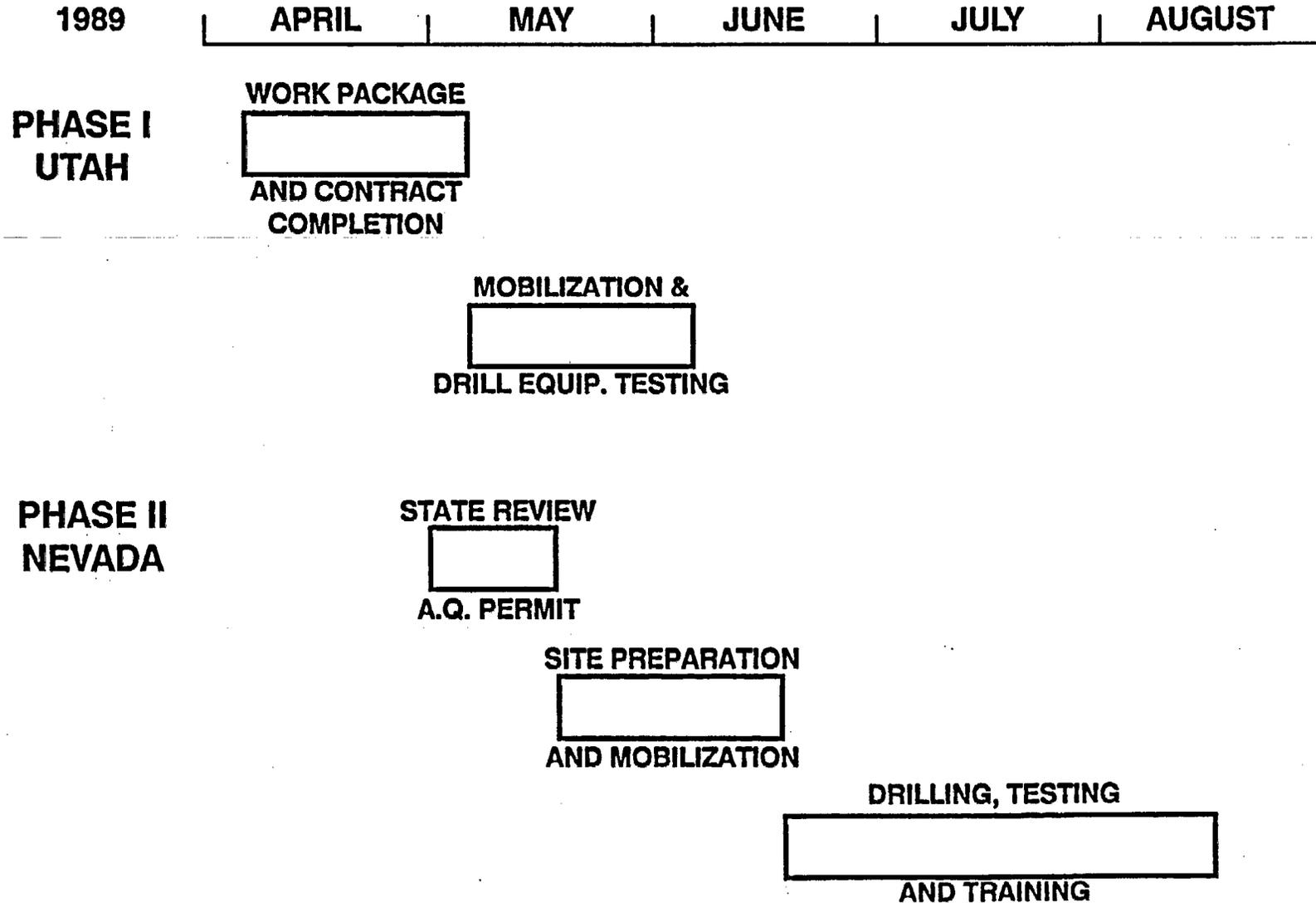
PLANNED SITE OF PHASE 2 PROTOTYPE DRY DRILLING AND DRY CORING ACTIVITIES ON THE NEVADA TEST SITE (WITH YUCCA MOUNTAIN IN BACKGROUND).

# YUCCA MOUNTAIN PROJECT PROPOSED PROTOTYPE BOREHOLES

DRILAC09P.CPG/5-22-89



# PROTOTYPE BOREHOLES



# **STATUS OF AIR QUALITY OPERATING PERMIT**

- **DOE BELIEVED PROTOTYPE TESTING COVERED BY EXISTING NEVADA TEST SITE (NTS) PERMIT**
  - **ADDITIONAL YUCCA MOUNTAIN PERMIT WAS NOT BELIEVED TO BE REQUIRED FOR PROTOTYPE ACTIVITIES AT NTS**
  
- **DUE TO AMBIGUITY IN NTS PERMIT, DOE AND STATE AGREED ON MAY 4, 1989 TO MODIFY THE NTS PERMIT TO ADDRESS PROTOTYPE TESTING**
  - **PROPOSED MODIFICATION SENT TO STATE ON MAY 5, 1989**
  
- **STATE REQUESTED ADDITIONAL INFORMATION ON MAY 12, 1989, DOE RESPONDED ON MAY 15, 1989**
  
- **DOE NOW AWAITING STATE RESPONSE**

CARL — F4 J.



## United States Department of the Interior

GEOLOGICAL SURVEY  
BOX 25046 M.S.  
DENVER FEDERAL CENTER  
DENVER, COLORADO 80225



IN REPLY REFER TO:

June 1, 1989

WBS: 1.2.9.1  
QA: QA

Carl P. Gertz  
Yucca Mountain Project Office  
U.S. Department of Energy  
P.O. Box 98518  
Las Vegas, NV 89193-8518

Dear Carl:

An eastward-dipping normal fault has been interpreted to occur in Coyote Wash on the basis of electrical resistivity contrasts modeled in two sections parallel to the wash (Smith and Ross, 1982, plates II and V). On the map of plate V, the fault is shown as a solid line across the wash, and it is dashed at both ends and queried at the northern end (dashes indicate considerable uncertainty). On the sections of plate II, the fault is shown as a dashed line.

The possible occurrence of the fault has been inferred solely on the basis of modeling of contrasts in electrical resistivity. However, these contrasts could equally be caused by other contrasts in material properties not related to faultings such as differences in the degree of fracturing, moisture content, and mineralogy. Furthermore, two published geologic maps that are based on detailed field mapping show no surficial evidence of faulting at this location (Lipman and McKay, 1965, and Scott and Bonk, 1984)

The Yucca Mountain Project currently is conducting a Technical Assessment Review on geological and geophysical evidence pertaining to the structure geology of the exploratory shaft location. The purposes of this review (which is being conducted under quality assurance procedures) are to (1) review the data and interpretations on which the Smith and Ross (1982) report is based; (2) review the results of other geologic and geophysical interpretations that relate to the possibility of faulting in the vicinity of the exploratory shafts; and (3) determine what interpretations are allowed by the evidence. Presently, no definitive statement can be made on the occurrence of a fault at Coyote Wash. However, once the review is completed, on the basis of the weight of evidence, a collective judgment will be made regarding the structural geology in this area.

Sincerely,

*Larry R. Hayes*

Larry R. Hayes  
Technical Project Officer  
Yucca Mountain Project  
U.S. Geological Survey

cc: W. Wilson, USGS/Denver  
R. Raup, USGS/Denver  
D. Jorgensen, USGS/Denver  
YMP-USGS Local Records Center

LRH/WW/klh  
(058984)

Bob Miller  
Acting Governor

STATE OF NEVADA

ROBERT R. LOUX  
Executive Director



**AGENCY FOR NUCLEAR PROJECTS  
NUCLEAR WASTE PROJECT OFFICE**

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

May 30, 1989

Carl Gertz  
Project Manager  
Yucca Mountain Project Office  
United States Department of Energy  
Post Office Box 98518  
Las Vegas, Nevada 89193-8518

Dear Mr. Gertz:

RE: STATE OF NEVADA PRELIMINARY COMMENTS ON THE SITE CHARACTERIZATION PLAN FOR THE YUCCA MOUNTAIN CANDIDATE HIGH-LEVEL NUCLEAR WASTE REPOSITORY SITE

The Nevada Agency for Nuclear Projects, Nuclear Waste Project Office, has completed its preliminary review of the exploratory shaft facility (ESF) components of the U.S. Department of Energy Site Characterization Plan for the Yucca Mountain candidate nuclear waste repository site. This preliminary review included portions of the DOE's Technical Assessment Review Design Acceptability Analysis and Exploratory Shaft Location Documentation Report, as well as numerous relevant references.

In accord with the DOE's request (FR / Vol. 53 No.251 / Dec. 20, 1988 / Pa. 53057, as modified on March 20, 1989) these preliminary comments focus on issues related to the start of the exploratory shaft facility, and are being submitted within the DOE's announced public review and comment period for the Site Characterization Plan (SCP). As the DOE has been notified, the balance of the State of Nevada's technical comments on the SCP will be forwarded to DOE not later than September 1, 1989.

The attached Preliminary Comments on the ESF describe Nevada's critical concerns over both the selected location of the ESF at Yucca Mountain and some aspects of the ESF Design at its current level of development. The summary conclusion that arises from the attached comments and concerns is that the DOE should not proceed with the initiation of site characterization and ESF

construction until certain fundamental ESF site location and design issues are resolved. Without such advance reconsideration and resolution, the potential consequences are twofold; first, that DOE's activities associated with ESF construction will preclude the future collection of data critical to a determination of Yucca Mountain site suitability, and second, that DOE's ESF construction activities will compromise the capability of the site to safely isolate waste, should it be developed as a repository. ✓

The ESF location at Coyote Wash, was initially selected by DOE in mid-1982, with the selection process documented in a Sandia Report (SAND84-1003). The selection of this location was recently reviewed by the DOE, in December 1988, with that analysis, the Exploratory Shaft Location Documentation Report, confirming the earlier location decision. Nevada's review has revealed that neither the original Sandia Report nor the recent review by DOE acknowledges a 1982 United States Geological Survey report (USGS Open File Report 82-182) which contains strong evidence of a fault intersecting the selected ESF site, possibly between the two proposed exploratory shafts. The Location Documentation Report claims to have reviewed certain cited post-1982 reports of geophysical data relevant to the selected ESF site, with the conclusion that no adverse subsurface structures appear to be present at the selected Coyote Wash ESF site. However, the resistivity survey data documented in the 1982 U.S.G.S. report, and later summarized in a 1984 U.S.G.S. report were not included in the DOE's recent review even though the work was performed for the Yucca Mountain Project. ✓

The known existence of a fault at the Coyote Wash ESF site would result in the disqualification of this proposed ESF site according to the criteria established in the 1982 Sandia ESF site screening report for setback from adverse subsurface geologic structures. Furthermore, placing the ESF in a fault-disturbed area casts into great question the representativeness of any site characterization data collected from the ESF. It also renders the ESF vulnerable to potential severe flooding from surface water infiltration along a preferred pathway, or from intersection of a perched groundwater zone during shaft or drift construction. ✓

Aside from concerns about flooding of the ESF related to the probable fault as described above, the location of the two shaft openings at the proposed ESF in Coyote Wash is such that there is significant concern over potential surface water flooding of the ESF surface facility, the shafts, and underground drifts. The SCP acknowledges in numerous disclaimers that flood level predictions regarding washes in and around the Yucca Mountain area are speculative at best, and that there is essentially no site specific flood data for Coyote Wash. In addition, as Nevada has commented to DOE previously, the effect of proposed ESF surface modifications and structures on flood heights and velocities has ✓

not been adequately analyzed, primarily due to a lack of site specific information. The consequences of flooding the ESF as a result of the lack of adequate shaft collar elevation and adequate surface flood protection structures, aside from the obvious risks to personnel, are such that the ESF may be rendered useless for collection of necessary in-situ site characterization data, and the abandoned damaged ESF itself may adversely impact the site's waste isolation capabilities.

From the design standpoint, the SCP and associated documents do not provide plans for sealing, or otherwise isolating from the remainder of the repository block, a failed shaft in the ESF, whether resulting from flooding or other causes, in order to assure that it will not adversely impact the waste isolation performance of a repository. This matter stands as one of the many unresolved design problems, which also include inadequate evaluation of environmental impacts of construction of the ESF.

An additional design issue involves the placement of planned boreholes associated with the ESF. Because of the known lack of quality borehole data at the proposed ESF site for use in shaft design, DOE has planned to drill at least two multipurpose boreholes on the ESF pad at Coyote Wash. The data from these boreholes will be necessary for further shaft design, yet if these holes are drilled as planned, and the DOE's criteria for distance to be maintained between boreholes and shafts at the ESF are honored, there is insufficient space to complete both activities. If some degree of borehole deviation during drilling is assumed (a realistic assumption), not only will the spacing criteria be violated, but there is a possibility that the shafts will intersect the previously drilled boreholes. With reference to the possibility of a proposed third multipurpose borehole, implementing the plan would result in the borehole intersecting a planned ESF drift at the underground test horizon. Further, the surface location of this hole would coincide with the planned location of the hoist house for the No. 2 exploratory shaft. In sum, the design and layout of the ESF cannot accommodate all the planned excavations and proposed construction while continuing to comply with the spacing criteria established by DOE for the ESF underground facility. The spacing criteria have their bases in assuring safety and preserving the ability to collect needed site characterization data that is representative of the site's undisturbed geohydrologic conditions.

The above comments constitute a set of fundamental concerns regarding the DOE's plans for developing and constructing an exploratory shaft facility at Yucca Mountain. Accompanying the attached State of Nevada Preliminary Comments are three letters in which we have previously detailed for DOE a number of the same concerns which are discussed in this letter and attached comments. It is Nevada's position that, without substantial resolution of these matters, it is both unsafe and imprudent to initiate site

characterization and ESF activities at the Yucca Mountain site.

If you have questions or comments regarding our concerns stated in this letter and the accompanying preliminary comment document please do not hesitate to contact me.

Sincerely,

Robert R. Loux  
Executive Director

RRL:cs  
attachment

BOB MILLER  
Acting Governor

STATE OF NEVADA

ROBERT R. LOUX  
Executive Director



**AGENCY FOR NUCLEAR PROJECTS  
NUCLEAR WASTE PROJECT OFFICE**

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

FOR IMMEDIATE RELEASE

May 31, 1989

Contact:  
Robert R. Loux  
Executive Director  
Nuclear Waste Project Office  
(702) 885-3744

The State of Nevada has strongly warned the Department of Energy to reevaluate its plan to sink two exploratory shafts at Yucca Mountain because an earthquake fault intersecting the shaft site could render it useless for further studies and unsafe for storing nuclear waste.

In preliminary comments released today, the State Nuclear Waste Project Office revealed that the DOE ignored one of its own reports solicited from the United States Geological Survey which indicates a fault intersects the selected exploratory shaft facility (ESF) location.

(more)

NWPO/2-2-2

As part of its scheme to determine whether Yucca Mountain can safely isolate deadly, high-level nuclear waste for 10,000 years, the DOE plans to sink two 12-foot wide, 1,050-foot deep shafts about 90 miles northwest of Las Vegas.

Besides possibly compromising Yucca Mountain's ability to safely store nuclear waste, the State said that unless fundamental design and location problems for the ESF are resolved, drilling could discredit vital information that must be collected to determine Yucca Mountain's suitability.

The State's preliminary comments came in response to the DOE's site characterization plan, an unwieldy, 6,300-page document which outlines the DOE's study of Yucca Mountain as the nation's first nuclear waste dump. Final comments are scheduled for release in late summer.

Bob Loux, executive director of the State Nuclear Waste Project Office, said in a letter to the DOE that if drilling on a known earthquake fault proceeds, it will likely encounter perched water that could severely flood the shafts, taint the ESF and cast great doubts on the entire project.

He further asserted that based on DOE's own criteria for safety and data preservation, the ESF site cannot accommodate the numerous additional boreholes the DOE plans to drill near the shafts.

(more)

NWPO/3-3-3

Loux said that "without substantial resolution of these matters, it is both unsafe and imprudent to proceed" with site characterization and the ESF. ✓

"I am very disappointed by the fact that the DOE has once again ignored its own scientists in the critical stages of the decision-making process," said Governor Miller. Ⓟ

"The Secretary assured us at our May 22nd meeting that this would be a scientific and technical process. I have asked that Secretary Watkins personally review and reconsider this decision.

"This would be the third instance in the past two years of the DOE ignoring its own scientists and contractors to satisfy a timetable at the expense of scientific data. ✓

"If Secretary Watkins lets this decision stand, it would seriously undermine the credibility of his stated desire to change a repository program so it is based on scientific facts, not politics."

The two other instances the Governor referred to were the DOE disregarding a study of one of its own scientists, Jerry Szymanski, who suggested the site might easily be disqualified on scientific grounds, and a "disaster" warning issued by 16 USGS hydrologists. In Aug. 5, 1987, and Aug. 17, 1988, memo, they expressed great concern about the

(more)

NWPO/4-4-4

scientific merits of DOE's study, and in the latter memo said that "in subjugating the technical program to satisfy DOE political objectives, we may succeed in making the program comply with regulations, while being scientifically indefensible."

(Attached are copies of the Nuclear Waste Project Office's cover letter to Carl Gertz, DOE's project manager on the Yucca Mountain project, background information, and the preliminary comments.)

###

**NEWS MEDIA CONTACT:**  
Ginger King, 202/586-2835

**FOR IMMEDIATE RELEASE**  
June 2, 1989

**DOE RECEIVES NEVADA COMMENTS ON PROPOSED DOE STUDIES**

The U. S. Department of Energy (DOE) received yesterday comments from the State of Nevada on plans to construct exploratory shafts at Yucca Mountain, Nevada, designated by Congress for site characterization.

"We are pleased that the State has provided their comments as requested by June 1 on the planned exploratory shaft facility at Yucca Mountain," Secretary of Energy James B. Watkins said. "I have assured the Governor and want to assure all Nevadans that the concerns that the State has expressed over the location of the exploratory shafts, will be reviewed and evaluated thoroughly prior to beginning construction of those test shafts."

Under the Nuclear Waste Policy Act of 1982, as amended in 1987, DOE has the responsibility to management the development of a national waste disposal system for the permanent isolation of commercial spent nuclear fuel from the Nation's nuclear power generation and defense high-level radioactive waste. This responsibility includes studies to site, design, obtain a Nuclear Regulatory Commission (NRC) license, construct, and operate a deep, geologic repository for the waste.

Many potential sites have been studied, but in 1987, Congress directed DOE to carry out detailed surface and subsurface studies -- characterize -- only Yucca Mountain to determine its technical and scientific suitability. The comments which the State of Nevada has just submitted are on a 6000-page

document entitled, "Site Characterization Plan for the Yucca Mountain Site," issued December 28, 1988, for public review and comment. That plan describes what DOE knows about Yucca Mountain, what DOE believes it needs to know to determine suitability, and how DOE plans to go about gathering and analyzing those data.

An important activity during site characterization is the construction of exploratory shafts to the depth of about 1,000 feet to put people and equipment in the rock formation to collect and analyze geohydrologic data about the rockbody. While the formal public comment period ended June 1 following public hearings held earlier this spring in Nevada, DOE has indicated that comments received throughout the 5-to-7 years of site characterization are welcome. However, DOE requested comments especially on the exploratory shaft facility by June 1.

The State of Nevada specifically cites in its comments an "earthquake fault" in the proposed exploratory shaft facility area that may compromise the suitability of Yucca Mountain. DOE is aware of the evidence suggesting the possibility of a fault. However, scientists in the program question whether a fault in that location -- at the Coyote Wash -- really exists.

In response to comments made by the NRC in recent discussions, DOE initiated about a month ago a technical review of the geological and geophysical evidence contained in previous studies pertaining to the geology of the proposed exploratory shaft location. This initiative was undertaken to assure that no previous data was overlooked and that current DOE interpretations and conclusions are valid. The DOE and U. S. Geological Survey

(USGS) scientists working on the project question the existence of the fault. USGS scientists are participating in the review which is expected to be completed by mid-July. State scientists will be kept fully informed of the review and the results of the review will be considered by the Secretary and reported to the Governor. The DOE has no intention of proceeding with the development the Yucca Mountain site if data establishing its unsuitability is identified.

The studies reported in 1982 were performed by a geophysical contractor for the USGS, who measured the rocks' resistance to electricity, which can be affected by moisture content, degree of fracturing, porosity and mineralogy. Although the contractor interpreted the local changes in resistivity as a fault, other factors could produce similar readings. Careful examinations of the surface rocks by geologists have failed to confirm the presence of a fault, but its existence cannot be ruled out. There are a number of faults in the vicinity of the site and some additional ones may well be discovered in the construction of the exploratory shaft facility. The significance of individual faults will be addressed during site characterization.

However, before DOE can begin site characterization studies at Yucca Mountain, it must obtain an air quality permit from the State of Nevada. DOE filed its request for the permit early in 1988.

-DOE-

R-89-xxx

## TALKING POINTS

### POSSIBLE EXISTENCE OF FAULT AT COYOTE WASH

It appears that the State of Nevada comments about a potential geologic fault near the exploratory shaft location may be another attempt to discredit the repository program by raising issues already under DOE study and highlighting portions of technical reports out of context.

DOE wants to start collecting new site characterization data as soon as possible so that DOE and state scientists can begin to resolve these old issues that are being raised again and again. Before DOE can begin these studies at Yucca Mountain, it must obtain an air quality operating permit from the State of Nevada.

The fact is that DOE was aware that the inferred fault might exist from geologic mapping studies done in 1979. The information was contained in a published DOE report in 1982, and was considered when the location for the exploratory shafts was selected.

The 1979 studies by the USGS were performed by measuring the rocks' resistance to electricity, which can be affected by moisture, sediment content, porosity and other things.

Two published geologic maps that are based on detailed field mapping by the USGS show no surface evidence of faults at this location (Lipman and McKay, 1965, and Scott and Bonk, 1984).

DOE did not disregard the possible existence of these inferred faults. The SCP contains geologic maps depicting the location of the inferred faults specifically in Chapter 1, pgs 120-122. However, the consensus of Project scientific opinion, including the USGS, is that the existence of the fault is questionable.

Last week, DOE initiated a technical review of the geological and geophysical evidence pertaining to the geology of the exploratory shaft location in response to SCP comments made by the NRC in recent discussions. This initiative was undertaken to assure that no previous data was overlooked and that current Project interpretations/conclusions are valid. The State scientists will be kept fully informed of the review and the results will be considered by the Secretary and reported to the Governor.

DOE does not agree with Governor Miller that it has disregarded the viewpoints of its own scientists. The views of Jerry Szymanski and the USGS scientists are being diligently studied and incorporated in Project plans as appropriate.

DOE would like to work with the State of Nevada so that these technical issues can be resolved. But this cannot be accomplished until the State issues the appropriate permits.

As a final point, it should be noted that the DOE has no intention of proceeding with development of the Yucca Mountain site if data establishing its unsuitability is identified.



## Department of Energy

Nevada Operations Office  
P. O. Box 98518  
Las Vegas, NV 89193-8518

WBS #1.2.6  
"QA: N/A"

**MAY 25 1989**

Leslie J. Jardine, LLNL, Livermore, CA  
Larry R. Hayes, USGS, Las Vegas, NV  
Richard J. Herbst, LANL, Los Alamos, NM  
Thomas O. Hunter, SNL, 6310, Albuquerque, NM  
John H. Nelson, SAIC, Las Vegas, NV  
Joseph C. Calovini, H&N, Las Vegas, NV  
Robert F. Pritchett, REECO, Las Vegas, NV  
Richard L. Bullock, F&S, Las Vegas, NV  
Addanki M. Sastry, MACTEC, Las Vegas, NV

### ANNOUNCEMENT OF ACTIONS UNDERWAY BY THE YUCCA MOUNTAIN PROJECT OFFICE (PROJECT OFFICE) IN RESPONSE TO U.S. NUCLEAR REGULATORY COMMISSION (NRC) CONCERNS REGARDING THE GEOPHYSICALLY INFERRED FAULT IN THE VICINITY OF THE PROPOSED EXPLORATORY SHAFT LOCATION

At the direction of the Office of Civilian Radioactive Waste Management in response to NRC concerns regarding an inferred fault near the proposed Exploratory Shaft Facility (ESF), the Project Office will conduct a Technical Assessment Review (TAR) of the relevant geological and geophysical data, and its interpretation. If necessary, the review will also consider the potential impact the inferred fault may have on the exploratory shaft and ESF Title II design. The enclosure describes the purpose and scope of the TAR, which will be conducted in accordance with Quality Management Procedure (QMP)-02-06. This transmittal satisfies the requirements of Section 3.2, QMP-02-06, of the TAR Notice.

The NRC is expected to raise this potential fault as a Site Characterization Plan comment, and it is important to respond adequately and promptly. The TAR will begin immediately, and it is expected to be completed by mid-July. We anticipate that the required level of support of the team members will average half-time for the next 6-8 weeks.

The purpose of the TAR is contained in the enclosed TAR Plan. Also provided in the enclosure is a preliminary schedule for the review, a list of participating organizations, and composition of the TAR Team. You are requested to make arrangements for appropriate staff to participate in the TAR. A list of suggested team members is included in the enclosed plan. If the named individuals are unavailable, please provide alternates with equivalent qualifications. As the Project Office Designee, Science Applications International Corporation (SAIC) is to conduct the TAR in accordance with this announcement. Richard Lee of SAIC has been named Chairman of the TAR team. The TAR will be initiated with the distribution of training materials and the TAR Package. All team members will be contacted by the TAR Chairperson or their group leader regarding individual assignments and schedule. It is expected that all team members will be asked to attend a tour

MAY 25 1989

Multiple Addressees

-2-

of the Coyote Wash area on June 7, 1989. Additional time in the field may be required of members on the geology team. It is also expected that all team members would be present at the SAIC offices for the week of June 26 to caucus on the TAR Review Memorandum.

David C. Dobson, Chief of the Regulatory Interactions Branch, will be the DOE lead in the TAR. If you have any questions about the details in this letter, please contact him at (702) 794-7940 or FTS 544-7940 or Richard C. Lee of SAIC at (702) 794-7134, or FTS 544-7134.

*Maxwell B. Blanchard*  
Maxwell B. Blanchard, Director  
Regulatory and Site Evaluation Division  
Yucca Mountain Project Office

YMP:DCD-4016

Enclosures:

1. TAR Notice w/Schedule
2. TAR Team

MAY 25 1989

Multiple Addressees

-3-

cc w/encls:

S. H. Kale, HQ (FW-20) FORS  
Ralph Stein, HQ (FW-30) FORS  
Stephan Brocoum, HQ (FW-221) FORS  
Jeffrey Kimball, HQ (FW-221) FORS  
Mohammed Mozunder, HQ (FW-22) FORS  
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Adel Zhody, USGS, Denver, CO  
M. P. Chornack, USGS, Denver, CO

# TECHNICAL ASSESSMENT REVIEW NOTICE

N-QA-010  
1/89

Revision 0

To Yucca Mountain Project Manager Date May 18, 1989

Technical Area to be Reviewed Technical Assessment Review Notice: Geologic & Geophysical Evidence Pertaining to Structural Geology in the Vicinity of the Proposed Exploratory Shaft

WBS No.: 1.2.3.2.1  
(see attachment 1)

Review Date June 7 1989 Location Las Vegas Time see attachment 1

Technical Assessment Review Chairperson Richard C. Lee

Based on a review of the qualification documentation, this Technical Assessment Review Chairperson is qualified to execute the responsibilities of QMP-02-08 with respect to the scope and purpose of this Technical Assessment Review.

Scope of Technical Assessment Review: See Attachment 1

Purpose of Technical Assessment Review: See Attachment 1

Signed 

Reviewed and Approved:

 5/18/89  
Project Quality Manager Date

Attachments:

Background, Purpose and Scope of Technical Assessment Review

**BACKGROUND, PURPOSE AND SCOPE OF TECHNICAL ASSESSMENT REVIEW: GEOLOGIC AND GEOPHYSICAL EVIDENCE PERTAINING TO THE STRUCTURAL GEOLOGY IN THE VICINITY OF THE PROPOSED EXPLORATORY SHAFT LOCATION**

Background: U. S. Geological Survey Open File Report 82-182 (OFR 82-182) shows an interpretation of geophysical resistivity data that indicates a fault may be present near the proposed exploratory shaft site. The NRC has reviewed OFR 82-182 and may request a summary of the actions DOE has taken to address the fault shown by that report. In addition, the NRC may request a summary of the DOE actions that were taken to address the recommendations in Bertram (1984) for additional detailed geological and geophysical work in the vicinity of the exploratory shaft site. The work proposed in the Bertram report was completed; there is a letter report from Dixon to Vieth (1982) on geological mapping and open file reports summarize additional drilling and geophysical work completed in response to the recommendations.

The NRC staff have also expressed interest in an inferred fault near the exploratory shafts shown on SCP Figure 1-40. This figure is based on faults interpreted from geophysical data shown on a map in U. S. Geological Survey Open File Report 84-792. The OFR report does not give any detail on the data on which the map is based, although OFR 82-182 is referenced. R. Stein (DOE/HQ) requested in March, 1989, that DOE be prepared to talk to NRC on this topic by the end of April, 1989. Although a date for discussion with the NRC has not been firmly established, it is envisioned that this TAR will serve as the basis for such an interaction.

Purpose: The purpose of the TAR is to: (1) review the data and interpretations on which OFR 82-182 is based; (2) review the results of other geologic and geophysical investigations that relate to the possibility of faulting in the vicinity of the exploratory shafts; and (3) after reviewing the data, the TAR Team will determine the interpretations allowed by the evidence on the presence or absence of faulting in the vicinity of the exploratory shafts.

The TAR team will also review the existing documentation to determine: (1) how the geologic and geophysical data were considered in making the decision on the location of exploratory shafts; and (2) whether the recommendations of the Bertram (1984) report were adequately implemented.

Scope of Technical Assessment Review: The following tasks will be accomplished by the Technical Assessment Review Team. The findings of the team will be documented in narrative form in the Review Record Memorandum.

1. Review the data collection and processing techniques, and subsequent interpretations, which form the basis for the proposed existence of the small fault shown near the location of the exploratory shafts in U. S. Geological Survey Open File Report 82-182. The TAR team will establish and document criteria for the technical reviews. They will then summarize the original objective and purpose of the work, the limitations of the data, and they will evaluate the interpretations (including alternatives) supported by the data. If appropriate, sources for review criteria will be identified.

2. The TAR Team will determine what other geologic and geophysical data are available that may bear on the presence or absence of a fault near the location of the exploratory shafts. The TAR team will review any such data discovered and determine the original purpose of the work, the implications of the data with respect to the presence or absence of faulting in the vicinity of the exploratory shafts, and the limitations of the data.
3. At the discretion of the TAR chairperson, the reviews described in 1 and 2, above, may also include a detailed field review of the geologic mapping in the vicinity of the exploratory shafts, or field reviews of the geophysical work by members of the TAR team, or qualified designees. Prior to conducting any proposed field reviews, the TAR team shall establish and document criteria for the review.
4. After completing Items 1, 2 and 3, the TAR team will determine whether the possible fault shown in U. S. Geological Survey Open File Report 82-182 was adequately considered during the selection of the exploratory shaft location. The team will develop criteria for the determination, and then evaluate the impacts on the exploratory shaft and ESF Title II design process if it was concluded that a fault did exist.
5. The TAR Team should consider, and make recommendations on, future work that should be undertaken as a result of the findings of the technical assessment.
6. Following completion of the tasks described above, the TAR Team will compile a report which summarizes the results of the assessment, and specifically addresses at least the following topics:
  - A. Historical perspective: summarize the sequence of events that occurred relevant to this topic, and the documents that exist in YMP files regarding the geological and geophysical work.
  - B. Geophysical perspective: summarize the past work, the rationale for conducting the studies, the interpretations (and alternatives) that are consistent with the data, and the limitations of the data.
  - C. Geological perspective: summarize the rationale for, and the results of, the past studies, the interpretations (and alternatives) that are consistent with the data, and the limitations of the data.
  - D. Results of field checks (optional): summarize any work accomplished, and what results are indicated.

- E. Summary and recommendations, to include, at a minimum:  
 (A) assessment of the data relevant to the possible presence of a fault near the proposed ESF, (B) evaluation of whether the available data were adequately considered during the process of selecting the proposed shaft locations; (C) perspective on the possible impact on Title II design if the presence of a fault was demonstrated; and (D) recommendations for further action.

### Logistical Information for the Technical Assessment Review

The first meeting of the Technical Assessment Review Team will be convened by the Review Chairman in May, 1989, in Las Vegas. The current schedule is shown below. Members of the team will be named by the Review Chairman, who will establish and document criteria for their selection. Team members will be notified of further details as they become available.

### ESF Resistivity Fault TAR Schedule

<u>Week</u>	<u>Goal</u>
May 22, 1989	TAR Chairman makes contact with each team member; Initiate TAR and distribute Plan; Define and qualify team; distribute TAR Package.
May 26	Team members have telephone conferences with team leaders; reading assignments are completed; strategies are defined.
May 30	Preparation for field trip to Coyote Wash area; continuation of work.
June 7	Field trip to Coyote Wash taking one full day in field; one to four days of additional verification work as required by Geology team leader.
June 12	Any re-interpretation of geologic data completed.
June 19	Any re-interpretation of resistivity data completed.
June 26	TAR team caucus; complete preliminary draft of FRM.
July 10	Final FRM completed.
July 17	Transmit TAR Data Package to Document Control.

18-May-1989

Attachment 1, Rev. 0, Page 4 of 4

REFERENCES

Bertram, S.G., 1984, NWSI Exploratory Shaft Site and Construction Method Recommendation Report, SAND 84-1003, Sandia National Laboratories, Albuquerque, NM.

Letter from G. Dixon to D.L. Vieth, July 16, 1982, discussing detailed geologic mapping of 5 sites recommended by Ad Hoc TOC Committee.

Smith, C. and H.P. Ross, 1982, Interpretation of Resistivity and Induced Polarization Profiles with Severe Topographic Effects, Yucca Mountain Area, Nevada Test Site, Nevada, USGS OFR 82-182, Open File Report, U.S. Geological Survey.

USGS (U.S. Geological Survey), 1984, A Summary of Geologic Studies Through January 1, 1983, of a Potential High-Level Radioactive Waste Repository Site at Yucca Mountain, Southern Nye County, Nevada, USGS OFR 84-792, Open File Report, U.S. Geological Survey.

TAR Team

YMPO Branch Chief responsible for TAR: David Dobson  
TAR Chairperson: Richard Lee  
TAR Secretary: Marshall Davenport

SAIC FTS 544-7134  
SAIC FTS 544-7661

Team Members:	Team/discipline	
Dave Dobson	Geology	YMPO FTS 544-7940
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Jeff Kimball	Geophysics & Geology	DOEHQ FTS 896-1063
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