



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

Reply to:

301 E. Stewart Ave., #203  
Las Vegas, NV 89101

DATE: January 21, 1994

TO: William Reamer, Acting Director  
Repository Licensing and Quality Assurance Project  
Directorate

FROM: Philip S. Justus, Sr. *Philip S. Justus* On-Site Licensing Representative,  
HLPD

SUBJECT: ON-SITE LICENSING REPRESENTATIVE'S REPORT ON YUCCA  
MOUNTAIN PROJECT FOR NOVEMBER AND DECEMBER 1993

INTRODUCTION

During the fifteenth and sixteenth months as On-site Licensing Representative (OR), I participated in five site visits, including N-tunnel on Nevada Test Site, Advisory Committee on Nuclear Waste meeting in Las Vegas, Yucca Mountain Project (YMP) Project Manager's (PM)/Technical Project Officer's (TPO) meeting and the Nevada Legislature's Committee on High-Level Waste, and got acquainted with newly appointed Acting PM, R. Nelson, Jr., among other activities. This report summarizes those activities that I consider particularly relevant to staff work.

A principal purpose of these OR reports is to alert NRC staff, managers and contractors to information from DOE's programs for site characterization, repository design, performance assessment and environmental studies that may be of use in fulfilling NRC's role during prelicensing consultation. Relevant information includes such things as new technical data, DOE's plans and schedules and the status of activities to pursue site suitability and Exploratory Studies Facility (ESF) development. In addition to communication of information, any potential licensing concerns identified are reported, as appropriate. The principal focus of this and future OR reports will be on DOE's programs for ESF, surface-based testing (SBT), performance assessment, data management systems and environmental studies (at this time, mainly water resources).

EXPLORATORY STUDIES FACILITY (ESF)

1) TEST ALCOVE #1 CONSTRUCTION DECISION POINT. Drilling and blasting of Test Alcove #1 and Construction Monitoring were the two significant ESF activities in November-December (see Report for October 93). On 12/2, on behalf of NRC staff who were invited

*enclosed on  
sheet on  
12/16/93  
TPU MRG*

9402020017 940121  
PDR WASTE  
WM-11 PDR

*2403-11  
WM-11  
102*

by DOE, I observed the Alcove working face at O+27.4m (O+90 ft) and on-site discussions among the geologist Principal Investigator (PI), the hydrologist PI, test coordinators, constructor, and others, on whether or not to continue advancing the face to a point where radial borehole (BH) tests could begin. The geologist PI considered that the face was still in a shear zone, that a second shear zone trend was intersecting there, and recommended that two or three more 8 ft rounds be shot, the walls mapped, and another decision be made on whether or not to continue. This was agreed to on the spot. However, the shots would be delayed, probably to January, until the hydro testing equipment was assembled on site and operational to ensure that the tests could begin within the time limit imposed to mitigate contamination of in situ gases by atmospheric mixing. A third round was planned to buy time for the testers. Enclosure 2 illustrates the alcove's status. The ORs were notified in early January that three rounds would be shot in mid-January and the next decision point would be on or about January 26th. A detailed layout plan and section of the 8.3.1.2.2.3.3 and 8.3.1.2.2.4.8 tests is found near end of Enclosure 6.

2) UNDERGROUND TESTING IN ESF AND TEST ALCOVE #2. YMPD has apparently reviewed all of the test requirements described in all of the activities in the SCP that are to be conducted in the ESF 5-mile loop. Planning for these was discussed by N. Elkins, LANL, at ACNW meeting 12/13 (Enclosure 6). Testers proposed more than 40 separate test activities be conducted in 30 different test alcoves. The four principal investigating organizations are: USGS, SNL, LLNL, LANL; LANL was selected as the coordinator. A consolidation and prioritization effort is underway. The resulting revised project test plan will be reflected in the ESFDR document, Appendix B. The ESFDR will continue to be a key reference for NRC staff; especially for staff who review data, models and codes related to hydrology, rock engineering, geology, geochemistry and thermal response. Alcove #2 is planned for the Bow Ridge Fault tests described in 8.3.1.2.2.3.10; 8.3.1.15.1.1,.2,.3,,.4; and 8.3.1.15.5.1. The Test Planning Package is expected Summer94. See Enclosure 6 for location of Alcove #2 on North Ramp Plan and Section drawing.

3) WATER USED TO CONSTRUCT ESF. Total water used through 12/20 in test alcove was about 145.4 kiloliters (38408 gallons). Total amount of traced water used in ESF through 12/20 was about 1670 kiloliters (441221 gallons).

4) CONSTRUCTION MONITORING (CM) ACTIVITIES & DESIGN VERIFICATION (DV) ACTIVITIES. At the 12/16 TPD meeting, J. Pott explained CM activities and DV activities (Enclosure 1F). Temporarily installed instruments used to measure certain effects of construction are referred to as CM tools (see Sept93 & October93 Reports). There is no Study Plan for CM activities. However, similar instruments, permanently installed and operated under Study Plan 8.3.1.15.1.8

(for WBS 1242114) are referred to as Design Verification tools. The DV tools will gather data to verify ESF design methodology, evaluate safety (i.e., serve as CM tools), and provide bases for repository design. DV activities include:

- blast monitoring by seismometers
- blast damage by BH televiewers
- rock mass quality by tape extensometers (convergence pin method)
- ground support monitoring by rock bolt load cells
- drift stability monitoring by MPBX, in situ stress gauges, tape extensometers.

Data derived from CM and DV activities are reported to the constructor and documented in the Participant Data Archive with TDIFs as outlined in Enclosure 1F. The installation of three multi-point borehole extensometer gauges (MPBX) in the Starter Tunnel was completed in December. See Enclosure 3 for their location and configuration. Heads Up - A comprehensive report on CM and DV data collected from Day 1 through March 94 is due to YMPD June 94.

5) PROCEDURE FOR MANAGING SAMPLES FROM ESF. It was mentioned at the Sample Oversight Committee meeting that I attended on 11/3, that handling of wallrock and borehole samples from the ESF was not covered by any approved procedure. This condition was remedied by a Field Change Request. Effectively, the same procedures that exist for handling surface samples would be applied to the ESF, namely, YLP-SII.1Q-SMF Rev.0, "Removal of Whole and Other Specimens From Samples by the SMF For Shipment and Remnant Return."

6) PROBE DRILLING AHEAD OF TBM. This closes a matter that I queried YMPD on (see Feb-Mar 93 Report). ORs were informed that the tunnel constructor might drill ahead of the TBM to determine the engineering properties of the rocks that lay in its path. I asked for a description of the method of drilling ahead of the TBM. A second question concerned sealing probe holes. The recently hired constructor apparently has no plans for routine probe drilling in the ESF. Apparently, probes are not needed in a dry, gas-free environment like that expected in the ESF. However, he has plans to probe drill into faults that lie ahead of the TBM, e.g., Bow Ridge Fault, which lies about 300 ft beyond face of Starter Tunnel. The ORs were informed that a track-mounted drill located behind the TBM would drill ahead of the TBM either at an angle through the tunnel wall or crown. This requires that the TBM stop while drilling proceeds and the hole is instrumented. The TBM will have the capability for a probe drill to be mounted to it. Such a rig, if purchased, is intended to probe along the alignment of the TBM, and operates while the TBM is stopped. Apparently probe drilling of faults will be considered on an ad hoc basis subject to evaluation of tests from previous fault crossings.

7) UNUSUAL GEOLOGICAL OCCURRENCES AND TBM OPERATION. At the ACNW meeting that I attended on 12/13, DOE was questioned on what conditions it would take to halt the TBM, and who would decide. The response mentioned concepts, or thresholds, that are apparently being developed by DOE for application to this site: what would constitute an unusual geological occurrence or an ambient condition that is not understood (that, when encountered, could stop construction). DOE indicated, for example, that it might determine or estimate what stratigraphy and structures the TBM should expect to encounter, and then look for "deviation from the norm." The ORs will report promptly on DOE's development of the definition of what is to be expected and what would be considered unusual at the site, given the bearing of such matters on regulatory issues, open items and the direction of site characterization activities.

8) OPPORTUNITIES TO OBSERVE DOE ACCEPTANCE REVIEWS OF CONFIGURATION ITEMS. The ORs were informed that NRC staff will be invited to attend acceptance reviews of the following configuration items in FY94, probably not before the spring (see October93 Report): TBM Starter Tunnel, Test Alcove #1, TBM, ESF Pad and Access Road, Pad Water System, Rock and Soil Storage Area, Switchgear Building.

9) ESF CONSTRUCTOR ANNOUNCED ITS ANNUAL HOLIDAY SHUTDOWN. At the Test Coordination meeting that I attended on 12/2, REECO announced that its operations at YMP will largely shut down from 12/17/93 through 1/2/94. Shotcreting of the boxcut highwall and ESF Starter Tunnel, and some other work, would take place.

10) STATUS OF ESF FY94 PLANS. The following summarizes the major ESF milestones and planned activities for FY94, discussed by W. Simecka at the 12/16 TPO meeting that I attended (Enclosure 1C). Note that the new data to be collected in ESF in FY94 will stem from borehole tests in Alcove #1; routine construction monitoring and design verification measurements (see ESF Item 4, above); and the approximately one month of TBM operation. The ESF planned FY94 activities are:

- Procure and install water system
- Procure and install sanitary sewer system
- Procure surface conveyor system
- Prepare and install compressed air system
- Prepare and install electrical distribution system
- Complete 69kV system
- Erect Switchgear building
- Receive and set up Tunnel Boring Machine
- Operate TBM for approximately 1 month
- Install subsurface utilities
- Procure spares for TBM
- Procure and install rail system
- Complete design of Package 1, 2 and 8B (North Ramp extension)
- Start design of Package 8A (TSL Main Drift)

## SURFACE-BASED TESTING (SBT)

1) SAMPLE MANAGEMENT ITEMS. Several items of interest came up at the Sample Oversight Committee meeting that I attended on 11/3. (a) An approved procedure for handling samples from the ESF apparently has been established (see ESF Item 5, above).

(b) Samples approved for removal and study by researchers not working under approved QA programs (non-DOE participants) are effectively rendered non-reusable. Participants are required to maintain traceability, non-participants have no such requirement. Consequently, it appears that remnants cannot be returned to the "archives" for credible reuse because the chain of custody for them was not preserved. This matter is being addressed by DOE and apparently will be communicated in FY94.

(c) A request for samples from a non-DOE participant to conduct tests of potential bacterial activity in underground rock mass was discussed. A DOE lab is approved to conduct similar tests. A discussion on protocols and priorities of 'competing' groups accessing samples is in the meeting record.

(d) The remnants of samples that undergo certain tests are actually replaced in their position in the original container. Thus, there are exceptions to the rule that remnants of core removed from its original container are not returned to the container. Remnants are generally archived in a storage area for remnants (see Section 5.6 Remnant Return, in YLP-SII.1Q-SMF). Mechanical testing of core done on-site may result in fragmentation of that core. Such remnants are to be returned to their original location within the container (Section 5.3, On-site Mechanical Testing, *ibid.*). Core pieces returned to a box are to be clearly marked as such. Nevertheless, staff reviewing core in the box should consider additionally checking the SMF Specimen Removal Log and core videos and photos of the intervals of concern to be sure that the samples of interest are in their original condition, if that is important to know.

2) UZ-14. By 12/13 cored to 440 meters (1442.11 ft); reamed to 433 meters (1421.64 ft). Completed fifth cement grout phase. The LM-300 drillrig will be moved to SD-12 in January94. UZ-14 will be completed to TD of about 610 meters (2000 ft), below water table, as planned, but not with the LM-300. (Enclosure 1D).

3) UZ-16. Air permeability testing of Tiva Canyon is underway and will continue into February. A May94 walkaway Vertical Seismic Profiling test using 96 grouted geophones is planned. (Enclosure 1D).

4) C-WELL COMPLEX. On 11/3, I witnessed the raising of the Stratton rig on C-3. Installation of packer system began on 11/4; testing is scheduled to continue through FY94. (Enclosure 1D).

5) NRG BOREHOLES. Gyro BH surveys are scheduled for 1/94 in NRG-2, 2A, 2B, 3, 4, 5, 6(?). NRG-7/7A spudded 10/21/93 and cored to

984 ft by 1/6/94; core recovery has been 50-60% in some intervals, with no recovery from some runs. NRG-8A, 8B, 8C are on hold pending the outcome of NRG-2C, 2D (these are hollow-stem auger holes associated with development of Trench NRT-1).

6) GHOST DANCE FAULT 'PAVEMENT.' The excavation was reviewed on 12/14. Clearing of the pavement is complete for the moment. Survey points for geologic mapping will be installed soon.

7) ALICE RIDGE TRENCHES. Trenches A-1 & MWV-T3 are complete. Existing A-1 was deepened to 10 ft and lengthened to 100 ft. Soil Engineer's report is needed prior to mapping. MWV-T3 was excavated approximately 230 ft long by 10 feet deep. The apparent target is the Paintbrush Canyon Fault. (Enclosure 1D).

8) ROCK VALLEY TRENCHES. A YMP-USGS field trip was held on 12/15. Apparently three trenches will be constructed, two will be in Area 27, one in Area 25; also several pits are planned. Functional requirements are being prepared. Trenches are to be constructed 2/94 as stated at TPO meeting of 12/16. (Enclosure 1D).

9) EXILE HILL TRENCH EXPOSES 'SOFTGROUND' THE TBM WILL ENCOUNTER NEAR THE BOW RIDGE FAULT. The following discussion is based upon J. Pott's presentation at TPO meeting on 12/16 (Enclosure 1F), a location map provided on 1/20 (Enclosure 4), Test Coordination meeting and my field observations of 1/6. Two trenches are planned on west side of Exile Hill to expose the white ash fall non-welded, non-lithified, tuff that was identified in some of the NRG-2 BHs (e.g., NRG-2A, 2B) as softground juxtaposed with the Bow Ridge fault. This rock unit is about 90 ft thick and lies stratigraphically below the Ranier Mesa Tuff and above the Tiva Canyon Tuff. It is referred to by DOE workers as the Pre-Ranier Mesa Tuff. Geologists estimate that the TBM will bore through the Pre-Ranier Mesa Tuff for about 200 to 250 ft. The tunnel constructor needs to know the stand-up time and bearing capacity of the Tuff to decide how to penetrate this zone without hanging up the TBM and unduly risking collapse of the tunnel. The first trench, NRT-1, was started on 12/20 and nearly completed by 12/30. Faults, steeply dipping to the west, are present in both walls. Faults and other features are being mapped by Geomatrix contractor. The walls were being cleaned first week in January 94. Tests planned include high-resolution seismic reflection and refraction surveys (2 east-west lines, 1 north-south line completed Dec), BH video survey of hole stability as casing was removed from NRG-2A & 2B (completed Dec), in situ grouting capability, post-grouting strength, unconfined compressive strength and plate bearing pressure. The ORs will report on these activities in January.

10) EXTENT OF NATURAL BARRIERS AT YUCCA MOUNTAIN. At the ACNW meeting on 12/13, DOE introduced several concepts and boundaries related to the natural barrier system at YM (Lateral Extent of Natural Barriers, map YMP-93-331.0; Enclosure 7). A "conceptual

controlled area" apparently is coincident with the "test and waste isolation evaluation zone." This area (zone) includes an area of natural barriers in the unsaturated zone that lies within an area of natural barriers in the saturated zone.

11) VOLCANISM. Prof. G. Thompson, consultant to DOE, is scheduled to deliver a report to DOE end of FY94. LANL final report due to YMPO 12/93.

12) LARGE BLOCK EXPERIMENT (LBE) PREPARATION. REECO completed drilling and temporarily plugging 17 vertical boreholes through a steel template into the test block, by end of Dec. The ORs will continue to follow and review this activity and report the progress accordingly.

13) REDEFINITION OF THE VOLCANIC STRATIGRAPHIC STRATIGRAPHY AT YM. At the TPO meeting on 12/16 that I attended, D. Buesch, USGS, reported on the USGS's revision of stratigraphic nomenclature and criteria for macroscopic identification of lithostratigraphic units at YM, to be published as an Open-File Report in 1994 (Enclosure 16). The USGS has applied field-oriented criteria (mainly observation of phenocrysts, texture, structure, degree of welding and crystallization, geometry and surface roughness of fractures) to enable thin, but distinctive, rock intervals to be correlated from borehole to borehole at YM. This is a very important achievement because it eliminates the confusion of apparently independent terms applied to the identification and correlation of thermo-mechanical (e.g., welded, lithophysae-poor) and hydrogeological (e.g., welded hydrogeologic) rock units by simply basing them on observable rock features (e.g., crystal-poor, glassy). The new volcanic rock identification criteria, classification scheme and terms can be applied to surface (e.g., pavements) and subsurface (e.g., ESF) samples. The USGS work apparently shows that the boundaries of lithostratigraphic, thermo-mechanical and hydrogeologic units correlate with the boundaries of zones of welding and crystallization in volcanic tuff cooling units.

This rock identification and classification scheme is a tool that, when applied uniformly by all participants, should facilitate prediction of a more detailed stratigraphy in drillholes and tunnels than was possible before. However, the new terminology did not appear in the 12/10/93 cross section through Exile Hill North Ramp (SNL Drawing 88-60-08).

14) GEOPHYSICS. At the ACNW Site Visit on 12/15, M. Tynan briefly discussed the the status of geophysical investigations. He indicated that a seismic reflection survey across Crater Flat (line #2) and across YM and Midway Valley (line #3) had high priority and would likely be completed in FY94 (Enclosure 8, loc. map); SNL gathered the data on 12/9. He pointed out that the following participants were actively involved in interpretation of geophysical data: SNL, seismic; LBL, seismic and VSP; SAIC, seismic

and BH; EG&G, 3-D model; USGS, VSP, gravity, magnetics, BH. Some objectives of geophysical investigations in support of ESF design are: determine dip of Ghost Dance Fault and its characteristics at repository depth; depth to repository horizon; distribution of "soft rock" (see SBT Item 9, above); engineering rock properties (Enclosure 8). At TPO meeting, 12/16, YMPD reported that logging of North Ramp BHs would be complete by 4/94; historical and current seismicity studies, present phase, would be summarized by 9/94; seismic surveying contractor to be selected by 3/94 (USGS is considering conducting the surveys itself under Study Plan 8.3.1.4.2.1); seven additional digital seismic monitoring stations to be installed by 9/94. ORs will continue to report on developments in these areas.

15) SUNDANCE FAULT ZONE. At the ACNW Site Visit to YM on 12/15, R. Spengler, USGS, briefing the visitors on the Ghost Dance Fault mapping project, mentioned the Sundance Fault. He indicated that a publication on the Sundance was in process of being approved by USGS, and he would likely make a presentation on it at the International HLW Conference in May in Las Vegas. I understood that the Sundance represents a northwest-trending pattern of fractures and breccia, that it appears to offset the Ghost Dance Fault zone, that it appears to trend into the Solitario Canyon Fault, among other things. I reported these by phone to NRC HQ staff. The Sundance Fault was discussed in the local newspapers on 1/6 and 1/7/94. DOE released a summary of the draft USGS HLW Conference paper with location maps on 1/7. These were sent to HQ. Copy is available in the OR office.

16) SOLITARIO CANYON FAULT HYDROLOGIC PROPERTIES. It was pointed out by USGS at the ACNW Workshop on 12/14 that the current SCP plan (Study Plan 8.3.1.2.2.3) to study certain hydrologic properties of the Solitario Canyon Fault by horizontal borehole drilling might be dropped or changed to use the proposed ESF North Ramp Extension instead.

17) SEISMIC HAZARD TOPICAL REPORT. DOE's seismic hazard working group expects to submit a Topical Report on Seismic Hazards to NRC in February 94 (from DOE presentation to ACNW, 12/13).

18) STATUS OF SBT AND UNDERGROUND TESTING (UGT). At the TPO meeting of 12/16, R. Dyer discussed the status of SBT and UGT (Enclosure 1D). Some highlights of FY94 plans not mentioned above follow. Reports due: a) Magnetics and gravity across Ghost Dance Fault, 4/94; b) Final report: Bow Ridge Fault Study, 5/94; c) Final summary report: technical data information forms of Midway Valley studies, 5/94; d) Progress report: Ghost Dance Fault, 8/94; f) North Ramp cross section to YMPD 1/94; g) FY94 Annual Plan to YMPD, 1/94.

## PERFORMANCE ASSESSMENT AND NATURAL ANALOG ACTIVITIES

1) COMPUTER CODES IN USE BY DOE. I compiled this list of computer codes that are apparently up and running in the DOE program from various speakers from DOE and its participant organizations who made presentations at the ACNW Workshop on 12/14. For your information, they are: YMIM (LLNL), AREST (PNL), TSA (SNL), RIP (Golder), TOUGH2 (LBL), FEHM (LANL), FRACMAN (Golder). Others may have been mentioned; the Workshop transcript should be referred to for those who want to know the context in which the codes were discussed.

2) TOTAL SYSTEM PERFORMANCE ASSESSMENT (TSPA) MODELS MAY NOT REPRESENT A HYDROLOGIC COMPONENT OF YM SITE. At the ACNW Workshop, 12/14, a USGS PI discussed his observation that certain site-specific hydrologic models were apparently not connected to the TSPA models. He suggested that the TSPA models, therefore, cannot be used for early site suitability evaluations. Conceptual hydrologic models of YM system were discussed throughout the Workshop. If one of these subjects is within the scope of the DOE/NRC Technical Exchange on TSPA scheduled for June 20-21, the staff should consider the Workshop transcript as a relevant source of information.

3) NATURAL ANALOGS OF YM. At the ACNW Workshop, 12/14, YMPO Branch Chief restated DOE's consideration that certain New Zealand geothermal fields provide good analogs for model validation and verification. He also suggested that "Yucca Mountain is an analog of itself," inasmuch as the volcanic rock section was heated in the past, and the rocks' response to the Tertiary volcanogenic heat sources might be analogous to their future performance under radiogenic heat sources.

## GENERAL

1) ROBERT M NELSON, JR., ACTING PROJECT MANAGER OF YMPO - GOALS AND PLANS. The ORs met with Mr. Nelson on 12/6 in his office. He became Acting PM effective 11/15. The ORs explained their roles and reviewed with him the key mode of OR/DOE interaction in the context of the DOE/NRC Procedural and Site-Specific Agreements. The ORs expressed their general satisfaction with DOE's fulfillment of the Site-Specific Agreement and with the openness and cooperation of DOE's and participants' staff afforded the ORs. He agreed to meet with the ORs regularly. At this meeting, and two others in December, Mr. Nelson expressed some of his goals and plans. The following are some highlights.

At the ACNW meeting, 12/13, Mr. Nelson indicated that his detail as PM would likely be for up to one year; that he intends to emphasize DOE's role as manager of the YMP; that he does not want

DOE to be a factor in local elections; and that DOE presentations would be objective and non-promotional. At the TPO meeting, 12/16 (Enclosure 1B), he elaborated that he intended for the DOE staff to spend more time as technical managers and less time reacting to the 'next meeting.' He wants DOE to do better at holding participants and managers accountable for their commitments. He will propose a reorganization of YMPO soon. He considers that a key issue in the national HLW program is how the project is to be funded for the long-term. Mr. Nelson speculated that, beginning around FY95, regardless of the type or amount of funding, OCRWM likely would effect some significant changes in the DOE HLW program.

2) MR. NELSON ON DOE/NRC AND DOE/AFFECTED UNITS OF LOCAL GOVERNMENT (AULG) RELATIONSHIPS. At the TPO meeting, 12/16, Mr. Nelson explained that he intends to keep the good relationships with NRC and AULG. He elaborated that his Rocky Flats, CO, experience was positive in regard to DOE benefitting from its close contacts with its regulator, i.e., State of Colorado, and with local governments. He found that a good DOE policy was one that laid out the facts for all affected entities to consider, and for DOE to face the facts.

3) EDISON ELECTRIC INSTITUTE (EEI) MEETING SUMMARY. DOE distributed at the 12/16 TPO meeting, a summary of some statements made at a 12/1-2/93 EEI meeting. The following excerpts specifically mentioned DOE/NRC interactions. EEI noted an area of progress by YMP, "DOE is interacting with NRC in a somewhat more proactive manner. This development already seems to be yielding benefits for the project." Also, "...There seems to be a significant lack of emphasis on actual issue resolution with NRC via recognized methods. The disconnect between the seismic hazard topical report schedule and the ESF schedule is an example of the effect of this inadequate process. It is unsatisfactory that DOE does not have a current and proactive schedule for issue resolution" (Enclosure 1B).

4) PUBLIC MEETING OF NATIONAL ACADEMY OF SCIENCES/NATIONAL RESEARCH COUNCIL COMMITTEE ON TECHNICAL BASIS FOR YUCCA MOUNTAIN STANDARD. On 11/9-10, I attended the third Las Vegas meeting of the NAS/NRC Committee along with four NRC HQ staff. The group heard about YM geology, volcanism and earthquake probabilities and effects, controls of future human intrusion (see Agenda, Enclosure 9). The handouts from this meeting are on file at HQ. (See my May-June 93 report for description of Committee's purpose).

5) SEMI-ANNUAL PROGRESS REPORT #9 (PR#9) TO BE ISSUED. The ORs were informed that DOE's PR#9 will be issued end of January 94.

6) NYE COUNTY/DOE MOU. On 12/2, Nye Co. and DOE reportedly were close to signing an agreement which would allow Nye Co., under the direction of its hydrological consultant, M. Mifflin, to drill up to four holes to the water table on Area 25 environmentally-

permitted sites in FY94-95.

7) TRANSFER OF DOCUMENTS BETWEEN DOE AND NRC ON DISKETTES. This item documents an informal arrangement made between ORs and YMPD on 11/3 to exchange disk copies of documents upon request (initial inquiry reported in Monthly Report for July-Aug93). Chief, Reg Interactions Branch, proposed three stipulations which were agreed to by Acting Director, DHLWM: 1) Disk does not go to the PDR. OK with NRC. PDR does not accept disk copies as official records, only signed, hard copy; 2) Transfer is bilateral. If other parties wish similar privilege they would need to make separate request to DOE. OK with NRC. The subject document would have already been transmitted in hard copy to interested parties by DOE. Disk transfer to NRC is not expected to impede the flow of information from DOE to other parties; 3) NRC is to make the same courtesy available to DOE, upon request. OK with NRC. As long as the transaction is informal and will not involve special disk QA or security measures, no problem is anticipated in meeting a request. First transfer was a 5 1/4" disk of Erosion Topical Report text sent to NRC in Nov. The figures were not included because they were not on Wordperfect5.1.

8) ADVISORY COMMITTEE ON NUCLEAR WASTE (ACNW) FULL MEETING, WORKING GROUP MEETING, AND YM TOUR. I attended the ACNW's three day program in Nevada. On 12/13, ACNW held its 59th meeting, the second in Las Vegas (see Agenda, Enclosure 10A). On 12/14, ACNW held a Working Group Meeting on 'Unsaturated Zone Flow at the Potential Yucca Mountain HLW Repository Site' in Las Vegas (see Agenda, Enclosure 10B). On 12/15, DOE hosted a tour of YM for ACNW (see Itinerary, Enclosure 10C). Selected items stemming from the meetings and tour are described throughout this report. The meetings were transcribed and should be referred to for details. Most handouts are on file in the OR office.

9) SENATOR THOMAS HICKEY'S COMMENTS TO ACNW. At the ACNW meeting on 12/13, Sen. T. Hickey made several comments of interest to NRC. Some of them were, to the effect: a) keep up NRC's critiques of DOE's technical program and results; he cited the CNWRA's review of Volcanism report positively; b) increase NRC's presence in Nevada; he cited increase in ORs from one to two positively, but sees need for more staff due to increased "fragmentation" of DOE project; move CNWRA to NV; c) an appreciation of the ORs' "local cooperation."

10) YMP'S FIRST TECHNICAL PROGRAM REVIEW ANNOUNCED. At the ACNW meeting, 12/13, DOE announced that it will hold a public review of the "intellectual stage of knowledge" of virtually all program elements. Meetings will be at Stardust Hotel from 2/14-18/94.

11) ISSUE RESOLUTION AND SCA OPEN-ITEM STATUS. At the ACNW meeting on 12/13, A. Gil, Acting Branch Chief, DOE, presented a status report on issue resolution (Enclosure 11). DOE has selected eight

issues for early resolution from about 24 issues considered. It has working groups seeking resolution of these issues: 1) erosion; 2) calcite-silica; 3) volcanism; 4) seismic hazards; 5) engineered barrier system; 6) substantially complete containment; 7) disturbed zone; 8) groundwater travel time. Latter two have been combined. Also, DOE provided ORs with a list of SCA Open Items and their status. This was forwarded to NRC staff in December.

12) STATUS OF TOPICAL REPORT ON EXTREME EROSION. This matter came up at the ACNW meeting, 12/13. During A. Gil's presentation, Chairman D. Moeller inquired about NRC staff's review previously scheduled for completion end of Dec. I responded that the staff review could not be completed before DOE submitted all reference material needed by NRC staff. DOE would be submitting this material to NRC by end of Dec. Also, it had already been mentioned that prior to completing its review, NRC staff planned to observe key erosion field sites mentioned in DOE's Topical report. A Site Visit was planned for February.

13) STUDY PLANS TO BE SUBMITTED TO NRC IN FY94. At the TPO meeting on 12/16 DOE handed out a schedule of about 24 Study Plans it intended to submit to NRC for review in FY94. This was sent to HQ staff in Dec (Enclosure 1D).

14) STATUS OF YMPD COST REDUCTION STEERING COMMITTEE EFFORTS. At the TPO meeting on 12/16, several on-going efforts to examine cost reduction were discussed. One recommendation under consideration is to consolidate four procedures into one user friendly procedure. The four are: AP5.21Q Field Work Activation; AP5.32Q Test Planning and Implementation Requirements; AP5.37 Job Package Engineering Cost Estimates; and AP6-22Q Job Package Completion Records (Enclosure 1E).

#### ON-SITE REP (OR) ACTIVITIES

1) PARTICIPATE IN NEVADA LEGISLATURE'S COMMITTEE ON HIGH-LEVEL RADIOACTIVE WASTE MEETING. The Committee met in Las Vegas on 11/12 to be briefed by NRC, DOE, State of Nevada and Affected Units of Local Government (AULG) on the status of each organization's view of DOE's scientific and technical studies and of concerns or disputes (see Agenda, Enclosure 5A). DOE's summary is Enclosure 5C. The OR's presentation is summarized in Enclosure 5B. Handouts of other participants were not available to all attendees, but may be found in the transcript. About 20 people attended. The Committee was chaired by Senator T.J. Hickey, Las Vegas. Other Committee members in attendance are listed in Enclosure 5D. I've enumerated 14 matters of interest to the Committee that were raised at the meeting, and noted several that the Committee wants NRC to followup (Enclosure 5D). Committee interests are broad and include concerns about repository design, safety of workers and residents, loss of natural resources, liability for accidents and releases,

State jurisdiction in permitting, transportation of waste across Hoover Dam. Selected items of DOE and State interest are listed in Enclosure 5D. The OR presentation described NRC's role in the HLW program, described how NRC implements its responsibilities, discussed selected on-going staff activities, reviewed how the staff is building its review capability, facing the challenges of licensing a repository and summarized how the staff is helping to ensure that DOE considers the regulatory aspects of site characterization. Responses to the Committee's followup questions are in preparation.

2) SITE VISITS. I participated in these site visits with NRC/CNWRA staff in Nov: to NTS for CNWRA observation of N-tunnel and various hydrology-oriented sites, 11/16; Appendix 7 to YM by CNWRA hydrologists, 11/17; and in Dec: ACNW tour of YM, 12/15.

3) ATTEND TPO MEETING. I attended the TPO meeting on 12/16 (see Agenda, Enclosure 1A). The various presenter's handouts comprise Enclosure 1B-H. Each presentation is discussed in the above sections, except the Summer Intern Program (see Enclosure H).

4) NRC STAFF VISITORS. The following NRC staff visited the site and/or attended meetings in Las Vegas in Nov: M. Federline, N. Eisenberg, J. Furth, J. Kotra, T. Nicholson; in Dec: W. Ford.

Enclosures:

1A.	TPO Meeting	Agenda		12/16
B.	" "	General	R. M. Nelson, Jr.	"
C.	" "	Status of ESF	W. B. Simecka	"
D.	" "	Status of SBT	J. R. Dyer	"
E.	" "	Cost Reduction	R. G. Vawter	"
F.	" "	DV & CMA	Kessel and Pott	"
G.	" "	Stratigraphy	D. Buesch	"
H.	" "	Summer Intern	C. D. Van Natta	"
2.	LANL Wkly Rep.	Alcove #1 Drawing		12/13
3.	LANL Wkly Rep.	Constr. Monitoring Drawing		12/20
4.	YMPD	Map - "Soft Rock" Trench Loc.		Undated
5A.	NV Legis. Comm. Mtg.	Agenda		11/12
B.	" " "	NRC's HLW Program	P. S. Justus	"
C.	" " "	DOE's YMP Update	R. Dyer	"
D.	" " "	OR Report	P. S. Justus	12/3
6.	ACNW Meeting	Testing in ESF	N. Z. Elkins	12/13
7.	ACNW Meeting	Map--Nat. Barriers	T. Petrie	12/13
8.	ACNW Tour	Geophysical Invest.	M. C. Tynan	12/15
9.	NAS/NRC Mtng	Agenda		11/9-10

10A. ACNW Meeting	Agenda		12/13
B. ACNW Wrk. Grp.	Agenda		12/14
C. ACNW Tour	Itinerary		12/15
11. ACNW Meeting	Issue Resolutions	A. Gil	12/13

cc w/encl:       R. Nelson, DOE  
                   D. Shelor, DOE  
                   T. Hickey, State Senator  
                   W. Patrick, CNWRA  
                   R. Loux, State, Nuclear Waste Project Office

cc w/o encl:     C. Abrams, M/S 4 H 3  
                   R. Bernero, M/S 6 E 6  
                   S. Gagner, M/S 2 G 5  
                   J. Linehan, M/S 4 H 3  
                   E. O'Donnell, M/S NLS 260  
                   H. Thompson, 17 G 21  
                   B. Youngblood, M/S 4 H 3  
                   G. Cook, Region V  
                   R. Dyer, DOE  
                   A. Gil, DOE  
                   T. Petrie, DOE  
                   J. Martin, Region V  
                   S. Jones, DOE  
                   D. Foust, M&O  
                   R. Leonard, M&O  
                   S. LeRoy, M&O  
                   J. Russell, CNWRA  
                   L. Reiter, NWTRB  
                   D. Bechtel, Clark Co.  
                   L. Bradshaw, Nye Co.  
                   N. Stellavato, Nye Co. OR

**AGENDA****YUCCA MOUNTAIN PROJECT - PROJECT MANAGER'S/TPO MEETING****DECEMBER 16, 1993, THURSDAY****TRW CONFERENCE ROOM 9234**

---

<b>TIME</b>	<b>WHAT</b>	<b>WHO</b>	<b>EXPECTED OUTCOME</b>
9:00-9:15	Welcome & Introductions o Review Agenda	R. Barton	
9:15-10:00	Status of Yucca Mountain Site Characterization Project	R. Nelson	Understand Current Status of Program and Project
10:00-10:15	Status of Design and Construction Effort Supporting the Exploratory Studies Facility (ESF)	W. Simecka	Understand Current Status of ESF Design and Construction Effort
10:15-10:30	Status of Site Characterization Testing Program and Preparation and Approval of Study Plans(SPs)	R. Dyer	Understand Current Status of Testing Program and SPs
10:30-10:45	<b>BREAK</b>		
10:45-11:00	Status of Efforts from the Cost Reduction Steering Committee	G. Vawter	Understand Areas Where Cost Reduction Efforts are Being Focused
11:00-11:15	Yucca Mountain Project Summer Intern Program	D. VanNatta	Understand Plans for the FY 1994 Summer Intern Program
11:15-12:00	ESF North Ramp Testing and Characterization Results from the Starter Tunnel	D. Kessel J. Pott	Understand Current ESF Testing and Characterization Activities
12:00-12:30	Redefinition of the Volcanic Stratigraphy at Yucca Mountain	D. Buesch	Understand the Latest Information on Volcanic Stratigraphy at Yucca Mountain
12:30	<b>ADJOURN FOR LUNCH</b>		

---

# **TPO MEETING**

*PRESENTED BY*  
**ROBERT M. NELSON, JR.**  
ACTING PROJECT MANAGER

**DECEMBER 16, 1993**

ENCLOSURE 1B

# **AGENDA**

- **Affected Units of Government Meeting**
- **Edison Electric Institute Meeting**
- **Test Alcove Update**
- **Upcoming Events**
- **Video - 1993 Year in Review**

# **AFFECTED UNITS OF GOVERNMENT MEETING DECEMBER 10, 1993**

- **Focus of the December 10, 1993 meeting was on public involvement**
- **Two speakers from headquarters discussed the multi-purpose canister program, transportation, and cask development**
- **Discussion of means to involve the Affected Units of Government in site suitability issues**
- **Reviewed YMP's key program milestones for calendar year 1994**
- **Plan to continue dialogues begun with the Affected Units of Government**
- **Discussion of possible broader-based involvement of other affected parties**
- **Next YMP Affected Units of Government on February 10-11, 1994**

**EDISON ELECTRIC INSTITUTE  
DECEMBER 1-2, 1993  
PRELIMINARY EVALUATION**

**Noted Project progress**

- **There are positive indications of DOE/OCRWM efforts to rethink and evaluate alternatives to the current program approach**
- **The high priority placed on getting underground at Yucca Mountain and finishing the main ESF loop is encouraging**
- **DOE is interacting with NRC in a somewhat more proactive manner. This development already seems to be yielding benefits for the Project**

**EDISON ELECTRIC INSTITUTE  
DECEMBER 1-2, 1993  
PRELIMINARY EVALUATION  
(CONTINUED)**

**Noted Project progress**

- **The Planning and Control System (PACS) is finally being used as a management tool as well as a cost and schedule tracking tool**
- **EEI/UWASTE is impressed with DOE/OCRWM's applications of a graded QA approach to the manufacture of the tunnel boring machine**
- **The consolidation of QA support contractors is a positive development**

**EDISON ELECTRIC INSTITUTE**  
**DECEMBER 1-2, 1993**  
**PRELIMINARY EVALUATION**  
(CONTINUED)

**Opportunities for improvement**

- **Nuclear utility industry experience strongly suggests that the vast majority of personnel related to the project should be co-located with the project**
  - **With respect to YMP, this should include DOE, the M&O contractor and other participant staffs**
- **Overlapping and redundant DOE orders area causing unnecessary costs in this program, effecting such things as wide-ranging as applications of strict printing requirements and unnecessary and redundant mining regulations**

**EDISON ELECTRIC INSTITUTE**  
**DECEMBER 1-2, 1993**  
**PRELIMINARY EVALUATION**  
(CONTINUED)

**Opportunities for improvement**

- **The length of time between the ESSE reports is a cause for concern. It does not appear that DOE is utilizing the ESSE and the performance assessment process as a management tool on a consistent basis**
- **Actual execution of issue resolution and closure has been inordinately slow. There seems to be a significant lack of emphasis on actual issue resolution with NRC via recognized methods. The disconnect between the seismic hazard topical report schedule and the ESF schedule is an example of the effect of this inadequate process**
  - **It is unsatisfactory that DOE does not have a current and proactive schedule for issue resolution**

# TEST ALCOVE

- **Excavated alcove to depth of +/- 75 feet**
- **Authorized blasting of two more rounds**
  - **Geologic mapping scientists anticipate getting through the shear zone and providing us with the final depth**
- **Rounds will not be fired until after the new year**
- **Drilling for radial borehole tests will begin immediately following excavation of the last round**
- **Testing and construction community have agreed to fibercrete the roof of the alcove up to the existing face**

# UPCOMING EVENTS

- **NWTRB**  
**Arlington, VA** **Jan. 10-12, 1994**
- **Public Open House Tour** **Jan. 22, 1994**
- **Speakers Series**  
**(Constructing a tunnel**  
**to study a mountain)** **Jan. 25, 1994**
- **National Academy of Science**  
**Standards Meeting** **Feb. 7-8, 1994**

# YUCCA MOUNTAIN NEWS ITEMS

**TODAY'S DATE IS: December 16, 1993**

1. **FEDERAL AID MULLED FOR NUKE WASTE**  
Washington Times, 12/5/93
2. **FROM THE DESK OF YOUR O.T.C.R.**  
Las Vegas Indian Center Newsletter, Fall 1993
3. **MILLER DISMISSES CRITICISM, SAYS HIS RECORD AS GOVERNOR A GOOD ONE**  
Lahontan Valley News, 12/8/93

## **NEVADA NEWSPAPER SOURCES: CIRCULATION:**

Las Vegas Review-Journal	140,269 Daily	208,789 Week
Las Vegas Sun	62,735	208,789
Henderson Home News		16,000
Austin Reese River Reveille		500
Death Valley Gateway Gazette		5,500
Elko Free Daily Press	6,700	
Eureka Sentinel		500
Lincoln County Record		1,500
Mason Valley News		3,850
Moapa Valley Progress		2,800
Pahrump Valley Times		5,500
Record Courier (Gardnerville)	7,000	7,000
Tonopah Times		2,502
Reno Gazette-Journal	60,976	72,398
Carson City Nevada Appeal	10,268	11,480
Sparks Tribune	7,000	10,000
Ely Daily Times	2,392	2,600
Inyo Register		3,000

**For further information or assistance please contact:  
Corey Lieber, Institutional and External Affairs, SAIC,  
phone (702) 794-7246, FAX (702) 794-7623**

# Federal aid mulled for nuke waste

ASSOCIATED PRESS

A4

The Energy Department, slipping on its timetable to develop a nuclear waste storage site, is trying to help utility companies pay for storage of their used reactor fuel, Energy Secretary Hazel O'Leary said.

"There definitely exists some moral obligation" to help utilities that will run out of on-site storage space, she said Friday.

Most reactors store used fuel in pools of water, but by 1998, 20 of those will exceed their capacity, the Energy Department says. That is the year by which the federal government promised to have a temporary national storage site for the highly radioactive fuel.

Congress in 1986 picked Yucca Mountain, Nev., as the most acceptable site for permanently disposing of commercial reactor fuel rods. But the government is surveying its suitability, and the facility is not expected to be ready until 2013, Mrs. O'Leary said.

Ratepayers subsidize a federal fund that is collecting \$600 million a year for the construction of the permanent site.

Mrs. O'Leary said it would be unfair to expect ratepayers to shoulder the cost of building additional on-site storage for used fuel that was destined for the federal facility.

"The number of customers in the United States who will shortly be paying double... is ever-increasing," she said in an interview.

Mrs. O'Leary said she is exploring with state utility commissions and utility companies ways the Energy Department can take on some of the financial burden.



Energy Secretary Hazel O'Leary

# Las Vegas Indian Center Newsletter, Fall 1993

From the desk of your O.T.C.R.

Regarding the Yucca Mountain Site  
Characterization Project

LVIC has been actively involved in the YMSCP since 1989 and you can be assured that the cultural resources for Native Americans are protected under several federal laws such as the Nuclear Waste Policy Act, American Indian Religious Freedom Act, and the National Historic Conservation Act.

The program focuses on American Indian studies and archaeology. Our major objective is to consult with the DOE to determine areas of cultural and historical significance at Yucca Mountain and to protect the physical evidence of our ancestral occupation of the area.

It is the consensus of the 16 Native American tribes involved in the Yucca Mountain Site Characterization Project that all significant cultural resources be protected and preserved in place as they are found. Project archaeologists have identified and preserved several artifacts in the region such as sites where our ancestors resided, arrowheads, hand axes, tingus, petroglyphs and pictographs.

16 Indian tribes have been identified as having cultural and religious ties to the Yucca Mountain region. These 16 tribes are comprised of individuals from three main ethnic cultures, the Southern Paiutes, Western Shoshone, and the Owens Valley Paiute and Shoshone. Other Native American origins are also represented.

We have three American Indian monitors who work in conjunction with archaeologists who study and provide input regarding cultural sensitivities and preservation of artifacts.

The LVIC has established a library of pertinent information regarding the Yucca Mountain Site Characterization Project for your viewing if you so desire.

*"...learn from everyone you meet  
instead of judging them."*

# Miller dismisses criticism, says his record as governor a good one

CARSON CITY (AP) — Bob Miller has governed Nevada for nearly five years, and he says that despite some criticism his record during that tumultuous period has been a good one.

The Democratic governor, facing challenges from his own party as well as from the Republican Party when he seeks re-election next year, has run one of the fastest-growing states in the country since January 1989.

During that time the nation weathered a recession, and Nevada's near-monopoly on legalized gambling deteriorated as other states and Indian reservations got into the casino business.

Miller initially supported large tax hikes, only to find himself having to slash \$173 million in government spending to balance the budget.

The governor boasts of reducing class sizes in first and second grades, and notes the job market has grown 12 percent from

September 1980. And there has been a reorganization of state government.

Nevada's average annual wage, which exceeds the national average, grew to \$24,744 in 1992, up 14.9 percent from 1989. But inflation rose by 17.8 percent.

Hospital billings and electric rates for Las Vegas grew at a faster pace than wages. Auto insurance premiums were up about 13 percent.

When Miller took over in 1989, the unemployment rate was at a record low of 4.4 percent. Now it's above 7 percent and higher than the national average.

Ranks of welfare recipients are up 56 percent, and needy families are staying on public assistance for nearly two years compared with 18 months in 1989.

Nevada's first business tax was imposed during Miller's watch. The sales tax was increased. The state's levy on gasoline rose from 18 to 23 cents a gallon.

During this period, premiums paid by employers to the State Industrial Insurance System jumped more than 40 percent. But unemployment insurance premium taxes remained one of the lowest in the nation.

In education, one of Miller's top priorities, the high school dropout rate has improved but there are mixed results in college admission tests scores of Nevada high school students.

The recession, Miller said, "made it impossible to do some of the things because we had to recognize the first priority was living within our means."

"We've led the country in new jobs, and we've led the country in per-capita income growth. It's been a challenging five years, but it's been a productive five years."

More women, blacks and Hispanics are filling top state jobs under the Miller administration. His own office recently underwent an abrupt transformation from a male-dominated staff to one in which women hold most of the top jobs.

Miller carried on the fight against a high-level nuclear waste dump in southern Nevada. The low-level nuclear waste repository near Beatty was closed.

In 1990, Miller focused on the need for health-care coverage for about 174,000 Nevadans who didn't have insurance. That number has grown to more than 280,000 today.

In 1991, he muscled the hospital industry to freeze rates for one year and then to boost them only by the medical cost of living annually. But the average daily hospital bill has risen 42 percent during his time in office.

There have been apparent about-faces. In 1989, Miller told the Legislature of the need for more prisons. Earlier this year, he sought early release for inmates, some of them considered dangerous, and the closure of most of the prison honor camps.

A bill to allow state workers to bargain collectively was vetoed by Miller. But the governor says he won't cross an informational picket line at the opening of the MGM Grand Hotel and Theme Park.

This year, Miller started a major effort to salvage the State Industrial Insurance System, which was heading for bankruptcy. But it was Miller's appointed board that allowed the system to deteriorate before he personally stepped in.

In 1989, Miller talked of stepping up the attack on drugs and gangs. At that time, there were about 5,000 gang members in Las Vegas. That number is now believed to be closer to 7,000.

The governor said economic diversification efforts have succeeded. But state statistics show the gaming and tourism industry accounts for a greater percentage of jobs now than when Miller took office.

Miller, whose late father was a Las Vegas casino executive, also defends his close relationship with the casino industry.

His administration worked with gaming lobbyists to shape the SINS overhaul bill this year. The outcome saved millions of dollars for big casinos, which are self-insured, because the bill called for a reduction in worker benefits.

Miller's chief aide now is Patty Becker, a former top executive with Harrah's. One of his secretaries, Deana Guthrie, worked several years for gaming lobbyist Harvey Whittemore before she took the job in Miller's office. The governor's top campaign fund-raiser is Frank Schreck, an attorney with many big casino clients.

In regard to the casino business, Miller said, "They are the only industry in the state that has been hit (with taxes) all three times" the Legislature has met during his administration.

The gaming tax was increased in 1989, a business tax was imposed on all companies in 1991, and an exemption for big casino firms was removed in 1993.

The governor said there is only one critic of his gaming ties: Las Vegas Mayor Jan Laverty Jones, who is running against him in next year's Democratic primary election.

Miller also was criticized for mental health cutbacks during 1992, when many clinics in rural Nevada and Clark County were closed.

"Mental health's budget is 50 percent bigger than when I started five years ago," Miller said. "There has been no bigger increase on a percentage basis than in mental health."

If Miller is re-elected, he could serve 10 years — longer than any governor in Nevada history. There is a legal question about whether he is eligible for another term, but that will be settled in the courts.