



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

Reply to:

1050 East Flamingo Road
Suite 319
Las Vegas, Nevada 89119
(Tel: (702) 388-6125
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MEMORANDUM

DATE: July 18, 1988
FOR: John J. Linehan, Acting Chief, Operations Branch
Division of High-Level Waste Management
FROM: Paul T. Prestholt, Sr. DR - NNWSI *PTP*
SUBJECT: NNWSI Site Report - Overnight Mail

Please find enclosed the report for June, without enclosures. The enclosures will be mailed along with another copy of the report as soon as they have been copied.

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M E M O R A N D U M

DATE: July 12, 1988

FOR: John J. Linehan, Acting Chief, Operations Branch
Division of High-Level Waste Management

FROM: Paul T. Prestholt, Sr. OR - NNWSI *PTP*

SUBJECT: NNWSI Site Report for the month of June, 1988

I. QUALITY ASSURANCE

A. Concerning the June NNWSI QA audit of the USGS in Denver, Dr. Larry Hayes, USGS Technical Project Officer (TPO) is challenging a number of the Standard Deficiency Reports (SDRs) that were issued by the audit team. Also, Dr. Hayes is challenging all of the severity level 1 (most severe) SDRs.

The audit team's report has not been issued. Mr. Carl Gertz, WMPO Program Manager, has indicated that no decision on

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the audit team's recommendations will be made until the team's report is finalized.

B. Half of the agenda for the June Project Manager-TPO meeting concerned QA. Three topics were discussed:

- I. Qualification of the Quality Assurance Program;
 - II. A discussion of the audit process as presently used by the NNWSI;
 - III. The revision of the NNWSI QAPPs to match the 88-9 document. The 88-9 is the new designation for the NNWSI Quality Assurance Program Plan.
- I. The definition of a "Qualified Quality Assurance Program" is still evolving. However, the target date for achievement is January 1, 1989.

The following process for the implementation of a fully qualified QA program was presented (from the attached handout)

<u>TASK</u>	<u>SUMMARY OF PROCESS</u>
Project level plans	Process defined by SAIC
Qualification-Certification of personnel	Process defined in WMPO QAPP (88-9 document)
Training	Process to be finalized by Training Management Plan, implementing procedures, and letter of direction from WMPO.
Technical/QA prerequisites	Definition and categorization (new, ongoing) of activities to be

defined from SCP networks by SAIC. List and catalog of QA technical prerequisites to be prepared by SAIC with input from participants, including four sample networks developed for DOE Hq. review.

Prioritization of remaining networks to be established for those beyond the four examples. Networks will be created for each activity showing prerequisites and schedules.

Readiness Review
(option)

WMPO may conduct readiness review(s) to determine whether project is prepared to implement procedures.

The following issues are being actively addressed:

- Integration of project and DOE Hq. efforts, e.g.,
 - What will be provided to NRC and when?
 - What level of detail should be on networks?
 - How will DOE Hq. and project QA documents be made to conform with each other?

- Definition of resources required to complete all actions on time.

- Definition of processes and allowed time periods for document preparation, review, and approval.

- Priority of this activity vs other high priority activities (SCP, ESF).

A schedule for meeting the requirements to implement a fully qualified QA program is included in the handout.

- II. The NNWSI QA program defines an audit as: "A planned and documented activity performed to determine by investigation, examination, or evaluation of objective evidence the adequacy of and compliance with
- established procedures
 - codes and standards
 - instructions and drawings
 - other applicable requirements
- as well as the effectiveness of implementation."

The enclosed handout discusses:

- audit preparation
- the audit cycle
- audit performance
- audit reporting
- audit follow-up
- an example of a WMPD SDR
- the draft procedure review checklist

III. The enclosed handout presents the schedule for the revision of the participants QAPPs to match the 88-9 document. The process started with the transmission of the 88-9 document to the participants on May 25, 1988, and ends (as far as WMPD is concerned) with the transmission of the WMPD reviewed participant QAPPs to OCRWM for review/approval on August 7, 1988.

II. GEOLOGY

A. On June 7, I attended the Sample Overview Committee (SOC) meeting at the new Sample Management Facility (SMF) in area 25, Nevada Test Site. The meeting included a tour of the new facility. The SMF is housed in two buildings. One building houses the offices, sample preparation rooms, sample viewing room

and storage. The second building will be used for storage. The set-up is very impressive.

The transfer of core from the USGS Mercury (NTS) facility to the SMF is continuing. This activity is expected to be completed by the end of the calendar year. The procedures for the operation of the SMF have been written and are under review by the QA organization. It is not expected that the SMF will be open for business before September and it is more likely that it will be October or November.

Enclosed is a copy of the charter for the SOC and AO-SOC-1, "Approval Procedure of Request for NNWSI Project Geologic Samples." These documents are in draft, they are not finalized and are submitted only to show the direction the NNWSI project is going.

B. The problem of qualifying the core (samples) from the boreholes drilled to date for QA level 1 activities is continuing to get priority attention. WMPO sent a letter to each participant asking that they indicate which samples in their possession (borehole number and depth) were essential to QA level 1 activities. The answers to that letter are enclosed.

The positions of the participants on the need to qualify existing samples is summarized in a document titled "Need for the Qualification of Existing Drillhole Samples." Because of the importance of this problem, I'm reproducing the total document:

NEED FOR THE QUALIFICATION OF EXISTING DRILLHOLE SAMPLES

POSITIONS OF THE PARTICIPATING ORGANIZATIONS ON THE IDENTIFICATION OF EXISTING NNWSI PROJECT DRILLHOLE SAMPLES THAT MAY BE USED TO SUPPORT LICENSING DOCUMENTS: RESPONSES TO A LETTER (DTD. 5/2/88) FROM C. GERTZ-WMPO/PM TO THE TPOS

U.S. GEOLOGICAL SURVEY:

Initial Response

"Virtually all of the existing core and bit cuttings were used in the preparation of lithologic logs which were published or will be published in drillhole basic data reports. These data reports, in turn, have been and will continue to be used and referenced in our interpretative reports, position papers, and NNWSI Project licensing documents. We cannot determine that any specific sample will or will not play a part in the licensing process. In fact, every existing sample is susceptible for selection as the basis for some scientific interpretation, analysis or conclusion that can be used in support of, or against, licensing. Therefore unless you intend to exclude all USGS drillhole basic data reports from the licensing process, all drillhole samples, including core, cuttings and water from either the saturated zone or extracted from rocks of the unsaturated zone, should be considered as candidates for qualification".

Revised Response

"The two major stratigraphic intervals that we have selected are the Topopah Spring Member of the Paintbrush Tuff and the tuffaceous beds of Calico Hills. The intervals include the host rock and the potential barrier between the repository and the water table, respectively. Characterization of samples from these intervals are considered a high priority. Other considerations are intervals that include contacts between subjacent stratigraphic units, which help establish the primary geometric configuration of the repository area.

"We have included only continuously cored holes in this selection process. Although all holes where geophysical logs and bit-cutting samples have been collected represent an integral subset of data for establishing the geologic framework of Yucca Mountain, continuously cored holes have provided the fundamental reference data set, from which reliable lithologic and geophysical correlations are made.

"Coreholes that penetrate the above mentioned stratigraphic units within or near the area enclosed by the perimeter drift are presently considered more important for later use in licensing interactions and are given a higher priority."

LOS ALAMOS NATIONAL LABORATORY:

"Key intervals from specific cores can be identified for the alteration history and tracer evaluation studies. However, our work on the mineralogy of transport pathways and fracture mineralogy requires characterization of all units across the repository block and along potential ground water flowpaths to the accessible environment. To do this, a complete three-dimensional picture of the mineral distributions at Yucca Mountain must be constructed. We feel that use of limited subsets of existing data will not be adequate to document the many changes in mineralogy that occur vertically and laterally at Yucca Mountain."

Attachment 1 (Enclosed) - Provides a list of boreholes, identification of analysis completed, accuracy, and sensitivity of sample depth and location, and estimates cost and time to duplicate tests.

Attachment 3 (Enclosed) - Draft Report by Broxton, Byers, and Warren proposing and compiling information for a possible peer review of data from nine boreholes; six are the same as proposed by the USGS.

SANDIA NATIONAL LABORATORIES:

"Existing data and data from ongoing activities with 'unqualified core' may, as necessary, be used as supporting or corroborating information in the licensing process. Our plans for obtaining primary data require samples from new coreholes at Yucca Mountain and most of our requirements are for samples from locations that have not been previously cored. Therefore, we cannot identify a specific subset of existing core that, if qualified, would significantly change our requirements as expressed in the SCP. If the planned drilling were greatly reduced, the reduction might force us to attempt to use existing core for gathering future primary data. The nature of such reduction would dictate our specific qualifying requirements".

LAWRENCE LIVERMORE NATIONAL LABORATORY:

"Although we have received core or cuttings samples from various depth intervals in eight drillholes on or near Yucca Mountain and have used some of the material in experiments, none of these samples need be qualified if repository horizon samples become available in a timely manner."

SUMMARY OF POSITIONS:

The positions range from:

1. All of the existing core/cuttings should be considered for qualification because much of the data derived from drillhole samples (e.g., subsurface stratigraphy) has already been released in reports which will be referenced in licensing documents. This position was subsequently modified to include only the major subset or data from continuously cored holes penetrating the Topopah Spring Member of the Paintbrush Tuff and the Calico Hills tuffaceous beds. Coreholes within or near the perimeter drift are of most importance.
2. Perhaps none of it will need to be qualified. The latter position intends that new core will meet all of the Project requirements toward resolving licensing issues, but with the caveat that time constraints (e.g., the need to meet Project deadlines) or restrictions on drilling in the repository block (e.g., number of holes and/or depth of holes) might create a need for qualifying some drillhole samples.

ISSUES TO BE RESOLVED PRIOR TO THE RECOGNITION OF A SUBSET OF EXISTING CORE SAMPLES FOR QUALIFICATION

1. FINALIZATION OF THE DRILLING PROGRAM AT YUCCA MOUNTAIN: What restrictions on number of holes or their depth will be placed on the Project? For example, no drilling below the water table may mean that all core from the Crater Flat Tuff will have to be qualified. Does the present Drilling Program reflect the possibility that existing drillholes might not be part of the primary data set?

2. SCHEDULING IMPACT: What will be the impact on the present schedule if the existing data derived from drillhole samples can not be used as primary data and some tests and experiments must be duplicated? These experiments and the related core/cuttings samples would have to be identified. It has been suggested that delays up to five years (e.g., sorption experiments) may result.

PROCEDURES AND FACILITIES REQUIRED FOR A QUALIFICATION EFFORT

1. STATUS OF THE CORE TRANSFER: For any technical study of the actual drillhole material preparatory to a qualification effort the drillhole samples will have to be in storage at the Sample Management Facility (SMF). The transfer is in progress and core/cuttings from 16 holes has been moved to the SMF. The projected completion of this activity is late 1988 to early 1989.

2. STATUS OF THE SAMPLE MANAGEMENT FACILITY: This facility must be operational prior to any work on the existing material (e.g., relogging of selected intervals or the preparation of gamma logs from core). SMF technical procedures and administrative procedures are in formal review. Computer software is being developed, however, the establishment of a 56 kilobit communications link for the full operation of the SMF computer system and the software has not been resolved. The software will have to be reviewed and approved.

3. STATUS OF AP 5.9Q QUALIFICATION OF DATA OR DATA INTERPRETATIONS (EXISTING DATA) NOT DEVELOPED UNDER THE NNWSI PROJECT QA PLAN: The AP is under formal review. It is important to the qualification of existing core because it establishes a cutoff date for NNWSI Project produced existing data as being data generated before the QA Level assignment to the activity (AP 5.9Q replaces NNWSI Project SOP 03 03 which defines existing data as data generated prior to the August 1980 version of the NNWSI Project QA Plan and therefore eliminates much of the core from the existing data category). Also AP 5.9Q utilizes the four methodologies for qualification described in the NRC Generic Technical Position Paper on the "Qualification of Existing Data". These four methodologies and examples of their application to the drillhole data are listed below.

Corroborative Data: A comparison of the petrology of samples collected from stratigraphic sections at the surface and from

the ESF sample sites with existing drillhole samples is an example.

Conformatory Testing: The application of geophysical logs from the existing drillholes to the recognition of stratigraphic units defined initially on the drillhole lithologic logs is an example.

QA Program: An activity controlled by procedures similar to a 10 CFR 50 Appendix B Program might be the documented acceptance procedures and detailed technical procedures used in the geophysical logging of NNWSI Project drillholes. These may be sufficient to qualify the drillhole stratigraphy.

Peer Review: A panel of experts external to the project who would review a protocol put together by the NNWSI Project. This protocol would be a plan covering the technical methods and document analyses required for the qualification of the existing drillhole data.

PROPOSED WORKING GROUP

The purpose of this group would be to assemble and evaluate documents and technical methodologies in support of the qualification of existing data utilizing the guidelines in AP 5.9Q. This group would develop a protocol for qualifying existing core/cuttings and related drillhole data to be used as primary data in licensing documents. Its members would be drawn from the Sample Overview Committee, Project Regulatory Compliance (Licensing) and Quality Assurance.

III. HYDROLOGY

The activities of the USGS hydrologists, working out of test cell "C", Area 25 of the NTS, are the same as noted last month.

IV. GEOCHEMISTRY

In Los Alamos National Laboratory's answer to the WMPO letter concerning the qualification of core, LANL states:

Use of Existing Core for Licensing

"Most of the studies for geochemistry require that we characterize all units across the repository block and along possible transport pathways to the accessible environment. Single key intervals used in these studies cannot be identified. We need all data obtained to develop a three dimensional model of Yucca Mountain. The studies do fall into two groups, however and these can be discussed separately.

"The least restrictive (in terms of core identification) studies that we do are essentially generic. It is not necessary to independently identify the core or interval from which the sample came. The core is characterized using XRD, XRF and petrographic microscope description of thin sections. From this information it can be determined what unit, and often what lithologic interval within the stratigraphic unit is present. The results are tied to lithology, mineralogy and chemistry. To demonstrate the appropriateness of the results to Yucca Mountain it need only be demonstrated that the lithology, mineralogy and chemistry of the samples used in these studies match the intervals of interest at Yucca Mountain. Samples can be taken from future drill core or the exploratory shaft as appropriate to demonstrate this relationship.

Studies that fall into this category are sorption studies and glass dehydration studies. For some of the sorption studies natural state samples have been used, and if those are accepted as QA Level-1 they will provide additional tie points to Yucca Mountain, but this should not be necessary for acceptance of the data for licensing.

"The second category is the one that most Mineralogy-petrology studies fall under. Waxed core has not been used in these investigations. Key samples cannot be identified as it is necessary to characterize sorptive barriers along hydrologically transmissive zones across Yucca Mountain. Identification of the borehole from which the samples came is necessary. Vertical control to within ± 50 feet is desired. If waxed core is accepted as QA Level 1, selected pieces could be analyzed to corroborate existing data for some activities, but probably would not be of much use for fracture mineralogy. Many samples are examined and interpretations are based on a suite of samples rather than single occurrences. Misplacement of one or two samples would have no effect on results. Interpretations are tied to lithology and stratigraphy (independently determined) as well as depth. Data collected is internally consistent within stratigraphic intervals and between drill holes. Discussion of internal consistency is contained in the report by Broxton et al. (milestone T095, copy enclosed)."

Also contained in the handout is a copy of:

"Petrography and Phenocryst Chemistry of Volcanic Units at Yucca Mountain, Nevada: A Comparison of Outcrop and Drill Hole Samples" by D. E. Broxton, F. M. Byers, Jr., and R. G. Warren.

V. REPOSITORY ENGINEERING

Both Fennix and Scisson and Holmes and Narver are continuing to work on resolution of comments resulting from the 50% Title I design review.

VI. WASTE PACKAGE

Lawrence Livermore National Laboratory is looking at the implications of DOE's revised definition of "Substantially Complete Containment" as it applies to the waste package. The revised definition is in response to NRC comments on the SCP/CD.

VII. PERFORMANCE ASSESSMENT

The work being performed in the area of performance assessment is centered around finalizing the SCP and writing study plans. I'm not aware of any new work in this area.

VIII. SITE ENVIRONMENTAL ACTIVITIES

The project is still waiting for air quality permits before starting work on test pits at Fran Ridge. I'm not aware of any new work in this area.

IX. LICENSING AND NRC-DOE INTERACTIONS

A. During June, three Yucca Mountain Project update meetings were held for the public by DOE and the State of Nevada. On the 6th, the meeting was held in Amargosa Valley, Nye County; on the 7th the meeting was held in Las Vegas at the Aladdin Hotel; and on the 9th, the meeting was held in Reno. The State of Nevada did not participate in the Amargosa Valley meeting. However, Mr. Loux and his staff were present and did participate in the Las Vegas and Reno meetings. I attended the two southern Nevada meetings but I did not go to Reno.

The presentations were divided into four parts; introduction, transportation, earth science and socioeconomics.

The DOE presented first with the State following. Each of the four parts were completed in turn.

The presentations were designed to answer those questions most asked by members of the public. Some examples are:

- o Why Nevada?
- o When would a repository be built?
- o What's going on now at Yucca Mountain?
- o Why should we believe what DOE says?
- o Would the repository be safe?
- o Transportation questions concerning routing of waste shipments, safety of shipments including safety checks (who makes them, who is responsible?), accident prevention, emergency response (who pays for), and cask design.
- o Socioeconomic questions including employment, expenditures (how much will it cost and who pays for it?), and potential impacts on local infrastructure and tourism.
- o Earth sciences including geology, hydrology and plans for site characterization.

A handout is enclosed.

Approximately 60 people attended the Amargosa meeting. Major concerns expressed by the citizens include:

- o Nye County wants more NTS/repository jobs. More access to union jobs. This was the number one priority.

- Bus service to be made available from other Nye County communities. Presently there is bus service from Pahrump. It was also suggested that the subsidy to the bus company be eliminated to make residency in Nye County more attractive. Most NTS workers live in Las Vegas, Clark County.
- Make emergency services available if an accident occurs.

About 200 people attended the meeting at the Aladdin Hotel in Las Vegas. Many of the attendees were DOE employees. The major concerns expressed by the public at this meeting were:

- Siting issues surrounding the repository.
- Reprocessing of waste.
- Transportation routes.
- Evacuation plans for the Las Vegas Valley should there be an accident.
- Terrorism concern.

In Reno, only about 60 people attended. Major concerns expressed include:

- Shoshone Indian land rights at Yucca Mountain.
- Nationwide hearings on transportation routes.
- Volcanic activity near Yucca Mountain.

B. On June 7th, I attended the Sample Overview Committee (SOC) meeting at the new Sample Management Facility (SMF) and participated in a tour of the SMF. This is a very impressive facility.

C. On June 9th I attended a meeting of the Licensing Support System (LSS) at the request of Chip Cameron, NRC attorney. The basic purpose of this meeting was to demonstrate for the State of Nevada what types of "raw data" are being generated by NNWSI participants. Presentations were given by the USGS, Sandia National Laboratory, Los Alamos National Laboratory and SAIC. Examples of raw data and the instrumentation used to obtain it were set-up as displays.

The State indicated that they were satisfied with the demonstration. The agenda and attendance list are attached.

Because of my involvement in the June 9th LSS meeting, I was asked to attend the June 29-30 LSS meeting in Reno, Nevada, to help in resolving the "raw data" question. This is only one part in obtaining an agreement on the wording of the proposed NRC rule concerning the LSS. The State of Nevada wrote, and proposed for inclusion in the rule, a paragraph describing how "raw data" would be handled in the LSS. The wording of the State's proposal was modified and the document was given to all parties for consideration.

D. During the week of June 13-17 I attended the American Nuclear Society (ANS) meeting in San Diego, California. The meeting concluded on the 16th.

The ANS is a Nuclear Industry Organization. The waste disposal problem has become important enough to the nuclear industry that a session dealing with the waste problem was scheduled for each time period. The sessions were very well attended.

Considering that much of the audience was not directly involved with the repository program, it isn't surprising that the subject matter was presented in a rather basic way. The biggest disappointment to me was the presentation of performance assessment. To me, there was no indication that the different

people and organizations working on this problem are coordinating their efforts. This could be the result of the way the subject was presented. I hope so.

Enclosed is a copy of the agenda and a description of the sessions concerned with the waste problem.

E. On June 28, I conducted a tour of the Test Site for Ms. Joyce Amenta, Deputy Director, Information Resources Management and Mr. Avi Bender. We visited "G" tunnel, Sedan Crater, and Yucca Mountain.

F. On June 6th and 20th I met with Mr. Carl Gertz, WMPO Manager. General subjects of interest were discussed. On the 20th, I was introduced to Mr. Ed Wilmot, Mr. Gertz's new Deputy Manager.

G. Enclosed in a handout from the June TPO meeting held on July 5, is the latest WMPO organization chart. In presenting this chart, Mr. Gertz emphasized that WMPO would soon be reorganized and that this organization chart would be obsolete.

X. SCP AND STUDY PLANS

During the June TPO meeting, it was mentioned that there are two new sections to Chapter 8 of the SCP planned. It was stated that this could run to 500 new pages.

Review and comment resolution workshops with DOE Hq. are scheduled for July 25 through August 19. These workshops are scheduled to be held in Las Vegas. Final production is to start on September 9.

Final DOE Hq. concurrence review is scheduled for October 24 through November 4. Printing is scheduled between November 21 and December 26 with public release December 28.

Enclosed is a handout and a network for SCP completion.

XI. STATE INTERACTIONS

There were no State interactions except as noted elsewhere in this report (LSS meetings, ANS meeting, public meetings).

XII. MISCELLANEOUS

DOE-WMPO is starting a long range planning effort. The week of July 11 is scheduled for the kick-off. The effort is scheduled to be completed in December. An enclosed handout outlines this effort.

Also enclosed is an evaluation of project level management plans. The handout shows how the Project Management Plans relate to the Project Plan and the status of the writing of the management plans.

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

No enclosures: C. P. Gertz, R. R. Loux, M. Glora,
D. M. Kunihero, R. E. Browning, G. Cook,
L. Kovach, S. Gagner, K. Turner

Enclosures: Evaluation of Project-Level Plans Background; Long Range Planning Effort Status; Schedule for SCP Completion; Status of SCP Completion; Agenda, 7/5-6/88 TPO Meeting; TPO Presentation by Carl Gertz, 7/5/88; Excerpts from Transactions, American Nuclear Society Meeting, 6/12-16/88; Licensing Support System Advisory Committee - Participants Meeting on Raw Data, 6/9/88; Yucca Mountain Project UPDATE MEETING, 6/88; Responses to the WMPO core letter; Core Strategy Options; Charter for the Sample Overview Committee; Informal Input, NNWSI Project, Administrative Procedure; Informal Input, Boreholes Inventoried at USGS Library through 6/7/88; Revision of Participants QAPPs; Audit definition; Procedure Review Checklist; Schedule for Meeting Requirements to Implement a Fully Qualified QA Program; QQAP