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

Reply to:
1050 E. Flamingo Rd., #319
Las Vegas, Nevada 89119
Tel: (702) 388-6125
FTS: 598-6125

MEMORANDUM

DATE: August 15, 1990

FOR: John J. Linehan, Director, HLPD, Division of High-Level Waste Management, M/S 4 H 3

FROM: John W. Gilray, Sr. OR - YMP

SUBJECT: YMP Site Report for the month of July, 1990

I. QUALITY ASSURANCE

A. QA Organization Change

The newly appointed OCRWM Director of the Office of Quality Assurance, Don Horton, will also be acting in his old position, the YMP QA Division Director, until this latter position is filled. It is expected that this position may be filled in approximately three months. Don Horton therefore will be commuting extensively between the DOE Hqts office in Washington, D.C. and the YMP office in Las Vegas in order to carry out his responsibilities in these two positions. Don Horton has appointed R. Lahoti as the Hqts QA Division Director who will be responsible for the Hqts QA program and activities including the QA program and activities for the waste form package at Savannah River, West Valley and Richland.

B. QA Audit of the DOE Hqts and YMP QA Program

OCRWM has decided to conduct an audit from October 15 through 31, of the DOE Hqts and the YMP overall QA programs and implementing activities. Particular emphasis will be placed on the quality related activities, procedures and records which pertain to the Midway Valley trenching and Calcite Silica investigation areas. The audit is expected to cover all 18 QA elements of 10 CFR 50, Appendix B. The purpose of this audit is to determine if sufficient QA controls are in place and that sufficient implementation of the QA program has been accomplished to warrant the overall QA program acceptable and to allow the start of new site characterization work in the areas of Midway Valley trenching and calcite silica investigation. This audit is expected to last at least two weeks since it will involve audit activities at DOE Hqts, Washington, D.C. and at the YMP, Las Vegas. This office has encouraged Carl Gertz and Don Horton to submit the audit plan to NRC and the State of Nevada well in advance of the audit to allow sufficient time to resolve any comments resulting from their reviews.

C. Q-Lists and Quality Activity List

The YMP has officially released for use within the project, including the participants, two controlled documents listing those items important to safety and important to waste isolation (YMP document YMP 90-55) and a listing of those quality related activities (YMP document YMP 90-56). A copy of these two documents are enclosed with this report (Enclosure 1). As suggested in the last report it may be of benefit to the NRC to have the YMP provide a presentation on the development, control and use of these two lists and describe the QA grading process.

102

NF-74-75

D. Audits and Surveillances

The YMP conducted the following surveillances in July and early August on the following participants:

LANL from July 9 through July 13. The surveillance team identified one standard deficiency which pertained to LANL's poor attitude and lack of attention to adequately identify and implement corrective actions in a timely manner. The YMP considers this a serious issue and is taking action with LANL management to resolve this concern. The surveillance report will be submitted to NMSS (K. Hooks) by this office when it is released.

T&MSS from July 16 through July 20. The surveillance team identified four standard deficiencies which were mainly related to procedural problems. Overall the team concluded that the T&MSS QA program was acceptably being implemented. The surveillance report is in preparation. A copy will be transmitted to NMSS (K. Hooks) by this office when it is released.

LLNL from August 6 to August 10 covering criteria 2, 5, 6, 16, and 17. The YMP determined that the LLNL QA program was being implemented properly in these selected areas. The YMP surveillance is in preparation. This office participated as an observer of this surveillance and found the surveillance useful and effective. The observation report (draft) has been submitted to Ken Hooks for review prior to release.

SNL from July 9 through July 12. The surveillance team identified three standard deficiencies associated with the lack of procedural controls for identifying what records are to be kept under the control of their QA program and the failure to initiate and respond to corrective actions in a timely manner. The surveillance report will be submitted to NMSS when released.

The YMP conducted an audit of USGS quality related activities at the Denver, Colorado facility from June 25 through 29, and at the Nevada Test Site from July 2 to July 3. As a result of this audit the YMP audit team determined that the USGS QA program was effectively being implemented except in the areas of training, nonconformance control and records. The audit team identified nine standard deficiencies which in their opinion collectively did not represent a significant breakdown in the QA program, but did recommend USGS management to get involved with these issues to assure proper attention is devoted to correcting the deficient areas. The audit team recommended that in-depth USGS internal surveillances and audits be performed to gain confidence that the corrective actions taken by management to resolve the deficiencies are accomplished and effectively implemented.

The YMP plans to conduct surveillances at SAIC from August 27 through 31, at the Project Office and T&MSS from August 20 through 24, and at USGS from September 20 through 14.

Also the YMP plans to conduct audits at SNL from August 20 through 24, and at F&S from September 24 through 28.

II. WASTE PACKAGE

The LLNL monthly status report for the month of July is enclosed (Enclosure 2). Also a copy of the July 1990 "Bibliography of Radioactive Waste Management Publications at Lawrence Livermore National Laboratory is enclosed for information and use (Enclosure 3). It is encouraged that comments and/or questions regarding the contents of these reports be directed through this office for action and resolution in order to minimize the impact on the YMP.

As a result of the recent OCRM/YMP reorganization this office is experiencing a more cooperative spirit, openness and willingness by the YMP staff to bring forth and share more details on the status, policies and strategies of program activities. In this respect future monthly reports should be more informative and useful to the NMSS staff.

There are no new issues that this office has identified that have not been brought to management's attention.

cc: w/encs: K. Hooks, M/S 4H3; J. Bunting, M/S 4H3; J. Latz
wo/encs: R. Stein, C.P. Gertz, R.E. Loux, M. Glora, G. Cook, D.M. Kunihiro, D. Weigel, R.E. Browning, M/S 4H3; H. Denton, M/S 17F2; R. Bernero, M/S 6A4; H. Thompson, M/S 17G21; S. Gagner, M/S 2 G5; L. Kovach, M/S NLS260

Enclosure 2.

Lawrence Livermore National Laboratory

LLYMP 9008002
July 31, 1990

WBS 1.2.9
"QA: N/A"

Carl Gertz, Project Manager
Department of Energy
Nevada Operations Office
Yucca Mountain Project Office
P.O. Box 98518
Las Vegas, Nevada 89193-8518

SUBJECT: Yucca Mountain Project Status Report - July 1990

Attached is the July Project Status Report for LLNL's participation in the Yucca Mountain Project.

If further information is required, please contact Deborah A. Kiraly of my staff at FTS 543-4571.

Sincerely,

Leslie Gardine /for
Leslie Gardine
LLNL Technical Project Officer
for YMP

LJJ/DK/dk

cc:
Distribution

DISCLAIMER

The LLNL Yucca Mountain Project cautions that any information is preliminary and subject to change as further analyses are performed or as an enlarged and perhaps more representative data base is accumulated. These data and interpretations should be used accordingly.

LAWRENCE LIVERMORE NATIONAL LABORATORY
(LLNL)
YUCCA MOUNTAIN PROJECT (YMP) STATUS REPORT

JULY 1990

1.2.1 SYSTEMS

1.2.1.1 Management and Integration

Four draft guidelines to implement the Software Quality Assurance Plan (SQAP) are undergoing internal review.

Staff provided LLNL records on core that was received from boreholes USW G-4 and UE 25a#1.

1.2.1.2.4 Systems Engineering Implementation

Staff met with Bob McKee of PNL in Las Vegas on July 10 to discuss the impact of fuel age on repository design. The meeting served to resolve YMP comments on the PNL draft report.

A staff member participated in the Systems Engineering training class in Washington, DC on July 23-27. The class was organized by DOE-Headquarters.

1.2.1.4.2 Waste Package Performance Assessment

Work is beginning to incorporate corrosion models into the performance assessment models.

Formal Interface discussions with the Container Material and Near Field technical areas are ongoing.

Staff reviewed a draft report by NRC entitled "Phase 1 Demonstration of the Nuclear Regulatory Commission's Capability to Conduct a Performance Assessment for a HLW Repository."

Staff re-reviewed a draft PNL-PASS report entitled "Yucca Mountain Candidate Site Preliminary Postclosure Risk Assessment." Most LLNL comments on previous draft were not addressed.

LLNL organized and hosted a workshop on July 26 on human intrusion scenario development for the YMPO performance assessment activity.

1.2.1.4.5 Geochemical Modeling and Data Base Development

Testing of the new data files with the EQ3/6 codes has continued. All known data base errors have been resolved. Several problems in the software have also been fixed. The user interfaces have been simplified, mainly to remove certain inputs that had become obsolete or posed the possibility of improper usage by users. The documentation was accordingly updated. Testing is now continuing by constructing and running additional EQ6 test inputs. These will be added to a controlled set of such input files.

1.2.2 WASTE PACKAGE

1.2.2.1 Management and Integration

Staff held discussions with SKB about participation in the hard rock lab. Previously determined alternatives are being ranked.

Staff attended the Sample Overview Committee meeting in Las Vegas on July 13.

Three staff members (C. Bruton, B. Viani, and K. Knauss) were identified to participate in the Radionuclide Absorption Workshop scheduled for September 11-12 in Los Alamos.

Two staff members (D. Chesnut and J. Yow) were identified to participate in the Groundwater Characterization Program. The group will meet in late August or September.

Dale Wilder responded to the request for a representative to the Technical Review Board being formed to select the design contractors for the Integrated Data System. He will attend when available.

1.2.2.2 Near Field Environment Modeling and Testing

An outline was produced for the Near-Field Environment report.

Chemical and Mineralogical Properties of the Waste Package Environment

Developing additional input to the working group on volcanic scenarios, emphasizing geochemical concerns.

Finalized, with LANL, plans and schedules for coordination activities. Attended a meeting with representatives from YMPO and LANL.

The following TIPs are complete and awaiting LLNL-YMP QA approval:

TIP-YM-4, Preparation of Standards for the Determination of Trace Elements in J-13 Well Water by ICP-OES,
TIP-NF-18, Testing Rock-Water Interactions Using a Rocking Autoclave,
TIP-NF-16, Preparing Core Wafer Samples,
TIP-NF-17, Carbonate Analysis with the OIC Model 524D Carbon Analyzer, and
TIP-YM-7, Operation of the Jarrel Ash 975 Atom Comp ICP-OES.

Staff prepared an abstract entitled "Geochemical Modeling of Water/Clinoptilolite Interactions," for submission to the Geology Society of America Annual Meeting to be held in Dallas, Texas on October 29-November 1, 1990.

Hydrologic Properties of Waste Package Environment

Continued fracture healing studies and suction potential measurements of G-Tunnel tuff.

Staff presented the paper "Hydrologic Impacts on Waste Isolation Yucca Mountain Prospective Repository Nevada" to the US/USSR Joint Conference on Environmental Hydrology and Hydrogeology in Budapest, Hungary, June 25-29.

Incorporated final review comments for the LLNL paper, "Temperature Measurements for the Engineered Barrier System Field Test." It will be submitted to YMPO for approval.

Mechanical Attributes of the WP Environment

Started outline of tests to determine effect of radiation on mechanical properties.

Answered NRC Site Characterization Analysis (SCA) comment #17 regarding radiation effects. The answer will be merged with the other comment responses (WBS 1.2.5).

EBS Field Tests/ESF Test Design

Work continues on the stand alone reports for the G-Tunnel prototype test. They are being submitted to a TID editor for publication as a formal LLNL report (50,000 series UCRL).

Staff reviewed the Memorandum of Understanding and the test description for the ESF design.

Responded to requests from Hemi Kalia for input to Draft ESF Test Descriptions Document.

The LLNL paper, "In Situ Changes in the Moisture Content of Heated Welded Tuff Based on Thermal Neutron Measurements," has been revised incorporating all technical review comments. It has been submitted for LLNL approval prior to being sent to YMPO.

The LLNL paper "Air Injection Field Measurements to determine the Effect of a Heat Cycle on the Permeability of Welded Tuff" was sent to the technical reviewers.

A staff member attended the ESTP Meeting in Las Vegas on July 19.

1.2.2.3 Waste Form and Materials Testing

Waste Form Testing - Spent Fuel/Glass

Staff met with Karl Notz of Oak Ridge National Laboratory (ORNL) on June 26 in Seattle to discuss the Spent Fuel data base maintained at ORNL and our joint activities. Program guidance to ORNL from DOE was also received documenting the ORNL support to LLNL-YMP.

The MCC meeting in Seattle on June 27-28 was the first such meeting attended by fuel vendors. They were not knowledgeable about issues relating to the spent fuel waste form behavior in a repository. Westinghouse and General Electric agreed to furnish fission gas release information. This information is important because it is indicative of the available radionuclide inventory's fragment and gap surface areas. The fission gas released from the fuel adds to the internal pressure that is the driving force for cladding failure.

James Cunnane of Argonne National Laboratory (ANL) provided a summary of the June 14-15 Technical Exchange Meeting that was held at ANL. A draft position paper was also submitted for review and comment on the linkage between the Waste Acceptance Preliminary Specifications (WAPS) and the waste glass performance in a repository. Staff reviewed the documents and returned comments.

Integrated Radionuclide Release

Development of the ability to analyze lanthanide elements at low concentrations in glasses and glassy rocks continued. Low La, Ce, Nd and Pr abundances were measured with the Cameca IMS 3F in three SRM glass samples. The response appears linear; however, values are not well enough known in the 0.02 ppm and 1.0 ppm standards. Better standards must be obtained and software developed to correct for interferences in the lanthanide region.

Data for lanthanide elements in NIST (formerly NBS) standard glasses were requested; no certified analyses are available.

Congruence of results with three techniques (INAA, SIMS, and ICP-MS) is the NIST protocol for certifying standards. The three techniques are Instrumental Neutron Activation Analysis (INAA), Secondary Ion Mass Spectroscopy (SIMS), and Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). Arrangements were made to get INAA analysis of LLNL samples. Samples of Standard Reference Material (SRM) glass were submitted for ICP-MS analysis of lanthanide elements and other trace elements as part of an intercalibration with the SIMS technique. Arrangements were also made to obtain samples of standard basalt glass from Washington University. As a result of these efforts, defendable standards are expected to be in hand soon.

Ways to incorporate various data algorithms into existing software were explored for modeling concentration vs. depth profiles obtained with the Cameca ion microscope. A mini-class in running the Cameca IMS 3F was conducted.

The stirrer design for the diffusion cells was modified, and stirrers were constructed. A temperature probe and recorder were obtained from instrument loan to better monitor the diffusion cell temperature. A non-toxic dye was identified and obtained; leak tests were postponed due to problems with the spectrometer needed for detection.

Polished fuel pellets, alloys, glasses, and tuff wafers were received and mounted for ion implants. Four tuff cup samples were polished, mounted, photographed, and set up for step scans. Others are still being subcored.

An abstract entitled "Mineralogical, Textural and Compositional Data on the Alteration of Basaltic Glass from Kilauea, Hawaii to > 300°C: Insights to the Corrosion of a Borosilicate Glass Waste-Form" was prepared for submittal to the Materials Research Society symposium on the Scientific Basis for Nuclear Waste Management to be held November 26-29 in Boston.

Staff participated in the American Geophysical Society Spring meeting and presented the paper "Hydrothermal alteration of basalt from the Hawaiian Geothermal Project, Well A".

Thermodynamic Data Determination
No significant activities.

1.2.2.3.2 Container Materials Modeling and Testing

A series of pitting tests on candidate materials at 50°C with variable pH and chloride has begun. These tests will complement the recently completed room temperature tests.

Technical review was completed on the LLNL report on Container Material Selection Criteria.

Staff participated in the DOE Technical Review Group Meeting for Defense and West Valley Waste Acceptance Specifications on June 26 in Salt Lake City.

1.2.2.4 Waste Package Design

A brainstorming session on robust package designs was held.

A subcontract was placed with Brookhaven National Laboratories (BNL) to provide support in modeling releases of carbon-14 from waste package containers under various repository conditions. This work will be completed before Oct. 1, 1990.

The June 27-28 surveillance of Babcock and Wilcox (Container Fabrication and Closure Process Development) by LLNL concluded that B&W has done an excellent technical and QA job. There were no surveillance findings. B&W is working towards production of a closeout report and turnover of all records and hardware associated with their subcontract by September 30.

The Spent Fuel Receipt Scenarios Report was forwarded to YMPO for acceptance on July 17.

1.2.5 REGULATORY AND INSTITUTIONAL

1.2.5 Regulatory and Institutional

NRC Interaction Support
Staff participated in the NWTRB dry run in Denver on July 31-August 1.

Planning meetings are being held to integrate/coordinate the speaker topics for the NWTRB Engineered Barrier System Panel meeting which will be held in Pleasanton, CA on August 28-29.

Staff reviewed the NRC Staff Paper on Performance Assessment for YMPO.

Researching the basis for the 1-3 cm thick container in response to a query from the NWTRB (Dr. Verink).

Performance assessment staff participated in a YMPO preparatory meeting on July 19 and a DOE and NRC technical exchange on July 27 at the NRC Offices in Rockville, MD. The topics were DOE's performance assessment planning documents and the NRC's draft performance assessment report.

Site Characterization Program

Staff participated in the Integration Group (IG) meeting on Site Characterization Analysis to discuss comment resolutions on July 31 in Las Vegas.

Regulatory Review

No significant activities.

Study Plan Coordination

Staff reviewed the USGS Study Plan on "Vertical and Lateral Distribution of Stratigraphic Units within the Study Area."

Staff provided input to YMPO for the Hydrology Organization Charts from our draft Study Plans.

Semiannual Progress Reports

No significant activities.

1.2.9 PROJECT MANAGEMENT

1.2.9.1 Management

Provided YMPO with an updated QA Grading transition plan.

Provided YMPO with a tentative list of papers for the April 1991 HLRWM Conference. There are 29 papers on the list.

Discussions were held with Dean Brogan, a consultant to SAIC regarding electronic transfers. The transfers centered on PACs and our records system.

Discussions are underway with YMPO on the status of LLNL-YMP backlogged documents from the 1983-87 period. About 31 file drawers of documents are stored by nine staff members. YMPO staff members visited LLNL to review the situation.

1.2.9.2 Project Control

A draft of the Short Range Plan for ITR was completed.

Completed three additional PACS P&S accounts for:

1. Chemical and Mineralogical Properties of the Waste Package Environment,
2. Mechanical Attributes of the Waste Package Environment, and
3. Engineered Barrier System Field Test.

Staff provided presentations on the LLNL PACS system to DOE and SAIC officials at YMPO on July 24.

Provided Estimate of Costs at Completion for FY90 to YMPO.

An estimate of taxes to the State of Nevada by LLNL-YMP activities for FY86 through FY90 - Year to Date was provided to YMPO.

1.2.9.3 Quality Assurance

The difficulty in calibrating balances has been resolved by writing new procedures in which users calibrate balances in place using standard weights which are in-turn calibrated by a qualified organization.

Distributed draft revision of QP 3.4 "Scientific Notebooks" internally for comments.

Conducted LLNL-YMP Audit 90-16 of Subcontractor Tektronix in Livermore.

Conducted LLNL-YMP Audit 90-18 of Subcontractor Tektronix in Beaverton, Oregon.

Transmitted to YMPO the responses to the Observations resulting from YMPO Audit 90-02.

Transmitted to YMPO the amended responses to SDRs 539 and 541.

Transmitted to YMPO Nonconformance Report LLNL-053 initiated by LLNL-YMP which identifies a Heise Pressure Gauge as being out-of-tolerance when received for calibration.

Transmitted to YMPO the Audit Report 90-04 resulting from the LLNL-YMP internal audit of "Indoctrination, Training and Qualification of Personnel," and "Review of Technical Publications."

Transmitted to YMPO copy of Surveillance Report S90-05 resulting from the recent internal surveillance of activity J-20-8.9 "Database Verification".

Transmitted to YMPO a list of Subcontractors having Quality Assurance Plans for LLNL-YMP as requested during the Project Manager-Technical Project Officer Meeting.

Transmitted to YMPO the LLNL-YMP FY90 Quality Assurance Surveillance Schedule, Rev. 4.

Transmitted to YMPO the LLNL-YMP FY90 Quality Assurance Audit Schedule, Rev. 6.

LLNL PROJECT STATUS REPORT DISTRIBUTION

EXTERNAL

M. Blanchard
Yucca Mountain Project Office
U.S. Department of Energy
Pox 98518
Las Vegas, Nevada 89193-8518

Paul Cloke
Science Applications Int'l Corp
101 Convention Center Drive # 407
Las Vegas, Nevada 89109-2005

M. Cloninger
Yucca Mountain Project Office
U.S. Department of Energy
P.O. Box 98518
Las Vegas, Nevada 89193-8518

W. Dixon
Yucca Mountain Project Office
U.S. Department of Energy
P.O. Box 98518
Las Vegas, Nevada 89193-8518

J. R. Dyer
Yucca Mountain Project Office
U.S. Department of Energy
P.O. Box 98518
Las Vegas, Nevada 89193-8518

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

J. Gilray
Nuclear Regulatory Comission
1050 East Flamigo
Room 319
Las Vegas, NV 89119

Jack Hale (RW-222)
DOE-HQ/Office of Civilian
Radioactive Waste Management
Forrestal Building
Washington, DC 20585

D. Hodges
Science Applications Int'l Corp
101 Convention Center Dr. # 407
Las Vegas, NV 89109-2005

V. Iorri
Yucca Mountain Project Office
U.S. Department of Energy
P.O. Box 98518
Las Vegas, Nevada 89193-8518

B. McKinnon
Science Applications Int'l Corp
101 Convention Center Drive # 407
Las Vegas, Nevada 89109-2005

D. Morissette
Science Applications Int'l Corp
101 Convention Center Drive # 407
Las Vegas, Nevada 89109-2005

E. H. Petrie
Yucca Mountain Project Office
U.S. Department of Energy
P.O. Box 98518
Las Vegas, Nevada 89193-8518

E. Wilmot
Yucca Mountain Project Office
U.S. Department of Energy
P.O. Box 98518
Las Vegas, Nevada 89193-8518

LLNL PROJECT STATUS REPORT DISTRIBUTION

LLNL - INTERNAL

R. AINES, L-219

L. BALLOU, L-206

J. BLINK, L-204

B. BRYAN, L-206

A. CAVAZOS, L-279

D. CHESNUT, L-202

W. CLARKE, L-202

D. EMERSON, L-204

L. JARDINE, L-204

W. JOHNSON, L-201

W. O'CONNELL, L-195

J. PODOBNIK, L-204

L. RAMSPOTT, L-209

M REVELLI, L-206

S. ROOT, L-144

D. RUFFNER, L-437

D. SHORT, L-204

R. STOUT, L-201

D. WILDER, L-204