

January 12, 2004

MEMORANDUM TO: Janet R. Schlueter, Chief  
High-Level Waste Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

FROM: Robert M. Latta, Sr. On-Site Licensing Representative */RA/*  
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SUBJECT U.S. NUCLEAR REGULATORY COMMISSION ON-SITE  
LICENSING REPRESENTATIVES' REPORT ON THE YUCCA  
MOUNTAIN PROJECT FOR SEPTEMBER 1, 2003, THROUGH  
OCTOBER 31, 2003

The purpose of this memorandum is to transmit the U.S. Nuclear Regulatory Commission (NRC) On-Site Representatives' (ORs) report for the period of September 1, 2003, through October 31, 2003.

This report highlights a number of Yucca Mountain Project activities of potential interest to NRC staff. The ORs continue to respond to requests from NRC Headquarters staff to provide various documentation and feedback related to Key Technical Issues (KTIs) and their resolution. During this reporting period, the ORs continued to observe activities associated with Yucca Mountain site activities, KTIs, and audits. The ORs also attended various meetings and accompanied NRC staff on visits to Yucca Mountain.

If you have any questions on this report or its attachments, please call Robert Latta on (702) 794-5048, or Jack Parrott on (702) 794-5047.

Attachments:

1. U.S. Nuclear Regulatory Commission On-Site Licensing Representatives' Report, Number OR-03-05 for the Reporting Period of September 1, 2003, Through October 31, 2003
2. Fig. 1: ESF/ECRB Plan View Alcove, Niche and Borehole Testing Locations
3. Table 1: Current Test Activities by Scientific Investigation Test Plan
4. Table 2: U.S. NRC On-Site Licensing Representatives' Tracking Report for Open Items

cc: See attached list

Memorandum to Janet R. Schlueter from R. Latta and J. Parrott, dated: January 12, 2004  
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cc: See attached list

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U.S. NUCLEAR REGULATORY COMMISSION  
ON-SITE LICENSING REPRESENTATIVES' REPORT

NUMBER OR-03-05

FOR THE REPORTING PERIOD OF SEPTEMBER 1, 2003, THROUGH OCTOBER 31, 2003

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Larry Campbell, Chief  
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Enclosure

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ON-SITE LICENSING REPRESENTATIVE REPORT  
NUMBER OR-03-05

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## ACRONYMS AND ABBREVIATIONS

<b>ACRO</b>	<b>TITLE</b>
AECL	Atomic Energy of Canada, Limited
AMR	Analysis Modeling Report
AOI	Audit Observation Inquiry
AP	Administrative Procedure
AUCH	Autonomous University of Chihuahua
BLM	Bureau of Land Management
BSC	Bechtel SAIC Company, LLC
CAP	Corrective Action Program
CAQ	Condition Adverse to Quality
CAR	Corrective Action Report
CIRS	Conditions Issues Identification
CR	Condition Report
DOE	U.S. Department Of Energy
DR	Deficiency Report
ECRB	Enhanced Characterization of the Repository Block
EM	Office of Environmental Management
ESF	Exploratory Studies Facility
EWDP	Early Warning Drilling Program
KTI	Key Technical Issue
LA	License Application
LP	Line Procedure
MII	Management Improvement Initiative
MOR	Monthly Operating Review
OQA	Office of Quality Assurance

## ACRONYMS AND ABBREVIATIONS - continued -

<b>ACRO</b>	<b>TITLE</b>
NRC	U.S. Nuclear Regulatory Commission
OCRWM	Office of Civilian Radioactive Waste Management
OR	On-Site Representative
QA	Quality Assurance
QARD	Quality Assurance Requirements Description
RCD	Root Cause Determinations
SCWE	Safety Conscious Work Environment
TSPA-LA	Total System Performance Assessment - License Application
UCCSN	University and Community College System of Nevada
USGS	U. S. Geological Survey
YMP	Yucca Mountain Project



## EXECUTIVE SUMMARY

### GENERAL SITE ISSUES

The site recorded a power outage on September 9, 2003. The power outage was due to power distribution problems offsite. Backup systems and tunnel evacuation functioned normally. During this reporting period, site operations continued a program to reduce the foot print of the facilities supporting Yucca Mountain.

### EXPLORATORY STUDIES FACILITY TESTING

The drift-scale thermal test in the exploratory studies facility continued its cool-down phase. Monitoring of the thermal test alcove and boreholes in the access observation drift continues.

### ENHANCED CHARACTERIZATION OF REPOSITORY BLOCK TESTING

During this reporting period, the project performed a ventilated entry beyond the sealed Enhanced Characterization of Repository Block Testing (ECRB) bulkheads at Stations 17+63, 22+01, 25+03, and 25+99 to remove old equipment and provide battery power to the remaining equipment. Preparations were made to begin tracer studies in the large-plot test in Alcove 8.

### SURFACE-BASED FIELD TESTING

Sampling of the Nye County Early Warning Drilling Program (EWDP) wells continued during this reporting period. Drilling of the remaining Phase IV wells will commence in November 2003. Continued water well drilling in Inyo County, California, has been put on hold until next fiscal year. Cuttings/core from the Peña Blanca, Mexico, site (natural analog program) were selected by the national labs for analysis.

### LABORATORY STUDIES

During this reporting period, post-migration radiometric analysis on the tuff blocks concluded. The transport behavior observed was consistent with that predicted on the basis of static sorption coefficients measured on unconsolidated samples of tuff.

### UPCOMING NEW TESTS AND STUDIES

The thermal management dispersion test at the Atlas facility is being fabricated and all required instruments are being calibrated. Test installation is scheduled to begin in early November 2003.

### MANAGEMENT IMPROVEMENT INITIATIVE COMPLETION STATUS

As of October 31, 2003, the project reported that 30 of the Management Improvement Initiative (MII) action statements (approximately 86 percent) had been confirmed completed. The remaining scheduled actions are currently with the responsible managers and include four actions that are related to procedures and one involving Safety Conscious Work Environment (SCWE). Although a draft set of effectiveness indicators associated with the MII have been developed, the project's final set of performance indicators is still under development.

Also, the On-Site Representatives (ORs) noted that the effective self-identification of deficiencies is an anticipated outcome of the MII. However, current indications are that line identified items for Bechtel SAIC Company, LLC (BSC) have remained at approximately 50 percent, which is below the project goal of 80 percent.

At the end of this reporting period, 11 actions related to Corrective Action Report (CAR) BSC-01-C-001, (open for 910 days) have been completed and verified by the U.S. Department of Energy's (DOE's) Office of Quality Assurance (OQA). The remaining action item is currently with the responsible manager.

Corrective actions related to CAR BSC-01-C-002, (open for 870 days) remain behind schedule. As of the end of October 2003, 23 of the 28 actions have been completed and verified as satisfactory. Five actions are in progress with the responsible manager, and one is currently with the confirmation team for completion. The ORs will continue to monitor the implementation of the MII corrective actions and the development of effective performance indicators.

### REVIEW OF QUALITY ASSURANCE REQUIREMENTS AND DESCRIPTION IMPLEMENTATION

During this reporting period, the ORs identified several issues which indicated an adverse trend involving the incorporation of the Quality Assurance Requirements and Description (QARD) program requirements into implementing documents. Specific areas of concern include: 1) the failure to adequately maintain Line Procedure (LP)-1.1Q, "Organization," which describes the organizational structures, functional responsibilities, levels of authority, interfaces, and lines of communication of the Office of Civilian Radioactive Waste Management (OCRWM); 2) discrepancies documented in CAR-BSC (O)-03-C-248, concerning inadequate implementation of QARD requirements related to the control of occupational radiological exposure in implementing procedures; and 3) failure to perform scheduled audits of various Office of Environmental Management (EM) sites at a frequency commensurate with the importance of high-level waste.

Based on the above noted examples of failure to follow QARD requirements, the ORs identified an item of concern (OR Open Item 03-06) related to ineffective implementation of QARD requirements.

### CORRECTIVE ACTION PROGRAM EFFECTIVENESS

The U.S. Nuclear Regulatory Commission's (NRC) Observation Audit Report No. OAR-03-03, dated July 23, 2003, documented the results of the staff's evaluation of recent software activities related to DOE's OQA Audit OQAP-BSC-3-07. Specifically, OQA's audit team determined that the actions to preclude recurrence were ineffective for Deficiency Reports (DRs) BSC (B)-03-D-98 (software use outside of the qualification parameters), BSC (O)-02-099 (technical reviews not performed), and BSC (B)-03-D-114 (incomplete software configuration control request), in that, repetitive conditions were identified during the audit. Subsequent to the identification of these conditions, OQA issued the following DRs BSC (O)-03-D-179, BSC (O)-D-176 documenting the respective conditions.

As a result of this audit, the ORs identified a concern related to the repetitive nature of some of the deficiencies associated with this oversight activity. Although OQA is currently reviewing recent Condition Reports (CRs) and software deficiency notices to determine if remedial corrective actions related to software are defensible, these actions are not directed at establishing if there is an adverse trend related to ineffective corrective actions. It was also noted, that there is no indication that these repetitive conditions will be evaluated for their

overall significance and impact related to program implementation. Additionally, the ORs identified repetitive deficiencies related to scientific notebook controls. However, at the conclusion of this reporting period, no escalation of this adverse condition had been initiated.

#### CONDITION REPORTING AND RESOLUTION

Administrative procedure (AP)-16.1Q, Revision 7, "Condition Reporting and Resolution," was issued on September 29, 2003, in accordance with a MII commitment to initiate a single corrective action program. The revised Corrective Action Program (CAP) provides for consolidating the previous corrective action, deficiency, and nonconformance reports into a unified CRs process with four significance levels.

Based on the ORs review of the revised CAP, several issues and areas for improvement were identified. These issues included the identification of discrepancies in the review and approval process related to draft versions of AP-16.1Q, limitations in access and CR approval processes, lack of procedural controls for the quality affecting activities performed by the Screening Committee, and difficulties encountered in the retrieval of trending and status information from the CAP system. The ORs will continue to monitor the implementation of the CAP and the results will be documented in a future report.

#### CORRECTIVE ACTION REPORT BSC (B) -03-C-107 (DATA MANAGEMENT AND UTILIZATION) - CLOSURE OF NRC OPEN ITEM 03-04

On March 14, 2003, BSC issued CAR BSC(B)-03-(C)-107 (CAR-107). This CAR, which was self-identified, documented numerous examples of Deficiency Reports (DRs) and CARs related to data used in technical products, that cumulatively represented inadequate implementation of QARD requirements and ineffective corrective actions to prevent recurrence.

During this reporting period, the ORs reviewed the Root Cause Determination (RCD) which was released the week of September 8, 2003 (over five months after the identification of CAR-107.) The ORs also reviewed the RCD team charter and BSC's lessons learned associated with the RCD for CAR 107. Based on the review of the completed RCD for CAR-107 and the related lessons learned, the ORs determined that appropriate actions had been initiated to address the extent of condition and that the established corrective actions appeared adequate to resolve the concerns identified in OR Open Item 03-04. Therefore, OR Open Item 03-04 is closed. However, it was noted that the corrective action plan for CAR-107 had not been completed at the end of this reporting period. Accordingly, the delayed development of this corrective action plan may warrant additional management attention.

#### MONTHLY OPERATING REVIEW

During this reporting period, the ORs attended the DOE Monthly Operating Review (MOR). These meetings include discussions concerning Project activities, management initiatives, quality assurance (QA) program issues, licensing, environmental safety and health, site operations, public affairs, and business administration issues for DOE and BSC managers. Additional topics discussed in the MOR meetings for this reporting period involve a summary of major issues, major accomplishments, performance indicators for work execution, project support, and project management. The increased focus and attention on improving performance, and enhanced management processes, represents an overall improvement in Project controls. However, the performance indicators for the project, as given in the MOR, are still not yet mature, and their effectiveness for indicating the performance is not known at this time. Many areas of performance have not yet developed sufficient metrics or data, to indicate

performance.

## **REPORT DETAILS**

### **INTRODUCTION**

The principal purpose of the OR report is to inform NRC managers, staff, and contractors of information on DOE programs in repository design, performance assessment, performance confirmation, and environmental studies that may be useful in fulfilling NRC's role during prelicensing consultation. The primary focus of this and future OR reports will be on DOE's programs for subsurface- and surface-based testing, performance assessment, data management systems, and environmental studies. Relevant information includes new technical data, DOE's plans and schedules, and the status of activities to pursue the License Application (LA). The ORs also take part in activities associated with resolving NRC Key Technical Issues (KTIs). This report covers the period of September 1, 2003, through October 31, 2003.

### **OBJECTIVES**

The ORs mission is to serve principally as a point of prompt information exchange and to identify preliminary concerns with site investigations and potential licensing issues. The ORs carry out this role by gathering and evaluating information, identifying concerns, and raising more significant issues to NRC management's attention. Communication with DOE is accomplished by exchanging information on data, plans, schedules, documents, activities and pending actions, and resolution of issues. The ORs interact with DOE scientists, engineers, and managers, with input from NRC Headquarters management, regarding the implementation of NRC policy, programs, and regulations. The ORs also focus on such issues as QA, design controls, data management systems, performance assessment, and KTI resolution. A primary OR role is to identify areas in site studies, activities, or procedures that may be of interest or concern to the NRC staff.

## **1 FIELD AND LABORATORY TESTING**

### **1.1 General Issues**

#### **Power Outages**

The site recorded a power outage on September 9, 2003. The power outage was site wide and due to power distribution problems from the Nevada Test Site. The Exploratory Studies Facility (ESF) tunnel was immediately evacuated by all personnel. The onsite backup generators automatically started and supplied power until offsite power was restored about an hour and a half later. There was no loss of scientific data from the outage but the tunnel ventilation fans had to be manually restarted the next day.

#### **Site Foot Print Reduction**

During this reporting period, site operations continued a program to reduce the foot print of the facilities supporting Yucca Mountain. As part of this program, more than 500 truck loads of surplus equipment, scrap, and waste are to be transported offsite.

## 1.2 Scientific Investigations

The DOE continues to conduct scientific and engineering investigations, or tests, to understand Yucca Mountain's geology, chemistry, hydrology, and other physical aspects and processes that could affect a potential repository's safety, and to provide input to a potential repository's design. DOE uses the results of this work to help form a safety and licensing basis for a potential repository.

Most of DOE's active scientific and engineering investigations are being done through their contracts with the national laboratories and the U.S. Geological Survey (USGS). Table 1 provides a list of the currently active or recently completed tests. Included in the list is the reference number of the plan for, and status of, each test at the end of the reporting period.

Also, DOE supports some scientific investigations through funding of Yucca Mountain Project (YMP) oversight to Nye County, Nevada and Inyo County, California. Under this program, these counties conduct independent scientific investigation programs. These are described under Section 1.5, "Surface Based Field Testing".

In addition, the University and Community College System of Nevada (UCCSN) has a cooperative agreement with the DOE's Office of Repository Development to participate in scientific and engineering studies of the Yucca Mountain repository site. A listing of all current and closed UCCSN scientific investigations can be found at: <http://hrcweb.nevada.edu/qa/sip.htm>.

DOE contracts with Atomic Energy of Canada, Limited (AECL) for scientific investigation of potential repository issues. AECL is currently working on three studies under the DOE QA program. They are: 1) radionuclide transport through tuff samples from Busted Butte; 2) crevice corrosion in titanium, Alloy 22, and stainless steel; and 3) neutron diffraction based measurements of strain in Alloy 22 test specimens.

The status of selected YMP tests are described below.

## 1.3 Exploratory Studies Facility Testing

The excavation of the ESF main drift, completed in 1997, allows the collection of scientific and engineering data at Yucca Mountain. DOE continues testing in the ESF main drift to supply data to support DOE's ongoing scientific studies. Figure 1 shows the ESF test locations. Ongoing ESF testing activities are summarized below.

### Alcove 5 (Drift-Scale Test)

Power to the heated drift was turned off in mid-January 2002, and the 4-year cool-down of the facility is being monitored in accordance with the established DOE test plan. At turn off, the surface temperature of Canister 1 was 201.1°C (394°F), the temperature of the rock was 201.1°C (394°F), and the temperature of the air was 204.4°C (400°F). As of the end of this reporting period, the surface temperature of Canister 1 was 77.2°C (171°F), the temperature of rock was 77.8°C (172°F), and the temperature of the air was 80.6°C (177°F). During this test, DOE is performed periodic visual and video inspection, water sampling, gas sampling, neutron logging, and electrical-resistance tomography. The data from this test have primarily been used as input to the Thermal Measurements Analysis Model Report (AMR).

#### 1.4 Enhanced Characterization of the Repository Block Testing

The excavation of the Enhanced Characterization of the Repository Block (ECRB) cross drift, completed in October 1998, allows the collection of scientific and engineering data in stratigraphic units that constitute the bulk of the potential repository horizon. DOE continues ECRB testing to supply data to support DOE's ongoing scientific studies. Figure 1 describes the ECRB test locations. ECRB testing activities are summarized below.

##### Sealed Portion of the ECRB Cross-drift

In an ongoing effort to monitor moisture conditions in the sealed portions of the ECRB, the bulkheads from Station 22+01 and beyond were closed on November 14, 2001. The bulkhead at Station 17+63 was closed on December 20, 2001. Before the closure of those bulkheads, Project personnel installed enhanced monitoring and collection equipment, including remote cameras and moisture-collection devices, in accordance with the revised test plan. Plastic sheets and drip cloths infused with a pH-sensitive chemical were installed near the crown of the tunnel, and numerous sample bottles were placed to collect possible drips from rock bolts.

DOE reopened the bulkhead at Station 17+63, on June 24, 2002. The main purpose for this entry was to take geotechnical rock property samples and to do a slot test in the lower lithophysal zone between Stations 17+63 and 22+01. The bulkhead at Station 17+63 will be resealed after completion of the sampling and other activities in the ECRB.

An unscheduled temporary entry past the bulkhead at 22+01 was made in January 2003 in response to smoke detected behind the bulkhead (see OR report OR-03-01). Related to the smoke event, and in an effort to remove all heat sources behind the bulkhead, external power to the instrumentation located behind the bulkhead was turned off in February 2003.

DOE (with NRC participation) conducted an unventilated entry past the sealed bulkheads at 22+01, 25+03, and 25+99, the week of July 7, 2003. The purpose of this entry is to make observations and begin planning to replace the external power sources for the instrumentation with batteries.

A ventilated entry into the ECRB began on September 8, 2003, to install batteries for the remaining instruments (no cameras) and to remove unused equipment. This activity continued throughout this reporting period. At the end of this activity all bulkheads, up to the bulkhead at 17+63, will be resealed for an indefinite period of time. The batteries installed should last in excess of one year.

##### Alcove 8 (Large Plot Test)

The Large-Plot Test is an infiltration test that uses a metal box, sectioned into twelve compartments, that is placed on the floor of Alcove 8, behind a bulkhead. Water is placed into the compartments to introduce water to the rock formation. This water seeps through approximately 20 m of the upper lithophysal zone and the middle nonlithophysal zone, of the Topopah Spring Tuff, and is collected in Niche 3 of the ESF. The large plot test started on August 20, 2002, with two of the compartments. On August 28, 2003, testing was expanded from two to twelve compartments by filling all twelve compartments with water to re-establish flow in each of the twelve infiltration zones. During this reporting period, monitoring of Niche 3 for observed seepage continued and preparations were made for tracer application.

## 1.5 Surface-Based Field Testing

### Nye County Early Warning Drilling Program

The EWDP was initiated as part of the Nye County Nuclear Waste Repository Project Office Yucca Mountain Oversight program. The purpose of the EWDP is to establish a groundwater monitoring system to protect the residents of Nye County, in Amargosa and Pahrump Valleys, against potential radionuclide contamination.

The program is also intended to provide geologic and hydrologic information to DOE's Yucca Mountain program. The targeted area is located in the hydrogeologic system south of Yucca Mountain. The questions planned to be investigated are: 1) the origin of spring deposits; 2) the geology and hydraulic properties of valley-floor sediments; 3) the recharge; and 4) groundwater-flow patterns.

### EWDP Phase IV Status

EWDP Phase IV began the week of October 20, 2002, with the abandonment of wells EWDP-5S and -2D. New wells EWDP-16P, EWDP-27P, EWDP-28P, EWDP-24P, and EWDP-29P have been drilled and completed in Phase IV. Drilling on the remaining Phase IV well locations is scheduled to begin in November 2003. Various EWDP wells were sampled during this reporting period. Detailed information on these wells (when available) and updates to the status of the Phase IV drilling Project can be found at: <http://www.nyecounty.com/ewdpmain.htm>.

### Inyo County Well Drilling

In early April 2003, Inyo County, California, began drilling the first of five deep monitoring wells in the county, as part of its Yucca Mountain oversight program. This undertaking is entitled the "Inyo County Death Valley Lower Carbonate Aquifer Monitoring Program." The county's rationale for drilling these new wells is to: 1) evaluate regional groundwater flow through the southern Funeral Mountains; 2) establish structural controls on flow paths and discharge areas; and 3) evaluate potential zones of mixing between the deep regional groundwater systems and the local shallow groundwater systems to the northeast. The first of these new wells (Travertine #2) was drilled to a depth of 409 meters (1341 feet). The well has been completed and pump tested, and the USGS collected water samples. This well is located south of Yucca Mountain, in Death Valley National Park. Drilling of the next well in Inyo County is expected to begin in November 2003 at a site near Furnace Creek also in Death Valley National Park.

### Peña Blanca (Natural Analog Program)

Drilling commenced in mid-March 2003. All four of the planned exploratory boreholes were drilled and cored. The four boreholes were completed to just below the water table as test wells for water sampling. During this reporting period, specimens of the core/cuttings, stored at the Autonomous University of Chihuahua (AUCH) campus, were selected by the national laboratories' principal investigators for analysis. The samples will be shipped by AUCH directly to the laboratories. No samples will be shipped to the YMP's sample management facility.

### Disruptive Events Field Investigation

During the last reporting period, the locations for igneous anomalies, to be drilled on Bureau of Land Management (BLM) land in the Crater Flat/Amargosa Valley area, were being evaluated in an environmental assessment of the proposed work being prepared



for BLM. No field activity occurred during this reporting period.

#### 1.6 Laboratory Studies

##### Laboratory Study of Radionuclide Transport in Non-Welded Tuff

During this reporting period, the post-migration radiometric analysis on the unsaturated tuff block being conducted at AECL Laboratories was concluded. The transport behavior observed was consistent with that predicted on the basis of static sorption coefficients measured on unconsolidated samples of tuff.

#### 1.7 Upcoming New Tests and Studies

During this reporting period the components for the Bench Scale Vapor Dispersion Test (test plan SITP-03-EBS-001) were being fabricated and all required instruments (i.e., temperature sensors, humidity sensors, gas detection system, and pressure, are being calibrated. Test installation is scheduled to begin in early November 2003 at the DOE Atlas facility in North Las Vegas.

### **2. OUTREACH ACTIVITIES**

#### 2.1 ORs Presentation at Sun City, Las Vegas

On October 23, 2003, the ORs participated in a presentation at a neighborhood meeting on the Yucca Mountain program. This meeting was held for residents of the Sun City community in Las Vegas, Nevada. The ORs presentation covered the NRC's role in pre-license application oversight, license application review, and license application adjudication for a proposed Yucca Mountain repository. Staff members from DOE, BSC, and a nuclear utility also made presentations. They discussed site characterization, repository design, license application, transportation, and the importance of a repository to the commercial nuclear utility industry. In addition, the former governor of Nevada, Robert List, spoke on the potential benefits of a Yucca Mountain repository to the State of Nevada. The meeting was attended by approximately 55 residents of Sun City. It was well received and the interaction provided an effective outreach opportunity.

#### 2.2 Native American Workshop

On October 28 & 29, 2003, staff from the Office of Nuclear Material Safety and Safeguards (NMSS) [Spent Fuel Project Office, Division of Waste Management (DWM) including staff from the ORs Office], Office of the General Counsel, and Office of State and Tribal Programs (OSTP) conducted a workshop for Native American Tribes on regulatory and technical subjects associated with the storage and transportation of spent fuel to the proposed Yucca Mountain repository. The staff discussed information on topics that included the licensing and hearing process, the design and engineering requirements for the proposed repository and transportation and emergency preparedness. This workshop was held in Las Vegas, attended by approximately 16 Native Americans representing 7 Tribes, and was held in response to a request from those Tribal Representatives who attended a previous NRC sponsored workshop held in 2002, in Las Vegas, Nevada.

### **3 QUALITY ASSURANCE AND ENGINEERING**

### 3.1 Management Improvement Initiative Completion Status

There are 29 discrete action statements associated with the 5 MII Action Plans (6 Action Statements have dual responsibility for a total of 35 discretely monitored activities). Additionally, there are 40 action statements (three additional items added to CAR-002 commitments through amended responses), related to CARs BSC-01-C-001 (Models) and BSC-01-C-002 (Software). As of October 31, 2003, the project reported that 30 of the MII action statements (approximately 86 percent) had been confirmed completed. The remaining scheduled actions are currently with the responsible managers, and include four actions related to procedures and one involving the SCWE program.

Although a draft set of effectiveness indicators associated with the MII have been developed, the project's final set of performance indicators was still under development at the end of October 2003. The ORs also noted that the effective self-identification of deficiencies is an anticipated outcome of the MII. However, current indications are that line identified items for BSC have remained at approximately 50 percent, which is below the project goal of 80 percent.

At the end of this reporting period, 11 of the 12 actions related to CAR BSC-01-C-001, (open for 910 days), have been completed and verified by OQA. The remaining action item is currently with the responsible manager.

Corrective actions related to CAR BSC-01-C-002 (open for 870 days), remain behind schedule. As of the close of this reporting period, 23 of the 28 actions have been completed and verified as satisfactory. Five actions are in progress with the responsible manager, and one is currently with the confirmation team for completion.

The ORs reviewed nine additional MII confirmation packages, during this reporting period. Based on the results of this review, the OR's continue to find the confirmation process to be an effective mechanism for ensuring completion of the MII commitments, and the associated documentation. Although progress has been made in addressing corrective actions in the MII, the ORs identified a concern regarding four of the remaining MII actions related to programs that are behind schedule. Specifically, the MII actions to perform a survey of the SCWE implementation by July 2003 is overdue, and the establishment of a set of new or revised DOE/BSC program procedures, targeted for completion by April of 2003, is behind schedule (estimated completion November 2003). Accordingly, the ORs will continue to monitor the implementation of the MII corrective actions, and the development of effective performance indicators. These issues will also be potential areas for discussion at the next NRC/DOE Quarterly QA Management meetings, scheduled for February 2004.

### 3.2 Review of Quality Assurance Requirements and Description Requirements Implementation

During this reporting period, the ORs identified several issues which indicated an adverse trend involving the incorporation of the QARD program requirements into implementing documents. The following are examples of inadequate implementation of QARD requirements.

Revision 13 of the QARD and Administrative Procedure (AP)-5.1Q, "Procedure Preparation, Review, and Approval," require, when project changes are made, that a review be conducted of applicable quality related procedures to assess impact and potential conflicts. If a change is necessary, the impacted document is to be revised and issued concurrently with the revision of the QARD. However, during this reporting period the ORs determined that Line Procedure (LP)-1.1Q, "Organization" has not been

appropriately maintained to reflect project changes. Specifically, this quality affecting document which describes the organizational structures, functional responsibilities, levels of authority, interfaces, and lines of communication of OCRWM has not been revised to reflect current organizational structures. Following the identification of this issue, a CR, OCRWM-(O)-03-D-075, was initiated on March 27, 2003, documenting that the organization structure listed in the procedure does not accurately reflect the changes instituted by DOE's reorganization, which was in October 2002.

Subsequent to the identification of this condition adverse to quality, OQA performed an impact review. This impact review established that although Revision 13 of the QARD had been evaluated and the need to revise the Project's organizational description was identified, the necessary changes to LP-1.1Q had not been completed. The impact review also determined that the Project's "Procedures and Responsibilities Index" indicates that LP-1.1Q has been "Canceled". However, based on discussions with OQA personnel, this status was determined to be in error. At the conclusion of this reporting period the status of the action being taken to bring the LP-1.1Q in line with the requirements of the QARD had not been defined.

The ORs also reviewed discrepancies documented in CAR-BSC (O)-03-C-248, dated August 28, 2003, concerning five implementing procedures associated with the Radiation Protection Program. As documented in this significant condition adverse to quality, five procedures related to the radiological effluents program were identified as being in noncompliance with QARD requirements. Specifically, the elements related to Subsection 2.2.2.A.6 of the QARD, concerning the control of occupational radiological exposure had not been appropriately addressed in the implementing (non-quality affecting) procedures. Based on the ORs initial review of this CAR, it appeared that the impact and requirement reviews related to the QARD flow-down requirements, were not adequate to determine the conflicting requirements. It was also determined that the root cause determination for CAR-BSC(O)-03-C-248, was incomplete. The recommended action was to change the requirements contained in the QARD rather than implementing the necessary changes to the procedures to align them with the specified requirements. At the conclusion of this reporting period, no definitive response had been provided with respect to the implementation of the requirements contained in Subsection 2.2.2.A.6 of the QARD.

Subsection 18.2.1 of the QARD requires that "audits shall be scheduled at a frequency commensurate with the status and importance of the work and be conducted annually, or once during the life of the work, whichever is shorter." However, based on the OR's review of CR-OQA(O)-03-D-202, dated July 22, 2003, it was determined that scheduled audits of various Office of Environmental Management (EM) sites have not been performed at a frequency commensurate with the importance of the high-level waste work. Additionally, the ORs determined that a related discrepancy had previously been documented on DR-EM-01-089, dated June 21, 2001. This DR documented that no oversight audits of EM programs had been performed and that no central QA organization existed. These nonconforming conditions both involved organizational changes that resulted in inadequately defined interface controls. Discussions with QA personnel indicated the cancellation of the audits was made by OQA management. However, it could not be determined if other forms of evaluation would be performed of these sites or products, to assure compliance with the QARD requirements.

The ORs also reviewed CR-756, dated October 7, 2003, concerning the incorporation of QARD requirements into procedures during the preparation and QA review process. Specifically, based on OQA's evaluation of recent CRs, it was determined that during

the last two years approximately 12 quality affecting procedures had been approved without meeting the applicable QARD requirements. As described in CR-756, the affected procedures did not adequately address the QARD or upper-tier procedural requirements. Furthermore, the CR stated that procedure AP5.1Q, "Procedure Preparation, Review, and Approval" requires, in part, that the preparer (1) identify the scope of the change considering requirements and commitment changes to the QARD or other requirements documents; (2) ensure that the content of the procedure complies with established requirements; and (3) confirm that the review was conducted by an individual knowledgeable of the requirements and organizational interfaces.

Based on the above noted examples of inadequate incorporation of QARD requirements into quality affecting documents, and the failure to perform required oversight activities, the ORs identified an item of concern related to the implementation of QARD requirements. Therefore, pending the resolution of these issues and the projects development of a plan to address the appropriate flow-down of requirements, this item is identified as **OR Open Item 03-06**.

### 3.3 Corrective Action Program Effectiveness

#### 3.3.1 Software Controls

The NRC's Observation Audit Report No. OAR-03-03, dated July 23, 2003, documented the results of the staff's evaluation of recent software activities related to DOE's OQA audit OQAP-BSC-3-07. As stated in the NRC's report, the staff concluded that the overall effectiveness of the software implementation process was "Indeterminate." This characterization was based, in part, on the results of DOE's audit team which found the critical elements related to Design, Implementation, and Testing of the software life cycle were "Not Effective." As a result of this audit, the ORs also identified a concern related to the repetitive nature of some of the deficiencies associated with this oversight activity. Specifically, OQA's audit team determined that the actions to preclude recurrence were ineffective for DRs BSC (B)-03-D-98 (software use outside of the qualification parameters), BSC (O)-02-099 (technical reviews not performed), and BSC (B)-03-D-114 (incomplete software configuration control request), in that, repetitive conditions were identified during the audit. Subsequent to the identification of these conditions, OQA issued the following DRs BSC (O)-03-D-179, BSC (O)-D-174, and BSC (O)-D-176 documenting the respective conditions. Additionally, OQA's audit team identified repetitive conditions related to the following DRs: (1) BSC (B)-03-O-067 (software used outside its operating environment), (2) BSC (B)-03-D-083 (software used outside its operating environment), (3) BSC (O)-02-D-099 (review of technical and quality requirements), (4) LANL (B)-02-D-062 (submission of incorrect validation test code), and (5) BSC-02-D-070 (software control).

Based on discussions with cognizant OQA personnel, it was determined that three technical specialists involved with the audit are currently reviewing approximately 90 CRs and 300 software deficiency notice and problem reports, to determine if remedial actions taken on the software and the supporting documentation are defensible. The report associated with this activity is scheduled for completion by the end of October. However, these reviews are not directed at determining if there is an adverse trend related to ineffective corrective actions and there is no indication that repetitive conditions will be evaluated for their overall significance and impact with respect to program implementation.

### 3.3.2 Scientific Notebook Controls

Previous deficiencies related to scientific notebook controls, were documented in 1999, and again in 2001. These deficiencies identified inadequate technical and compliance reviews, and the lack of timeliness in the completion of record packages. During this reporting period the ORs reviewed CR BSC-(B)-03-D-164, dated June 10, 2003, which identified similar problems at Laurence Livermore National Laboratory. Although this CR identified a repetitive condition, which is indicative of ineffective corrective action (i.e. action taken has not prevented reoccurrence), no escalation of the condition was initiated.

### 3.4 Condition Reporting and Resolution, Administration Procedure -16.1Q

AP-16.1Q, Revision 7, "Condition Reporting and Resolution", was issued on September 29, 2003, in accordance with a MII commitment to initiate a single corrective action program. The revised program provides for consolidating the previous corrective action, deficiency and nonconformance reports into unified CRs, a process with four levels of severity. Level "A" represents the most significant category of deficiencies, formerly classified as CARs; Level "B" replace the previous DRs; Level "C" supercedes nonconformance and technical evaluation reports; and Level "D", is used to document items formerly classified as corrected during the audit or opportunities for improvement. The CAP is accessed through an electronic data base system. The legacy information (open items) from the previous deficiency documentation systems were brought forward into the CAP. Screening and Management committees have also been established by charter for the review of CRs.

Based on the OR's review of the CAP and discussions with OQA personnel, the following issues were identified.

AP-16.1Q is one of the first project procedures to undergo the revised development and review process defined in AP-5.1Q, Revision 7. During the review of Revision "A" of this procedure, over 670 comments were provided against this document, of which 247 were identified as mandatory. All of these comments were resolved in a relatively short period of time. The ORs review of the records package associated with Revision A indicated instances of inadequate documentation of comment resolution, and numerous examples of responses that did not appropriately address the comment. Specifically, one ambiguous resolution statement that was used to address multiple comments that did not adequately resolve any of the stated comments.

The revised deficiency documentation process was developed to allow anyone on the project an opportunity to document a concern on a CR. However, several impediments to this process have been identified during the initial phase of implementation. These include the limitation that in order to initiate a CR, personnel must complete computer based training and be assigned an individual identifier. Because some of the personnel on the project, including workers at the site, do not have ready access to computer terminals, this issue is problematic. Although, provisions have been made for personnel without electronic access to initiate deficiencies on a hard copy CR, these documents must be processed through craft supervision and forwarded to the Screening Committee, which may become a hindrance to report initiation. The OR's also determined that unlike other project organizations, OQA personnel had been instructed to initiate a hard copy for supervisory review prior to the initiation of the electronic copy. This process is not described or required in the procedure. It was noted that following the identification of this issue, OCRWM management took prompt action to clarify that supervisory approval was not necessary prior to the submittal of a CR.

Also, AP-16.1Q provides for the escalation of repetitive conditions by the Screening committee, based on the lack of effective corrective actions. However, no controls have been provided in the procedure on how this action is to be performed. Based on the continued identification of repetitive conditions and the projects lack of effective corrective actions to prevent recurrence, the lack of adequate procedural controls in this area represents an inadequacy in this process.

Additionally, the ORs became aware of difficulties encountered in retrieving trend or status information from the CAP system. During the transition period, historical deficiency documentation information is being maintained in the old system, pending the resolution of these operational anomalies. Also, the ORs determined that, unlike the previous Conditions Issues Identification Reporting Resolution System (CIRS), the new CAP process has no provisions for the anonymous submittal of concerns.

The ORs will continue to monitor the implementation of the CAP and the results will be documented in a future report.

### 3.5 Corrective Action Report (BSC (B)-03-C-107 (Data Management and Utilization Closure of NRC Open Item 03-04

On March 14, 2003, BSC issued CAR BSC(B)-03-(C)-107 (CAR-107) (currently CR 16). This CAR, which was self-identified, documented numerous examples of DRs and CARs related to data used in technical products, which cumulatively represented inadequate implementation of QARD requirements and ineffective corrective actions to prevent recurrence. In response to the issues identified in CAR-107, the Manager of Projects initiated actions to confirm the qualification status and application of data within each AMR directly used as input for the Total System Performance Assessment (TSPA) LA. Additionally, a Data Confirmation Plan to define the acceptance process, implementation schedule, and resources was initiated.

As a result of the review of documentation associated with the initial response, the ORs generally determined that appropriate corrective actions had been initiated in response to CAR-107. However, as previously documented in OR Report 03-03, dated August 15, 2003, a concern was identified (OR Open Item 03-04) that related to the length of time to complete the RCD for CAR BSC(B)-03-(C)-107. During this reporting period, the ORs reviewed the RCD, which was released the week of September 8, 2003 (over five months after the identification of CAR-107). The ORs also reviewed the RCD team charter and BSC's lessons learned associated with the RCD for CAR's 097 and 107.

Based on the results of this review the ORs determined that the RCD identified the following primary causes: 1) data (and related terms), were not adequately defined and their associated licensing requirements were not formally documented and linked to the requirement documents to provide the basis for procedure development; 2) management had not provided sufficient leadership to the organization, so that data management and usage activities were performed in a consistent and compliant manner; 3) management had not provided the leadership necessary to establish a CAP that is timely and prevents non-compliance recurrences; and 4) accountability for following procedures was not adequately implemented.

The RCD for CAR-107 also identified the following contributing factors: 1) failure to recognize the importance of ensuring that key procedures are based, when appropriate, on the Company's formal interpretation of the requirements document; 2) escalation of important issues to management did not result in effective action being taken to resolve long term quality issues; and 3) management was not held accountable for assuring effectiveness of corrective actions.

Based on the review of the RCD for CAR-107, the ORs concluded that the findings adequately addressed the identified problem statements. It was also determined that the proposed remedial actions appropriately included provisions for: 1) confirmation of the qualification status and application of affected data, 2) preparation and implementation of a data confirmation plan, and 3) effectiveness evaluation of the data confirmation plan using the self-assessment process.

Also, the ORs evaluated the schedule delays related to the development of the RCD for CAR -107. As described in the lessons learned associated with CAR-107 (OCRWM-LL-2003-123) there were several reasons for the RCD taking longer than expected to complete. These include the number of organizations and personnel involved, team makeup and stability, unclear scope and definition, the lack of regular status meetings, fluctuations in team composition, inconsistent support, and the breadth of the issues covered. The lessons learned also identified that the charter for the evaluation of CAR-107 established an unrealistic completion date, that the Charter was changed after the root cause team commenced activities, and that the root cause methodology was changed. The lessons learned related to CAR-107 also identified recommended actions, which include early initiation of root cause planning, clear scope and charter identification, assignment of full time members with requisite qualifications, agreement on completion dates, and compulsory management updates.

Based on the review of the completed RCD for CAR-107 and the related lessons learned, the ORs determined that appropriate actions had been initiated to address the extent of condition; and that the established corrective actions appeared adequate to resolve the concerns identified in OR Open Item 03-04. Therefore, OR Open Item 03-04 is considered closed. However, it was noted that the corrective action plan for CAR-107 had not been completed at the end of this reporting period. Accordingly, the delayed development of this corrective action plan may warrant additional management attention.

### 3.6 Observation of Audit OQAC-BSC-03-13

During the week of September 22, 2003, the ORs observed selected aspects of the OCRWM compliance-based audit of BSC. The purpose of this audit was to confirm compliance with the procedures that implement the sections of DOE/RW-0333P, QARD that are applicable to the Las Vegas BSC facilities scope of work. Specifically, DOE's OQA evaluated procedural compliance with the QARD sections related to:

Organization, QA Program, Procurement Document Control, Implementing Documents and Document Control, Control of Purchased Items and Services, Nonconformances, Corrective Actions, QA Records, and External Audits. Additionally, the audit team evaluated the effectiveness of corrective actions from closed deficiency documents identified during the previous QA verification activities.

Observations performed during the audit confirmed that the joint audit team, which included representatives from BSC QA, was well prepared and that the team members effectively evaluated procedural implementation within their respective areas. Emergent issues were appropriately addressed by the team and objective evaluation criteria were used to examine implementation of the pertinent QARD requirements. The audit team performed a thorough review and the responsible BSC organizations were supportive of the teams efforts. However, direct BSC management involvement during the audit appeared to be limited.

As a result of the audit, 13 Conditions Adverse to Quality (CAQ) were identified. Although these CAQs did not appear to be directly linked to a specific programmatic inadequacy, it was noted that the cumulative impact of these issues indicates an apparent lack of management support. Additionally, it was noted that these CAQs demonstrated a pattern of inattention-to-detail during the development, review and approval process for quality affecting activities. This is indicative of a lack of accountability. These issues represent an area of concern that are scheduled for discussion during the November 12, 2003 Quarterly QA meeting with DOE.

### 3.7 Corrective Action Report -BSC-02-C-001 (CAR 02-01) - Closure of NRC Open Item 02-13

Corrective Action Report (CAR) BSC-02-C-001 (CAR-02-01) was issued on November 27, 2001, following the identification of multiple deficiencies involving the failure of Project Management to establish the necessary training requirements matrix and job functions for subcontractor personnel. The CAR identified numerous instances where individuals had been listed as "Unassigned," in the training department database, and that it was unknown if these individuals had performed quality affecting work. The CAR also indicated that it could not be determined if the requirements of AP-2.1Q, "Indoctrination and Training of Personnel," and AP-2.2Q, "Establishment of Required Education and Experience of Personnel," were being appropriately implemented.

As previously documented in OR Report 02-05, dated December 18, 2002, the ORs reviewed the status of corrective and preventive actions related to CAR-02-01, to assess the effectiveness of these initiatives. Based on the evaluation of BSC's follow-up surveillance, it was determined that an incomplete justification had been established for the closure of the CAR. Additional concerns related to the inadequate implementation of corrective actions were identified with respect to similar deficiencies, one of which documented a recurring condition indicative of an adverse quality trend. Pending the implementation of corrective actions to address the deficiencies identified in CAR-02-01, and the related DRs, this issue was identified as OR Open Item 02-13.

- DR BSC-01-D-129, Training to Required Procedures Not Performed Within Prescribed Time Frames;
- DR BSC (B)-01-D-159, Verification of Required Education and Experience (VoEE) of Personnel Not Located; and
- DR BSC (O)-02-D-176 (currently CR 78), VoEEs Do Not Meet Position



Descriptions, No Evidence of Position Descriptions for Employees, VoEEs Not Approved by Functional Manager, and Work performed Prior to VoEEs Approval.

The ORs reviewed the corrective actions related to CAR-02-01, which was closed on October 16, 2003, and the documentation associated with the associated DRs. Based on the results of these reviews, it was determined that a revised BSC Statement of Work (SOW) had been appended to all staff augmentation subcontracts. The revised SOW reenforced the requirement of contractors to comply with the provisions of procedures AP2.1Q and AP2.2Q. Additionally, the SOW required submission of documentation of personnel qualifications to the appropriate functional manager prior to the start of work. A requirement was also added to the Technical professional Services subcontract to ensure that affected personnel are properly trained in accordance with AP2.1Q. The actions-to-prevent-recurrence added similar requirements to procedures LP-4.3Q-BSC, "Subcontracts," and LP-4.4Q-BSC, "Technical Service Agreements." As a result of these reviews, it was determined that appropriate preventive and remedial actions had implemented to address the conditions identified in CAR-02-01, and that actions to preclude recurrence are adequate. Therefore, OR Open Item 02-13 is closed.

#### **4.0 GENERAL ACTIVITIES**

##### **4.1 Meetings**

On September 16-17, 2003, staff from DWM, including an OR, attended the Nuclear Waste Technical Review Board meeting in Amargosa Valley, Nevada. DOE gave updates regarding the development of technical basis documents, engineered barrier system performance, chlorine 36, flow and radionuclide transport in the unsaturated and saturated zones, performance confirmation, the igneous program, and transportation issues.

On September 30, 2003, DOE and NRC staff, including an OR, conducted a Technical Exchange in Las Vegas, Nevada, in which DOE presented its approach to addressing NRC staff information needs associated with Pre-closure (PRE) Agreement 3.01. The DOE presentations covered the following: (1) a summary of the status of PRE 3.01; (2) the identification of aircraft hazards in the vicinity of Yucca Mountain; and (3) the estimation of aircraft crash frequencies in the vicinity of Yucca Mountain. DOE agreed to continue to gather and analyze information regarding this agreement.

##### **Monthly Operating Review (MOR)**

The ORs attend the DOE Monthly Operating Report (MOR) meeting. These meetings include discussions concerning Project activities, management initiatives, QA program issues, licensing, environmental safety and health, site operations, public affairs, and business administration issues for DOE and BSC managers. Additional topics discussed in the MOR meetings for this reporting period involve a summary of major issues, major accomplishments, performance indicators for work execution, project support, and project management.

During these meetings the responsible DOE managers provided the overall status of their respective programs using the standard industry identifiers of red, yellow and green to characterize overall performance. Although the set of primary and secondary indicators related to Work Execution and Management are still under development, the color coding of the activities including trend information appear to be appropriate and

the management direction provided in these meetings is to maintain adverse indicators until sustained improvements have been achieved. These presentations typically involved candid evaluations of problem areas including critical path activities, and critiques of performance that focus on accountability and methods for improvement. This increased focus and attention on improving performance and enhanced management processes, represents an overall improvement in Project controls and continues to be identified as a management strength related to the Yucca Mountain Project.

However, it is the general impression of the ORs that the performance indicators for the project, as given in the MOR, are still not mature, and their effectiveness for indicating performance is not known at this time. Many areas of performance have not yet developed sufficient metrics or data to indicate performance. Areas with "Red" performance indicators at the end of this reporting period are Key Technical Issues, Surface Facilities, Pre-closure Safety Analysis, and Corrective Action Management System, including self reporting culture, causal analysis & CAP development, and timely and effective CAR.

A summary of work execution for the project, as of the end of this reporting period, indicates that overall progress towards LA is 46 percent complete, KTI agreement closure is 60 percent (out of 190) complete, the LA document is 7 percent complete, Pre-closure safety assessment is 51 percent complete, TSPA-LA is 71 percent complete, and design is 42 percent complete. The status of the data, codes, and models for LA is: 1) Data - out of an estimated 1376 data sets, 693 are qualified, 473 have been submitted for verification, and 210 are under development; 2) Codes - out of an estimated total of 423 codes to be used for LA, 65 have been qualified and completed IV&V, 344 are qualified but need retesting (legacy software), and 14 are under development; and 3) Model Reports - out of a total number of 65 model reports that directly support LA, 45 have been completed and 20 are incomplete.

#### 4.2 Site Visits

On September 18, 2003, an OR escorted a tour of Yucca Mountain for NRC headquarters and Center for Nuclear Waste Regulatory Analysis (CNWRA) staff to familiarize them with the Project. Also, on September 19, 2003, an OR escorted a tour, along with staff from the Nye County, Nevada, Department of Natural Resources and Federal Facilities, of Amargosa Valley, Nevada, for NRC headquarters and CNWRA staff. On the tour, the staff met with the owners and operators of three farms in the area to discuss their farming methods and their use of ground water for irrigation. The staff also visited the Ash Meadows National Wildlife Refuge to observe and discuss the springs in the area that support protected animal species.

On October 15, 2003, NRC's ORs for Yucca Mountain escorted a tour of Yucca Mountain, for Spanish Nuclear Safety Counsel Commissioner Julio Barceló, the Director of NRC's NMSS, the Regional Administrator of NRC Region IV, NRC's Chief Financial Officer, the Deputy Director of NRC's DWM, and a staff member from NRC's Office of International Programs. The tour included an entrance into the exploratory studies facility (main tunnel), with stops that included the drift-scale thermal test, and areas of fracture and fault studies. Also, DOE's Yucca Mountain Science Center in Las Vegas was visited.



**CURRENT TEST ACTIVITIES BY SCIENTIFIC INVESTIGATION TEST PLAN**

**Table 1**

<b>Test Plan Title</b>	<b>Test Plan Identifier</b>	<b>Test Plan Status</b>
Ash Redistribution Studies and Field Studies of Lava Morphology & Igneous Processes	SITP-02-DE-001	Test complete
Bench Scale Vapor Dispersion Test Plan	SITP-03-EBS-001	Test scheduled to start in early FY04
Construction Monitoring Equipment Installation and Data Collection	SITP-03-EBS-002	Test ongoing
Atlas Natural Convection Test	SITP-02-EBS-002	Test complete, report in process
Field Thermal Conductivity Testing	SITP-02-EBS-003	Test ongoing
Reactive Transport Column Experiments	SITP-02-EBS-004	Tests complete, report in process
Atlas Breached Waste Package and Drip Shield Experiments	SITP-02-EBS-005	Testing complete, report in process
Laboratory Thermal Conductivity Testing	SITP-02-EBS-006	Testing complete, report in process
TSW Fracture and Lithophysal Studies	SITP-02-ISM-001	Test complete
Geologic Mapping of Repository Footprint Southern Expansion and Jet Ridge	SITP-02-ISM-002	Test deferred to 2005
Peña Blanca and Drift Shadow Zone Natural Analog Studies	SITP-02-NA-001	Test ongoing
Rock Modules Testing	SITP-02-SSD-001	Test complete, report in process
Mechanical Properties Laboratory Investigations	SITP-02-SSD-002	Test ongoing
Ground Support Testing	SITP-02-SSD-003	Test complete
Nye County EWDP Borehole Lithostratigraphy	SITP-02-SZ-001	Test ongoing
Hydrologic/Hydrochemistry Studies in Cooperation with Nye County EWDP	SITP-02-SZ-002	Test ongoing
Alluvial Testing Complex- Single-well, Multi-well, and Laboratory Studies	SITP-02-SZ-003	Test deferred
[Studies in Cooperation with Inyo County Borehole Program]	New test plan will be developed	
Laboratory Sorption Measurements- SZ	SITP-02-SZ-004	Test complete, data submitted
Moisture Monitoring in the ECRB Bulkhead Cross Drift	SITP-02-UZ-001	Test ongoing
Niche 5 Seepage Testing	SITP-02-UZ-002	Testing complete, SITP to be decontrolled
Alcove 8 Flow & Seepage Testing	SITP-02-UZ-003	Test ongoing
Systematic Hydrologic Testing in	SITP-02-UZ-004	Test deferred to 2005

<b>Test Plan Title</b>	<b>Test Plan Identifier</b>	<b>Test Plan Status</b>
the ECRB Cross Drift		
Chlorine-36 Validation	SITP-02-UZ-005	Test complete, report in process
Unsaturated Zone Transport Test at Busted Butte, Nevada	SITP-02-UZ-006	Testing complete, SITP to be decontrolled
UZ Hydrochemistry Investigation	SITP-02-UZ-007	Test deferred to 2005
Fluid Inclusion and Thermal History of Yucca Mountain	SITP-02-UZ-009	Test deferred to 2005
Moisture Monitoring Investigations and Alcove 7 Studies	SITP-02-UZ-010	Test ongoing
Laboratory Sorption Measurements - UZ and SZ	SITP-02-UZ-011	Test deferred to 2005
D1rift Scale Test	SITP-02-UZ-012	Test ongoing
Laboratory Flow/Coupled Process Block Experiments	SITP-02-UZ-013	Test deferred to 2005
Niche 4 Seepage Testing	SITP-02-UZ-015	Test complete, SITP to be decontrolled
Long-Term Studies of the Degradation and Nuclide Release Commercial Spent Fuel and Fuel Rod Segments	SITP-02-WF-001	Test ongoing
Long-Term Studies of the Degradation and Radionuclide Release from Defense High-Level Waste (DHLW)	SITP-02-WF-002	Test ongoing
Waste Form Colloids Characterization and Concentration Studies	SITP-02-WF-003	Test ongoing
Validation of Dissolved Radionuclide Concentration Limits	SITP-02-WF-004	Test ongoing
Waste Form Dissolution Studies	SITP-02-WF-006	Test ongoing
Waste Form Oxidation Response Tests	SITP-02-WF-007	Test ongoing
CSNF Colloid Release Testing	SITP-02-WF-008	Test ongoing
PNNL Dissolved Concentration Validation Testing	SITP-02-WF-009	Test ongoing
Waste Package and Drip Shield Materials Testing	SITP-02-WP-001	Test ongoing
Waste Package Environment Investigations – Dust Geochemistry	SITP-02-WP-008	Test ongoing
Microclimate Records in Fracture Minerals	SITP-03-UZ-016	Test deferred

**U.S. NRC On-Site Licensing Representatives' Tracking Report for Open items Followed in Bi-Monthly OR Report**

**TABLE 2**

(For NRC tracking only) AOI-YMSCO-ARC-02-12-01	Identifies the need for DOE OQA to ensure that procedure development and review process includes a documented evaluation to verify compliance with the requirements of the Project's QARD.	OR Report No. OR-03-01	Date Item Closed: <b>OR Report No.: OR-03-03 August 15, 2003</b>
OR Open Item 03-06	Based on review of CR 756, 12 quality affecting procedures were approved without meeting the applicable QARD requirements.	OR Report No.: OR-03-05	Date Item Closed:
OR Open Item 03-05	The continued use of unqualified software in quality affecting technical products appears to be on conflict with the governing requirements of the implementing procedures and the QARD.	OR Report No.: OR-03-04	Date Item Closed:
OR Open Item 03-04	With a tentative date of mid June to evaluate CAR BSC(B)-03-(C)-107, the RCD has not timely performed action to this CAR, it has remained open for four months without resolution.	OR Report OR-03-03	Date Item Closed: <b>OR Report No.: OR-03-05 January 12, 2004</b>
OR Open Item 03-03	An evaluation in DOE's progress in implementing corrective actions associated with CAR BSC-01-C-001, concerning model validation - the OR reviewed TWPs (approx. 43 models). Based on the results, it could not be established if the evaluation criteria will result in the development of models with adequate confidence for LA.	OR Report No. OR-03-02	Date Item Closed:
OR Open Item 03-02	During a review of the MII confirmation packages, it was identified that the action statement execution task descriptions and completion schedules for many of the reviewed pkgs., had been modified without appropriate justification. Therefore, pending the resolution of this apparent deviation from a commitment to administer the MII in accordance with the requirements of AP-5.1Q, this issue is identified as this OR Open Item.	OR Report No. OR-03-02	Date Item Closed:
OR Open Item 03-01	This Open Item is based on issues on separate DRs: 1) the effective resolution of concerns related to inadequate personnel training; 2) the failure to establish an effective transition plan; and 3) the evaluation of the SCWE issues.	OR Report No.: OR-03-01	Date Item Closed: <b>OR Report No.: OR-03-04 Issue 1 &amp; 2 Closed October 20, 2003</b>

**U.S. NRC On-Site Licensing Representatives' Tracking Report for Open items Followed in Bi-Monthly OR Report**

**TABLE 2**

OR Open Item 02-13	The current status of corrective & preventive actions associated w/CAR #BSC-02-C-01 revealed that not all corrective actions stated had been complete.	OR Report No: OR-02-05	Date Item Closed: <b>OR Report No.: OR 03-05 January 12, 2004</b>
OR Open Item 02-12	Contrary to requirements of the QARD Supplement III 2.4.C procedure AP-SIII.2Q inappropriately allows for the use of unqualified data - BSCQA procedure change control program failed to identify this issue.	OR Report No: OR-02-05	Date Item Closed:
OR Open Item 02-11	Based on surveillance not identifying specific problems w/Soft-ware functionality for codes tested, 7 including NUFT did not pass ITP and/or VTP surveillance.	OR Report No: OR-02-05	Date Item Closed:
OR Open Item 02-10	Pending appropriate evaluation & documentation of the design control attributes associated with requirements of 10CFR §63.44 and Part 21.	OR Report No: OR-02-04	Date Item Closed:
OR Open Item 02-09	Pending revision of engineering procedures, to include appropriate design verification considerations.	OR Report No: OR-02-04	Date Item Closed:
OR Open Item 02-08	The required performance of annual audits' justification for delaying a scheduled audit of YMSCO for 3-months with an additional extension does not appear to be adequately supported. - Deviation from requirement of Sub-section 18.2.1 E of the QARD.	OR Report No: OR-02-04	Date Item Closed: <b>OR Report No.: OR-02-06 January 23, 2003</b>
OR Open Item 02-07	Model Validation Impact Assessment - addressed the effect of inappropriately validated models on TSPA-SR. Many cases of impact assessments used TSPA-SR results to evaluate the local impacts. It's unclear how this practice evaluated the cumulative impact of all the models in question.	OR Report No: OR-02-01	Date Item Closed:
OR Open Item 02-06	Unqualified Data Impact Assessment - NRC staff identified unqualified data that could be replaced with qualified data for the performance assessment. For risk-significant components, an evaluation of unqualified data that is replaced with qualified data would help determine if efforts should be under-taken to qualify the removed data.	OR Report No: OR-02-01	Date Item Closed:

**U.S. NRC On-Site Licensing Representatives' Tracking Report for Open items Followed in Bi-Monthly OR Report**

**TABLE 2**

OR Open Item 02-05	Provisions are in place that allow for model validation to continue past issuance of the documentation. The models used in the performance assessment should have adequate support for their representation at the time the performance assessment documentation is issued.	OR Report No: OR-02-01	Date Item Closed:
OR Open Item 02-04	Number of criteria have been developed related to various forms of review. If a review is relied upon for model validation, it should be directed at validating the model and it should encompass the full body of information to the extent practical.	OR Report No: OR-02-01	Date Item Closed: <b>OR Report No.: OR-03-01 April 14, 2003</b>
OR Open Item 02-03	More objective criteria (comparison to data not used in the development of the model) typically results in higher confidence in model validation are not distinguished from the more subjective, problematic criteria.	OR Report No: OR-02-01	Date Item Closed:
OR Open Item 02-02	Current process controls specify that one or more of 9-criteria may be utilized to validate a model. All of the criteria should increase confidence in the modeling process, some criteria do not appear to be appropriate for addressing whether the model is valid for its intended use.	OR Report No: OR-02-01	Date Item Closed: <b>OR Report No.: OR-03-01 April 14, 2003</b>
OR Open Item 02-01	Failure to properly include the specific issues identified in the Concerns Program Final Report in the resolution process may result in not adequately addressing the original employees concern.	OR Report No: OR-02-01	Date Item Closed: <b>OR Report No.: OR-02-06 January 23, 2003</b>