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YMP-91-07  
Audit Report  
Page 1 of 8

U.S. DEPARTMENT OF ENERGY

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

OFFICE OF QUALITY ASSURANCE

AUDIT REPORT

OF

SANDIA NATIONAL LABORATORIES

AUDIT NUMBER YMP-91-07

CONDUCTED AUGUST 19 THROUGH 23, 1991

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## 1.0 INTRODUCTION

This report contains the results of the annual Quality Assurance (QA) audit of the activities conducted by Sandia National Laboratories (SNL) in support of the Yucca Mountain Site Characterization Project Office (YMPO). The audit was conducted at the SNL facilities in Albuquerque, New Mexico, on August 19 through 23, 1991. The audit was conducted in accordance with the requirements of Quality Assurance Administrative Procedure, QAAP 18.2, "Audit Program," Revision 3. The QA program requirements to be verified were taken from the SNL Nuclear Waste Repository Team (NWRT) Quality Assurance Program Plan (QAPP), Revision E.

## 2.0 AUDIT SCOPE

The scope of the audit was to evaluate the SNL QA program to determine whether it meets the requirements and commitments imposed by the Office of Civilian Radioactive Waste Management (OCRWM), as reflected in the SNL QAPP. This was done by verifying implementation and effectiveness of the program in place, as well as verifying compliance with requirements.

The following program elements were audited to assess compliance with the SNL-NWRT-QAPP, Revision E:

- 1.0 Organization
- 2.0 Quality Assurance Program
- 3.0 Scientific Investigation Control and Design Control
- 4.0 Procurement Document Control
- 5.0 Instructions, Procedures, Plans, and Drawings
- 6.0 Document Control
- 7.0 Control of Purchased Items and Services
- 8.0 Identification and Control of Items, Samples, and Data
- 12.0 Control of Measuring and Test Equipment
- 13.0 Handling, Shipping, and Storage
- 15.0 Control of Nonconformances
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits

The audit scope included a review and evaluation of the following technical activities:

<u>WBS Number</u>	<u>Title</u>
1.2.1.4.7	Supporting Calculations for Post-closure Performance Analyses
1.2.3.2.7.1	Laboratory Thermal Properties

In addition, the above technical activities were evaluated to determine adequacy in the following areas:

1. Technical qualification of scientific investigators and design personnel.
2. Understanding of procedural requirements as they pertain to scientific investigation and design control activities.
3. Adequacy of technical procedures.
4. Development of study plans, work supporting the Site Characterization Plan (SCP), and any related work products (including the final steps in the Exploratory Studies Facility (ESF) Alternative Study).

### 3.0 AUDIT TEAM PERSONNEL AND OBSERVERS

The list of audit team members and observers may be found in Enclosure 1.

### 4.0 SUMMARY OF AUDIT RESULTS

#### 4.1 Program Effectiveness

In the opinion of the Yuca Mountain Quality Assurance Division (YMQAD) audit team, the overall effectiveness of the SNL QA program was satisfactory. However, specific elements of the SNL QA program were identified as either indeterminate (due to lack of implementation) or marginally effective, as noted below.

1. Criterion 12 -- Indeterminate because there is no quality affecting work presently requiring calibrated equipment at SNL.
2. Criterion 13--Indeterminate since there is no quality-affecting hardware presently at SNL.
3. Criterion 15--Indeterminate since there has been no quality-related nonconformance at SNL.
4. Criterion 18--Marginally effective. Based on the documented findings plus those deficiencies corrected during the audit, it seems that SNL QA personnel are rationalizing their own guidelines and thus directing the implementation of quality procedures on courses of action that are contrary to the commitment of those procedures (reference Enclosure 2).

Based on the results of the audit, the SNL QA program is adequate for the continuation of quality-affecting activities. The marginally effective area identified above does not represent a significant breakdown in the QA program, but it does indicate an area where

management attention is needed. The audit team recommends that in-depth SNL internal surveillances or audits be performed in these areas, as well as those areas identified by the YMQAD audit team as deficient (reference Enclosure 5).

#### 4.2 Programmatic Audit Activities

Details of programmatic audit activities are documented in Enclosure 2.

#### 4.3 Summary of Findings

A total of four Corrective Action Requests (CARs) were generated during the course of this audit. Information copies of the CARs are included in Enclosure 5. A synopsis of CARs is presented in Section 7 of this report. Additionally, this synopsis includes seven deficiencies that were corrected during the course of the audit.

### 5.0 SUMMARY OF TECHNICAL AUDIT RESULTS

#### 5.1 Scientific Investigations

Portions of two technical areas were the subject of the integrated technical-programmatic audit. These were conducted by two teams, each consisting of a technical specialist and programmatic auditor. These are presented in the table below:

<u>Specialist/Auditor</u>	<u>WBS</u>	<u>Title</u>
W. Sublette/T. Noland	1.2.3.2.7.1	Mechanical & Thermal Properties
D. Boak/T. Higgins	1.2.1.4.7	Supporting Calculations for Post-closure Performance Analysis

The overall assessment for both areas is that the SNL QA Program has been effectively implemented for the activities examined. This conclusion is based on the assessment of the Technical Specialists combined with the lack of any programmatic findings for either of these areas.

### 6.0 AUDIT MEETINGS

#### 6.1 Pre-audit Conference

A pre-audit conference with the SNL Technical Project Officer (TPO) and his staff was conducted at 9:00 a.m. on August 19, 1991. The

purpose, scope, and proposed agenda for the audit were presented and the audit team was introduced. A list of those attending is attached as Enclosure 3.

#### 6.2 Persons Contacted during the Audit

(See Enclosure 3 for a list of those persons contacted during the audit).

#### 6.3 Post-audit Conference

The post-audit conference was conducted at 1:00 p.m. on August 23, 1991, at the SNL office in Albuquerque, New Mexico. A synopsis of the preliminary CARs identified during the course of the audit was presented to the TPO designee and his staff. A list of those attending the post-audit conference is attached as Enclosure 3.

#### 6.4 Audit Status Meeting

Audit status meetings were held with the SNL TPO (represented by his designee on August 23, 1991) and his key staff at 8:15 a.m. on each day of the audit. A status of how the audit was progressing and identification of discrepancies were discussed.

### 7.0 SYNOPSIS OF CORRECTIVE ACTION REQUESTS AND DEFICIENCIES CORRECTED DURING THE AUDIT

#### 7.1 Corrective Action Requests

CAR No. YM-91-078 Repetitive violations have occurred of the SNL-NWRT-QAPP, Revision E, requirement to issue audit reports within 30 calendar days. Corrective actions have been ineffective, in part, because a conflicting change was made to the implementing procedure Quality Assurance Procedure QAP 18-1, a lower tier document.

CAR No. YM-91-079 Audit Finding and Observation Reports have been issued as "Observations" even though they identify deficient conditions that should be issued as "Findings." Furthermore, Surveillance Reports identified conditions contrary to procedural requirements; yet "recommendations," rather than Deviation Reports, were issued.

CAR No. YM-91-080 The initiators of three Corrective Action Forms did not sign CARs 89-1, 90-4, and 91-1.

CAR No. YM-91-081 A schedule for completion of corrective action was not developed for CAR 89-1, nor was there objective evidence that affected management personnel at all levels were notified about the issuance of this CAR.

## 7.2 Deficiencies Corrected During The Audit

1. SNL QAP 2.5, Revision C, "Training and Familiarization Procedures," calls for a deadline for training to be specified. In several cases the deadline was not met.

This deficiency was corrected by issuing Interim Change Notice (ICN) No. 2 to QAP 2-5. This change requires the training manager to notify the responsible manager or supervisor of delinquent training so that corrective action may be taken.

2. SNL Software Quality Assurance Plan, Revision 0, Section 5.3.1, states, in part, that reporting discrepancies and corrective actions is a part of the modification-or-discrepancy system. However, the implementing procedure SNL Quality Assurance Implementing Procedure QAIP 03-02, Revision 0, does not address this requirement.

This deficiency was resolved by issuing ICN No. 1 to QAIP 03-02 during the audit which addressed the requirements regarding the documentation of deficiencies identified during the software modification process.

3. SNL Department Operating Procedure DOP 2-4, Revision A, Paragraph 4.8.1, states, in part: "The Principal Investigator (PI) will include documentation of the certification in the Analysis Records Package of the analysis for which the software was used." Contrary to this requirement, a copy of the software certification for Excel v2.2 was not in the 75-23 Analysis Record File.

This deficiency was resolved during the audit when a copy of the software certification for Excel v2.2 was acquired and placed in the 75-23 Analysis Record File.

4. SNL QAIP 5-1, Revision 1, "Requirements for Quality Assurance Implementing Procedures," Paragraph 5.2.3, allows major changes to a form that is part of a procedure to be made without the review and approval by the same organizations that performed the original review and approval of the procedure.

This deficiency was corrected by a change to the procedure that provides for the review and approval of a minor change to a QAIP.

5. In accordance with QAIP 4-1, Revision 00, "Procurement Document Requirements," ICN No. 1, a Contract Evaluation Plan, dated June 13, 1990, required three independent evaluations of Teledyne's proposal. Only the QA review took place; there were no formal technical reviews.

This deficiency was resolved in the following manner. Since only one company responded to the request for proposal, the technical reviews were conducted during a visit to Teledyne's facility. The adequacy of the proposal was addressed in the trip report. At the request of the YMQAD audit team, a memorandum to that effect was included in the procurement documents.

6. SNL DOP 8-2, Revision C, "Operation of the SNL NWRT Department Samples Library," requires a notation on change of custody forms for retired samples. Two samples did not have that notation. In addition, the chain of custody form for one sample removed from the sample library could not be found in the Records Management System.

These deficiencies were corrected by the required notations and ensuring that all records were up to date in the record system.

7. SNL-NWRT-QAPP, Revision E, Paragraph 18.6, states, in part, that the audited organization shall be required to investigate adverse audit findings, determine root cause, schedule corrective action, including measures to prevent recurrence. SNL Audit Report No. TEL-A91-1 with respect to Teledyne presented two findings and six observations; however, all responses were made by an SNL person, rather than the subcontractor, and accepted by SNL QA personnel.

This deficiency was resolved by issuing a memorandum for submittal to the file explaining that the contract with the subcontractor expired before corrective actions could be taken. Other supporting documentation was also added to the file.

## 8.0 REQUIRED ACTIONS

Responses to each CAR (delineated in Section 7.0) are due within 20 working days from the date of the CAR transmittal letter. Upon response, and satisfactory verification of all remedial and corrective actions, the CARs will be closed and SNL will be notified (by letter) of the closure.

## 9.0 LIST OF ENCLOSURES

Enclosure 1: Audit Team Members and Observers  
Enclosure 2: Audit Details  
Enclosure 3: Personnel Contacted During the Audit  
Enclosure 4: List of Objective Evidence Reviewed During the Audit  
Enclosure 5: Information Copy of CARS



ENCLOSURE 1

**AUDIT TEAM MEMBERS AND OBSERVERS**

<u>Responsibility</u>	<u>Individual</u>
Audit Team Leader	Neil D. Cox
Audit Manager	James Blaylock
Auditors	Mario R. Diaz
	Donald J. Harris
	Frank J. Kratzinger
	John R. Matras
	Richard L. Maudlin
	Terry W. Noland
	Richard L. Weeks
Lead Technical Specialist/Auditor	Thomas J. Higgins
Technical Specialists	Deirdre M. Boak
	William R. Sublette
Observers	William Belke, (Lead) U.S. Nuclear Regulatory Commission (NRC)
	Robert Brient NRC (Southwest Research Institute)
	Rex Wescott NRC
	Phillip Niedzielski-Eichner Nye County, Nevada
	Englebrecht von Tiesenhausen Clark County, Nevada
	Susan W. Zimmerman Nevada Waste Project Office
	George Vaslos Nuclear Waste Management System (NWMS) Managing and Operating Contractor (M&O)

ENCLOSURE 2

## AUDIT DETAILS

The following is a summary of activities covered during the audit. A list of the objective evidence reviewed during this audit is given in Enclosure 4. Full document identifications for the implementing procedures may also be found in Enclosure 4.

### 1.0 ORGANIZATION

Nine checklist questions were used during the audit of Criterion 1 activities. Satisfactory implementation of Quality Assurance Implementing Procedure QAIP 1-2 was verified. There has been no dispute involving Quality Assurance (QA) personnel that required resolution by higher management. The implementation of requirements was effective.

### 2.0 QUALITY ASSURANCE PROGRAM

Thirty-one checklist questions were used during audit of Criterion 2 activities. Satisfactory implementation of Quality Assurance Procedures QAP 2-5 and 2-7, and Department Operating Procedures DOP 2-6, 2-8, and 2-9 was verified. There has been no instances of an issuance of a stop work order; therefore, the effectiveness of implementation of QAP 1-3, "Quality-Related Work Stoppages," was indeterminate. The implementation of the requirements for Criterion 2 activities was effective.

### 3.0 SCIENTIFIC INVESTIGATION AND DESIGN CONTROL

#### 1. Design Control

There has been no design activity since the last audit, YMP 90-04. Therefore, the effectiveness of the implementation of the following procedures is indeterminate: QAPP, Rev. E, Sections 3.10.1 - 3.18.7; DOP 2-4, Rev. A; DOP 3-1, Rev. E; DOP 3-3, Rev. C; QAIP 3-4, Rev. 00; DOP 3-5, Rev. B; DOP 3-6, Rev. C; DOP 3-9, Rev. D; and DOP 3-10, Rev. B.

#### 2. Scientific Investigation Control

The review of Scientific Investigation Requirements focused on those for quality-affecting work in the Work Breakdown Structure (WBS) elements Supporting Calculations for Postclosure Performance Assessment (WBS 1.2.1.4.7) and Laboratory Thermal Properties (WBS 1.2.3.2.7.1).

The following requirements were found to be effectively implemented:

QAPP, Revision E

Para. 3.1.1	Preparation of Planning Documents
Para. 3.3.3	Review and Approval Process/Planning Documents
Para. 3.7.1	Experiment Control
Para. 3.7.3.2	Technical Procedures
Para. 3.8.1	Interface Control - Coordination
Para. 3.9.1	Verification of Scientific Investigation - Planning
Para. 3.9.3	Reporting Independence/Personnel

DOFs

2-2, Rev. E	Study Plan Requirements
2-3, Rev. A	Work Plans
3-13, Rev. C	Independent Technical and Management Reviews/ Technical Documents

The following requirements were not applicable to the audited work; therefore, the effectiveness of implementation is indeterminate:

QAPP, Rev. E,

Paragraph 3.4.1	Interpretation/Analysis Documents
DOP 02-01, Rev. A	Task Definition Statements
DOP 03-08, Rev. C	Reference Information Base Change Process
DOP 03-11, Rev. A	Requirements for Submitting Data...
DOP 03-17, Rev. 0	Preparing Technical Information Documents

### 3. Software Quality Assurance

Seven potentially quality-affecting computer codes (see Enclosure 4) were selected for review based on the Configuration Management Log, Problem Definition Memos, and Design Investigation Memos. No quality-affecting analyses had been completed at the time of the audit, nor had the seven packages gone through the verification and validation phases of the life cycle. The packages were reviewed for compliance with QAIP 3-2, Rev. 0; and implementation was satisfactory for the current status.

The Configuration Management Log was maintained on a personal computer (PC) using NUTSHELL. This automated tool was highly effective in demonstrating traceability from analysis back through testing, design, requirements, and classification. All documentation appeared complete and accurate.

The corrective action for CAR-90-0035 was reviewed to ensure that the requirements of the Software Quality Assurance Plan (SQAP) had been enforced on the vendor developing software for SNL. A letter issued by SNL to the National Center for Atmospheric Research imposed the requirements of QAIP 3-2, which meets the requirements of the SQAP. SNL will be auditing this vendor in October 1991.

One potential CAR was written, but a change to QAIP 3-2 was made during the audit to eliminate the deficiency. The problem was that the QAIP 3-2 did not point to the discrepancy reporting procedures as required by the SQAP.

#### 4. Exploratory Studies Facility (ESF)

Since the surveillance performed in December 1990 on the Alternative Study, the only activity has been the completion of the Draft Final Report. The procedures that applied to this activity were DOP 2-4, "Analysis Control and Verification"; DOP 3-3, "Analysis Definition Requirements"; and DOP 3-13 "Independent Technical and Management Reviews of Documents." SAND Report 91-0025 and the Analysis Verification package that were reviewed are listed in Enclosure 4. The result of the review in this area was that implementation of the above procedures was satisfactory with the exception of one condition dealing with a record of software certification not being in the Analysis Verification package. This deficiency was corrected during the audit.

In addition, a review of the ESF Final Report, dated June 19, 1991, Volume 1, was performed to determine if the Calico Hills Risk Benefit Analysis had been incorporated. It was found that the Final Report does make reference to this analysis.

#### 4.0 PROCUREMENT DOCUMENT CONTROL

A checklist was developed containing 17 characteristics taken from QAIP 4-1, Rev. 00. The purchasing activities and quality documentation evaluated were preselected from monthly activity reports submitted to YMPO during the previous six months. This resulted in 15 different contract quality procurement record packages for evaluation. Of the 15 contracts, 10 were quality-affecting and 5 were not quality-affecting.

The 10 quality-affecting packages represented a sample of 63 from both quality and nonquality affecting packages. These 10 were evaluated for compliance with the checklist. The only deficiency detected during the examination was corrected during the audit. The deficiency was a deviation from QAIP 4-1, Para. 4.8, "Determining Contractor Awardee," wherein a Bid Evaluation Plan, dated 6/13/91, required three independent evaluations of the suppliers proposal. Only a QA evaluation was performed on the Teledyne RFQ 78-6654 proposal, thus omitting two technical evaluations. Teledyne was the only responder from four requests for proposal. The Contracts Manager terminated the evaluation process and initiated a technical pre-award survey of Teledyne's facilities. The contract was subsequently awarded to Teledyne. When the situation was explained in a memo to the procurement file by L. Shephard, 8/22/91, the deficiency was considered closed.

Four contracts were awarded since the last audit and prior to implementing QAIP 4-1, "Procurement." These contracts were found to contain the proper quality requirements for the "Scopes of Work." Currently, SNL is reviewing other active quality-affecting contracts for proper inclusion of quality requirements as a response to Deficiency Report DR 91-01.

#### 5.0 INSTRUCTIONS, PROCEDURES, PLANS, AND DRAWINGS

Fourteen questions were included on the checklist. Six out of 14 QAIPs were evaluated against the requirements of QAIP 5-1, Rev. 00. These were 01-02, Rev. 1; 02-10, Rev. 0; 04-01, Rev. 0; 05-04, Rev. 0; 08-01, Rev. 0; and 17-02, Rev. 0. One procedure, DOP 2-3, Rev. A, was evaluated for compliance with the Procedure Change requirements. The use of DOP 3-13 review forms was verified for the review of three QAIPs, 01-02, Rev. 0; 04-01, Rev. 0; and 17-02, Rev. 0. No deficiency was found. However, QAIP 5-1, Rev. 0, was found to allow major and minor changes without a review and approval by the original review/approval organization. This defect was corrected during the audit by the appropriate change and issuing the procedure as Revision 1.

Nine out of 26 Technical Procedures (TPs) were evaluated against the requirements of QAIP 5-2, Rev. 00. These were TP 90, TP 92, TP 96, TP 102, TP 200, TP 201, TP 202, TP 206, and TP 207. No deficiency was found.

The QA Supervisor and QA staff assessed the three latest YMPO Administrative Procedure/Quality documents (AP-5.27Q, Rev. 0; AP-6.1Q, Rev. 3; and AP-1.5Q, Rev. 4) for impact and documented the evaluations.

#### 6.0 DOCUMENT CONTROL

The generation, handling, and distribution of controlled documents was verified against the requirements of DOP 6-1, Rev. D. No defect was found.

The review of technical documents by two independent technical reviewers in accordance with DOP 6-2, Rev. B, was verified for SAND 90-0252, SAND 90-2619, and SAND 90-3232.

The review of letter reports by two independent technical reviewers in accordance with DOP 6-2, Rev. B, was verified for SLTR 89-7005, SLTR 90-7004, and SLTR 90-7005. It was verified that these three SLTRs were not referenced in the above three SAND reports.

## 7.0 CONTROL OF PURCHASED ITEMS AND SERVICES

Four questions were contained on the checklist for evaluating the criterion. The same subcontractors and documents that were evaluated in Criterion 4 were utilized for this phase of the audit.

Bechtel National, Inc., JFP Agapita, and RE/SPEC QA programs were evaluated by SNL's QA organization and documented on a QA Compliance Review checklist. Of the remaining suppliers, seven were working under the SNL QA Program by contract. The remaining 5 contracts were designated as not quality-affecting. Program evaluation letters were prepared by QA. The subcontractors were required to resolve concerns. Subsequently the Contract Monitor prepared Program Acceptance letters after all Program Comments were resolved. These letters were signed by QA and the Line Organizations. No deficiencies were noted within this process.

## 8.0 IDENTIFICATION AND CONTROL OF ITEMS, SAMPLES, AND DATA

Thirty-five questions were included on the checklist. These requirements were extracted from QAPP, Rev. E, Section 8; QAIP 8-1, Rev. 00; and DOP 8-2, Rev. C.

There were no quality-affecting samples that have been collected in the last two years.

Verified that when samples are subdivided, each subsample retains, as part of its identification, the original sample identification with additional unique identification appended as necessary.

Reviewed and verified the physical identification of 10 samples. The identification was satisfactory.

Reviewed a letter assigning new numbers to samples collected before 10/31/86 to maintain traceability. The letter is maintained in the Data Records Management System (DRMS).

Verified that samples are maintained in the proper containers.

Except for some problems that were corrected during the audit, verified that chain of custody forms were effectively being used to control the samples and were filed in the DRMS when the samples were in the Samples Library.

Reviewed the Samples Library Log-In and Log-Out Books to verify that the required information was entered properly.



Reviewed the results of the semi-annual check of the contents of the Sample Library. There was a discrepancy in the amount of time between the dates of the checks (10/11/90 to 8/13/91) which was identified by SNL and documented on DR 91-25.

Verified that the Samples Library is contained in a segregated facility which is identified by a sign, is locked, and has limited access.

Reviewed and verified that the latest monthly copying and submittal of the Log-In and Log-Out Logs was made on 9/10/90. This discrepancy was noted by SNL and documented on Deficiency Report 91-24.

Reviewed data set 51/L01A-09/07/82 and SAND Reports 88-1387\*UC-814 and 86-0090\*UC-814 for the proper identification of data.

## 12.0 CONTROL OF MEASURING AND TEST EQUIPMENT

There was no quality-affecting work at SNL; therefore, there were no calibrated instruments to review to verify compliance with the requirements contained in DOP 12-1, Revision D.

There were, however, Certificates of Calibration for equipment at a subcontractor (New England Research) to SNL. Three of four certificates did not contain all of the information required by SNL procedure DOP 12-1. This condition was addressed in a SNL audit finding (AFOR NER 91-03).

## 13.0 HANDLING, STORAGE, AND SHIPPING

There was no quality-affecting hardware at SNL at the time of the audit. Therefore, compliance with the requirements of QAPP, Rev. E, and DOP 13-01, Rev. D, could not be verified.

## 15.0 CONTROL OF NONCONFORMING CONDITIONS

Ten questions were contained in the checklist. These requirements were extracted from QAPP, Rev. E, Section 15, and from QAP 15-1, Rev. A.

No Nonconformance Report had been generated on quality-affecting equipment; therefore, compliance with procedures could not be verified.

## 16.0 CORRECTIVE ACTION

### 1. Corrective Action, QAP 16-01, Rev. B

A total of four Corrective Action Reports (CARs) were examined during the audit (CAR record packages 89-1, 90-3, 90-4, and 91-1). There were no open CARs at the time of the audit. Based on an evaluation of

objective evidence, the process to disposition significant conditions adverse to quality is being implemented satisfactorily. However, as indicated in Corrective Action Requests YM-91-080 and YM-91-081 (issued as a result of this audit) there have been some isolated cases of a "lack of attention to detail" that have resulted in the acceptance of SNL CAR responses that do not completely address all required elements of a response as stated by SNL procedures.

2. Deviation Reporting, QAIP 16-02, Rev. 00

A total of six DRs were examined during the audit (DR record packages 91-01, 91-04, 91-8, 91-12, 91-16, and 91-24). Compliance with procedural requirements was found. A Deviation Report Log is being utilized and maintained as required.

3. Quality Assurance Program Report, QAP 16-3, Rev. A

A review was performed to determine compliance with QAP 16-3, Rev. A. The results indicate that the procedures have been complied with and that implementation is satisfactory.

However, two matters were noted regarding the reviewed documentation. First, a bi-monthly report dated November 1990 identified that SNL management was not being responsive in meeting implementation dates for corrective action. A subsequent bi-monthly report, dated July 1991, restated the same problem and added that this was an ongoing problem. As of the date of this audit, there is no objective evidence to indicate that line management has control of this continuing problem. Verbally, it was stated that measures are presently being taken to gain control of the situation.

The second matter relates to the issuance of a CAR referenced in a semiannual QA Program Report, dated May 1991. This report identified two trends. A draft CAR has been written to address conditions in one of these trends, but it has not been issued as of the date of this audit.

17.0 QUALITY ASSURANCE RECORDS

Thirty-seven questions were contained on the checklist. These requirements were extracted from DOP 17-01, Rev. C, "Records Management System," and from QAIP 17-2, Rev. 00, "Data Records Management System."

A total of 11 record packages were examined for compliance with DOP 17-1. No deficiencies were found, and implementation is considered satisfactory.

Based on the completeness of the examined records, it is evident that SNL record sources and Local Records Center (LRC) personnel are conscientiously implementing records requirements.

A total of four DRMS record packages were examined and found to meet the procedural requirements of QAIP 17-2. Implementation is, therefore, considered adequate. The record packages were 51/L02-07/11/90, Linear Cutting Tests; 51/L02-02/13/91, Effect of Boundary Conditions; 51/L03-01/22/90, Scoping Experiments; and 55/F08-04/11/91, Weapons Test Seismic Studies.

#### 18.0 AUDITS (SURVEILLANCES INCLUDED)

Twenty-seven questions were contained on the checklist, 18 for Audits and 9 for Surveillances. These requirements were extracted from QAP 18-01, Rev. C, "Quality Assurance Audits," and from QAIP 10-01, Rev. 00, "Surveillances."

The Audit Team issued two CARs in this area. Each CAR contains two related deficiencies. In addition, one deficiency was corrected during the audit. These deficiencies, and other matters are presented below.

- o Recurring deviations from the audit report issuance time limit of 30 calendar days have occurred. These were found during audits YMP 90-04 (4 late reports ), YMP 91-07 (4 late reports), and Surveillance YMP-SR-91-016 (2 late reports ). See CAR YM-91-078.
- o Procedure QAP 18-1, Revision C was changed so that it contradicted the upper tier document, QAPP, Revision E. See CAR YM-91-078.
- o Deficiencies have been reported on Audit Finding and Observation Reports (AFORs) as observations rather than findings. See CAR YM-91-079.
- o Deficient conditions identified in Surveillances did not result in DRs, but rather in recommendations. See CAR-91-079.
- o An audit of a subcontractor named Teledyne resulted in two findings as well as six observations. Responses to these conditions were prepared by a SNL person and accepted by SNL QA personnel, rather than by Teledyne personnel. This situation was resolved during the audit by a closure of the contract prior to the initiation of any quality-affecting work.
- o The AFOR is a mechanism utilized by SNL to issue findings or observations that have been identified during an audit; yet nowhere within the audit procedure (QAP 18-1, Rev. C) is there any mention of the AFOR form or a method by which it is issued and dispositioned.

- o The interpretation of requirements showed a weakness. During the audit, an auditor pointed out that overrunning a specific training date deadline was a deficiency. The SNL QA person on hand maintained that the training date deadline was not a requirement despite the fact that such a deadline was called out in QAP 2-5, Rev. C, Para. 4.4.1. (This deficiency was corrected during the audit by ICN 2 to QAP 2-5, Rev. C.)

Based on the above results, the effectiveness of implementing the Audit and Surveillance procedures is considered marginal.

#### TECHNICAL ACTIVITIES

##### 1. WBS 1.2.1.4.7, "Support Calculations for Post-Closure Performance Analysis"

The technical audit of WBS element 1.2.1.4.7 focused on the recently completed technical activities that will be reported by SAND91-0791, "Movement of Shaft and Drift Construction Water in Yucca Mountain, Nevada - An Extended Study," by S.R. Sobolik, M.E. Fewell, and R.R. Eaton. This work was chosen for technical audit because it is complete and was performed under the QA program controls applied to quality-affecting work, the task has practical application in ESF design/construction, and the results appear in Appendix I of the Exploratory Studies Facility Design Requirements (ESF-DR) document.

The technical specialist concluded that the task's product, design goal recommendations for the ESF-DR document, fulfills the purpose of this study. The methodology used will be defensible in a licensing review and is consistent with similar YMP technical work. These conclusions are based on a review of SAND91-0791 and the references cited therein, procedures, the controlling planning document (Work Plan 12147), working files, computer output, and extensive interviews with S.R. Sobolik and M.E. Fewell.

##### 2. WBS 1.2.3.2.7.1, "Thermal and Mechanical Properties"

The technical audit of WBS element 1.2.3.2.7.1 examined quality-affecting work performed by subcontractor New England Research (1.2.3.2.7.1.3). Also the traceability of thermal conductivity (1.2.3.2.7.1.1) and thermal expansion (1.2.3.2.7.1.2) rock property values, as found in the Reference Information Base (RIB), to their source documents was examined, although the values were stated clearly as "not collected under an approved QA program."

The work performed by New England Research is controlled by appropriate and adequate experimental and technical procedures that were in place prior to the initiation of work. Overall, the performance of the subcontractor on the quality affecting work examined was found to be very encouraging.

The attempt to verify the traceability of rock thermal properties from the RIB to their source documents was not successful. Numerous traceability and documentation problems were noted. The following are some of the thermal expansion traceability and documentation problems that were identified while checking samples G1-740 and G2-1198):

- o There were no test procedures referenced in either the raw data sets (51/L01B-10/7/81 and 51/L01B-4/21/81), the data compilation sheets (B.M. Schwartz in preparation), the data calculation memorandum (Rutherford to Nimick dated May 3, 1988), or the RIB (1.2.3. Ver. 4, Rev. 0, 2/1/89). The tests were apparently performed by Terra Tek and they have their own procedures, but there is no reference to that fact.
- o The RIB's near-field coefficient of thermal expansion values are identified as TSw2; however, thermal expansion data from TSw1 were also used in calculating the TSw2 values presented in the RIB. If these data are combined, at least a footnote should be provided in the RIB noting this fact.
- o The data analysis memorandum (Rutherford to Nimick dated May 3, 1988) did not consider all the data from the raw data sets (51/L01B-10/7/81 and 51/L01B-4/21/81) and the data compilation sheets (B.M. Schwartz in preparation) when the thermal expansion values were calculated. There was no explanation or justification for the selective use of these data.
- o No calculation sheets existed for the coefficient of thermal expansion data.
- o Data compilation and calculation checks were performed in 1989 by technical consultants; and their values are not found to be consistent with those values presented in the previously referenced data compilation sheets and data analysis memoranda.
- o Documentation in the previously referenced data compilation sheets was not complete. Sample identification numbers were not adequately identified. The thermal/mechanical stratigraphic units for each sample were also not identified.
- o No documentation existed on the review of the analysis memorandum (Rutherford to Nimick dated May 3, 1988).

The following provides a summary of some of the problems identified when tracing the thermal conductivity values from the RIB to their source documents:

- o Inadequate documentation of the thermal/mechanical unit identification in the data compilation report (SAND 88-0624) and the data analysis report (SAND 86-0090).

- o The calculation sheets for the thermal conductivity values were not in the DRMS. These calculation sheets were located in F.B. Nimick's files. There was also inadequate documentation of the thermal conductivity calculations. Examples of this included: units not being identified, calculation equations not presented, and no signature or date on calculation sheets.

ENCLOSURE 3

**SANDIA NATIONAL LABORATORIES  
 YMP-91-07 AUDIT ROSTER**

<u>Name</u>	<u>Organization</u>	<u>Title</u>	<u>Pre-</u> <u>Audit</u>	<u>Contacted</u> <u>During</u> <u>Audit</u>	<u>Post-</u> <u>Audit</u>
Allen, Anita	Sandia (6318)	Records Analyst			X
Arana, C.R.	Sandia (4301)	SNL Quality	X		
Askew, Steven	Sandia (6316)	Software Coordin.	X	X	X
Barnes, C.A.	MACTEC (6319)	Quality Engineer		X	
Barr, Douglas	Sandia (6318)		X		X
Bauer, Stephen	Sandia (6313)	SMTS	X		
Beeler, Michael N.	Sandia (4301)	SNL Quality	X		
Belke, William	NRC	Observer	X		X
Bingham, Felton W.	Sandia (6312)	Supervisor	X	X	X
Blaylock, James	DOE/YMQAD	Audit Manager	X		X
Blejwas, Thomas E.	Sandia (6310)	TPO	X	X	
Boak, Deirdre M.	SAIC/T&MSS	Sr. Engineer	X		X
Bray, David	Sandia (4301)	SNL Quality	X		
Brient, Robert D.	NRC/SRI	Observer	X		X
Castagnia, Iris	Sandia (6318)	Records Technician			X
Cheek-Martin, Francis	Sandia			X	
Costin, Laurence S.	Sandia (6313)	Supervisor	X	X	X
Cox, Neil D.	SAIC/YMQAD	Audit Team Leader	X		X
Dennis, Al	Sandia (6311)	SMTS	X	X	X
Diaz, Mario R.	DOE/YMQAD	Auditor	X		X
Eastman, Linda	SAIC	Sr. Training Analyst	X		X
Erickson, Linda	Sandia (6318)	Tech. Repts. Mgr.	X		X
Fewell, M.E.	Sandia (6313)	Task Leader 12147	X		X
Garcia, Magdalena	Sandia (6318)	Records Technician	X		X
Gruer, Earl	Sandia (6311)	Design Engineer	X		
Hann, James H.	Sandia (6318)	MA	X		
Harris, Donald J.	Harza/YMQAD	Auditor	X		X
Hawkinson, David R.	MACTEC (6319)	Quality Engineer	X	X	
Hersum, Taber	MACTEC (6319)	Quality Engineer		X	X
Higgins, Thomas J.	SAIC/YMQAD	Lead Tech Spec/Auditor	X		X
Hotchkiss, Alice	Sandia (6318)	Records Manager	X	X	X
James, Eloise	GCI	Records Technician	X		X
Kratzinger, Frank J.	SAIC/YMQAD	Auditor		X	X
LaPorte, Leigh	LATA/SNL	Eng. Asst.	X	X	X
Letz, Jerry A.	Sandia (6319)	QA Engineer	X	X	X
Lewis, Barbara	Sandia (6319)	Database Tech.	X	X	X
Macer, Robert J.	Sandia (6318)	Analyst II		X	X
Martinez, M.	Sandia	PHST Student			X
Matras, John R.	SAIC/YMQAD	Auditor	X		X
Maudlin, Richard L.	MACTEC/YMQAD	Auditor	X		X
Miller, Warren	Sandia (6316)	Software Coordinator	X	X	X
Montano, Susan	Sandia	Secretary			X



**SANDIA NATIONAL LABORATORIES**  
**YMP-91-07 AUDIT ROSTER**

<u>Name</u>	<u>Organization</u>	<u>Title</u>	<u>Pre- Audit</u>	<u>Contacted During Audit</u>	<u>Post- Audit</u>
Niedzielski-Eichner, P.	Nye County NV	Observer	X		
Nimick, Fran	Sandia (6315)	Supervisor (Acting)	X	X	X
Noland, Terry W.	SAIC/YMQAD	Auditor			X
Orth, Tamara	Sandia (6318)	Budget Coordinator	X	X	X
Ostrander, Mary L.	GCI	Records Coordinator	X	X	X
Price, Ronald H.	Sandia (6315)	Task Leader/PI	X		X
Richards, R.R.	Sandia	QA Supervisor	X	X	X
Ryder, Eric	Sandia (6313)	MTS	X		
Sanchez, Kassi	Sandia (6318)	Admin. Support	X		X
Sandoval, Robert P.	Sandia (6316)	Supervisor	X	X	X
Selph, Emelda R.	Sandia			X	
Schelling, F. Joseph	Sandia (6316)	Task Leader 12133	X	X	X
Sharpton, Sarah E.	Sandia (6318)	Supervisor	X	X	X
Shephard, L.E.	Sandia (6310A)	Supervisor	X	X	X
Smit, Gene	Sandia	SNL QA	X	X	X
Sublette, William	SAIC/T&MSS	Tech. Specialist	X		
Sobolik, S.R.	Sandia			X	
Tang, Mary	Sandia (6318)	Training Manager	X	X	X
Thomas, Jessica C.	Teledyne (6318)	Data Base Tech.	X		X
Tiesenhausen, E. von	Clark County	Observer			X
Tipton, Gary	Sandia (6316)	SMTS		X	
Vaslos, George P.	NWMS M&O	Observer	X		X
Voigt, James V.	MACTEC (6319)	Quality Engineer	X	X	X
Wash, Debra	Sandia (6318)	Records Technician		X	X
Weeks, Richard L.	SAIC/YMQAD	Auditor	X		X
Wernig, Mike	Sandia (6316)	Tech. Reviewer	X		
Wescott, Rex G.	NRC	Observer	X		X

ENCLOSURE 4

## OBJECTIVE EVIDENCE REVIEWED DURING AUDIT

(Examples of)

### Plans

SNL-NWRT-QAPP, Revision E	Quality Assurance Program Plan
SNL NWRT SQAP, Revision 0	Software Quality Assurance Plan

### Quality Procedures

QAIP 1-2, Revision 1	Organization
QAP 1-3, Revision A	Quality-Related Work Stoppages
QAIP 1-4, Revision 0	Resolution of Quality Assurance Disputes
ICN 01	
ICN 02	
DOP 02-01, Revision A	Task Definition Statements
ICN 01	
ICN 02	
ICN 03	
DOP 02-02, Revision E	Study Plan Requirements
ICN 01	
DOP 02-03, Revision A	Work Plans
ICN 01	
ICN 02	
ICN 03	
DOP 02-04, Revision A	Analysis Control and Verification
ICN 01	
QAP 2-5, Revision C	Training and Familiarization Procedures
ICN 01	
DOP 2-6, Revision D	Qualification and Certification of Personnel
ICN 01	
ICN 02	
QAP 2-7, Revision D	Qualification of Quality Assurance Audit Personnel
ICN 01	
DOP 2-8, Revision A	Conduct and Reporting of Management Assessments
ICN 01	
ICN 02	
DOP 2-9, Revision A	Preparedness Review
QAIP 02-10, Revision 00	Determination of Applicable QA Controls
ICN 01	
DOP 03-01, Revision E	Preparing, Reviewing, Approving, and Issuing
ICN 01	Issuing Engineering Drawings
QAIP 03-02, Revision 00	Software Quality Assurance Requirements
DOP 03-03, Revision C	Analysis Definition Requirements
ICN 01	
ICN 02	

QAIP 03-04, Revision 00	Design Investigation Control
ICN 01	
ICN 02	
DOP 03-05, Revision B	Design Control and Verification
ICN 01	
ICN 02	
DOP 03-06, Revision C	Design Change Control
ICN 01	
ICN 02	
DOP 03-08, Revision C	Reference Information Base Change Process
DOP 03-09, Revision D	Interface Control of NWRT Engineering
DOP 03-10, Revision B	Routine Calculations
ICN 01	
DOP 03-11, Revision A	Requirements for Submitting Data to the YMP
ICN 01	Project Site and Engineering Properties
ICN 02	Data Base (SEPDB).
DOP 03-13, Revision C	Independent Technical and Management
ICN 01	Reviews of Documents
DOP 03-17, Revision 0	Preparing Technical Information Documents
ICN 01	
QAIP 04-01, Revision 00	Procurement
ICN 01	
QAIP 05-01, Revision 00	Requirements for QA Implementing Procedures
ICN 01	
ICN 02	
QAIP 05-02, Revision 00	Technical Procedure Requirements
ICN 01	
ICN 02	
ICN 03	
QAIP 05-04, Revisions 00	Use of Yucca Mountain Project Quality-Related
	Administrative Procedures (AP-Qs)
DOP 06-01, Revision D	Document Control System
ICN 01	
ICN 02	
DOP 06-02, Revision B	Reviewing, Approving, and Issuing Technical
ICN 01	Information Documents
ICN 02	
ICN 03	
ICN 04	
ICN 05	
QAIP 08-01, Revision 00	Sample Identification and Handling
	Requirements
DOP 08-02, Revision C	Operation of the SNL NWRT Department
ICN01	Samples Library
QAIP 10-01, Revision 00	Surveillances
DOP 12-01, Revision D	Measuring and Test Equipment Control
ICN 01	
ICN 02	
DOP 13-01, Revision D	Identification, Handling, Shipping, and
	Storage of Items

QAP 15-01, Revision A	Nonconformance Control and Reporting
QAP 16-01, Revision B	Corrective Action
QAIP 16-02, Revision 00	Deviation Reporting
QAP 16-03, Revision A	Quality Assurance Program Report
DOP 17-01, Revision C	Records Management System
ICN 01	
ICN 02	
ICN 03	
QAIP 17-02, Revision 00	Data Records Management System
QAP 18-01, Revision C	Quality Assurance Audits
ICN 01	
ICN 02	
ICN 03	

Study Plans, Technical Procedures, and Experimental Procedure

SP 8.3.1.15.1.1

SP 8.3.1.15.1.2

SP 8.3.1.15.1.3

Technical Procedures TP-90 through TP-96, all Revision 1

Experimental Procedure EP-0002, Revision D, and review documentation

Work Plans and Supporting Documents

WP 12147, Rev. 0	WBS Element 1.2.1.4.7, Supporting Calculations for Postclosure Performance Analysis
TDS 1510, Rev. 00	Task Definition Statement: Code Development, Analysis, and Experimental Support
PDM 72-30, Rev. 00	Problem Definition Memo: ESF Analysis #2 - Effects of Shaft Construction Water on Experiments in ESF
RMS SL# 025579	Letter dated 12/06/90, L.E. Shephard to F.C. Lauffer, Analysis Review Plan for PDM 72-30, Rev. 0 (Analysis Review Notice)
RMS SL# 025927	Letter dated 1/11/91, L.E. Shephard to F.C. Lauffer, Modifications to Analysis Review Plans for PDMs 72-28, 72-29, 72-30, and 72-31
RMS SL# 026169	Letter dated 1/25/91, L.E. Shephard to F.C. Lauffer, Change in Analysis Review Committee Membership
RMS SL# 130203	Letter dated 4/18/91, F.C. Lauffer and T.E. Hinkebein to L.E. Shephard, Analysis Verification Review for PDM 72-30
RMS SL# 130387	Records Package for PDM 72-30, ESF Analysis #2 - Effects of Shaft and Drift Construction Water: Assumptions Used in the Implementation of the Analysis, 98 total pages, 6 items. Authenticated 5/02/91.

Computer Files

SHAFTTSN.OUT 11/29/90 0845: Calculation for a Shaft in Topopah Springs Formation without Ventilation and 15% Retention

SHAFTTSR.OUT 11/29/90 1542: Calculation for a shaft in Topopah Springs Formation with Ventilation and 15% Retention

SHAFTCHR.OUT 12/03/90 0832: Calculation for a Shaft in Calico Hills Formation with Ventilation and with 15% Retention

Training Files

S.R. Sobolik            Personnel Qualification form (DOP 2-6, Rev. D, Appendix A) Training Snapshot (database report of individual training requirements completion status)

M.E. Fewell            Personnel Qualification form Training Snapshot

T.E. Hinkebein        Personnel Qualification form Training Snapshot

L.C. Lauffer           Personnel Qualification form Training Snapshot

Technical Documents

WP 1.2.3.2.7.1        WBS Element 1.2.3.2.7.1, Mechanical and Thermal Properties  
SAND 88-1387  
SAND 86-0090  
SAND 90-0252  
SAND 90-2619  
SAND 90-3232  
SAND 91-0025 and reviews  
SAND 91-0791

ESF Draft Final Report for ESF Alternative Study, dated June 19, 1991

Reference Information Base (1.2.3 Ver.4, Rev.0) Rock Linear Thermal Expansion  
Reference Information Base (1.2.2 Ver.4, Rev.1) Rock Thermal Conductivity

Rutherford, B. M., May 3, 1988. "Statistical Analysis of Yucca Mountain Thermal Expansion Data," memorandum to F. B. Nimick, Sandia National Laboratories, Albuquerque, NM.

Schwartz, B. M., (in preparation). "Thermal Expansion Data for Unsaturated Tuffs From Yucca Mountain, Nevada," SAND88-1581, Sandia National Laboratories, Albuquerque, NM.

Nimick, F. B., 1989. "Thermal-Conductivity Data for Tuffs from the Unsaturated Zone at Yucca Mountain, Nevada," SAND88-0624, Sandia National Laboratories, Albuquerque, NM (YMP CRF Accession Number: NNA.890515.0133).

Nimick, F. B., 1990b. "The Thermal Conductivity of the Topopah Spring Member at Yucca Mountain, Nevada," SAND86-0090, Sandia National Laboratories, Albuquerque, NM (YMP CRF Accession Number: NNA.890516.0183).

Study Plan 8.3.1.15.1.3, "Laboratory Determination of Mechanical Properties of Intact Rock".

#### Letter Reports

SLTR 89-7005  
SLTR 90-7004  
SLTR 90-7005

#### Audit Reports and Surveillance Reports

SNL-A91-1	HOLO-A91-1	JVV 91-02
TEL-A91-1	PB-A91-1	JVV 91-03
ORNL-A91-1	JVV 91-01	JVV 91-04

#### Data Set and Samples

BB-10AE-58-SNL	SPC 4359
BB-10AE-58-SNL-A1	G1-1306.3-1-SNL
BB-10AE-58-SNL-W	C-SNL-TC/5 thru 16
BB-10AE-60-SNL	BB-10AE-19X-SNL
BB-10AE-60-SNL-A1	G1-1373.2-1374.1
BB-10AE-60-SNL-A2	CRPP-6-SNL
BB-10AE-60-SNL-A3	CRPP-21-SNL
USW-G2-2682.8-26 SNL	BB-10AE-50W-SNL
USW-G1-1729.9-1730.8	G1-1450.2-1-SNL
G4-749.0-A	BB-10AE-37X-SNL
BB-10AE-51Y	BB-10AE-40Z-SNL
CRPP-25-SNL	CRPP-1 thru 31-SNL
CRPP-3-SNL	BB-10AE-61WX-SNL
USW-GU3	BB-10AE-10A TOP-SNL
BB-11A1	USW-643.298.0
BB-10AE-6Z-SNL	

#### Technical Procedures and ICNs

TP-90 ICN 1	TP-102 ICN 2	TP-202, Rev. 0
TP-92 ICN 1	TP-200 ICN 1	TP-206, Rev. 0
TP-96 ICN 1	TP-201, Rev. 0	TP-207, Rev. 0

Record Packages

RMS SL# 026035	RMS SL# 113908	RMS SL# 130636
RMS SL# 026036	RMS SL# 113909	RMS SL# 130548
RMS SL# 026338	RMS SL# 113910	RMS SL# 130617
RMS SL# 026799	RMS SL# 113911	

CAR 89-1	CAR 90-4
CAR 90-3	CAR 91-1

DR 91-01	DR 91-08	DR 91-16
DR 91-04	DR 91-12	DR 91-24

Semiannual QA Program Reports, dated May, 1991  
Bi-monthly reports dated 11/30/90, 1/19/91, 4/29/91, 5/17/91 and 7/3/91

DRMS Record Packages

51/L02-07/11/90	Linear Cutting Tests
51/L02-02/13/91	Effect of Boundary Conditions
51/L03-01/22/90	Scoping Experiments
51/F08-04/11/91	Weapons Test Seismic Studies

SNL Administrative Procedure Forms

AP 5.27Q, Rev. 0  
AP 6.1Q, Rev. 2 & 3  
AP 1.5Q, Rev. 4

SNL Request for Distribution/Recall of Controlled Document forms

ITM-016, Rev. 0	QAIP 16-2, Rev. 0
WP 12126 FY-91, Rev. 0	DIM 259 Rev. 0
DOP 17-1, Rev. C, ICN	EP 0041, Rev. 0
TP 207, Rev. 0	DOP 3-10, Rev. B
DIM 244 Rev. B	

SNL Controlled Document Recall and Acknowledgment forms

S. Hall (QAIP 05-01, Rev. 0)  
C. Sitre-Soto (DOP 17-1 ICN 4 and QAPD Rev. 0)  
E. Gruer (DIM 058, Rev. 0)  
R. Richards (QAPD, Rev. 0)  
J. Gibsen (QAIP 02-10 ICN 2)  
A. Treadway (DOP 06-01 ICN 1)



SNL Request to be Added To/Deleted From Controlled Document Distribution forms

C. Foreman dated 8/16/91  
A. Bouillard dated 8/13/91  
R. Richards dated 8/16/91

Correct Controlled Documents in the work place for:

S. Edmund  
L. Erikson

Certificates of Calibration (off-site equipment)

S/N 37020096	Sartorius Model L610D
S/N A 7719	Becker Model AB-2
S/N HP 3465A	1621A12958 Voltmeter
S/N K 758	Load Cell

Other Objective evidence

6/3/91 Master List of Controlled Documents  
8/1/91 Master List of Controlled Documents  
Controlled Document Distribution Database  
Letter Report Log  
Memorandum of Understanding (IMOU) for WBS 1.2.6, dated 6/15/90  
DOE Letter, C.P. Gertz to T.O. Hunter, dated 9/4/90  
Problem Definition Memo (PDM) 75-23, R0, dated 9/24/90  
PDM 75-23, R1, dated 5/14/91  
PDM 72-28  
PDM 72-29  
PDM 72-30  
PDM 72-31  
PDM 75-001  
PDM 75-13  
PDM 77-01  
DIM 218  
DIM 219  
SNL CAR-90-02  
Contract 35-0035  
Software Configuration Management Log

Software Document Checklists and Documentation Packages for:

WBS 1.2.3.2.8.3.2      PPICKNTS 1.0 and 1.1  
                              READFILE 1.0  
                              BAR 1.0  
 WBS 1.2.6.1.1 ---      EXCEL 2.2  
 WBS 1.2.4.2.3.2 --      STRESS3D 4.0  
 WBS 1.2.1.4.7 --      NORIA-SP 0.0  
 ESF3\_TSATO

Sample Chain-of-Custody Forms  
 Sample Log-in Book  
 Sample Log-out Book  
 Semi-annual check reports of Sample Library  
 Monthly reports of the submittal of copies of the Log-in and Log-out books

Supplier Contracts

<u>Company Name</u>	<u>Purchase Document</u>	<u>Not Quality Affecting</u>
Applied Decision Analysis, Inc.	35-0013	
Bechtel National Inc.	23-9599	
Colorado School of Mines-Earth Mechanics	35-0039	X
Geomatrix	75-4350A	
Holometrix	05-6677A	
International Technology Corp.	54-1050A	X
J.F.P. Agapito & Assocs.	42-0096	
Los Alamos Technical Assocs.	23-9587	X
National Center for Atmospheric Research	35-0035	
New England Research	05-6677B	
Parsons, Brinckerhoff, Quade & Douglas	18-1499	
Teledyne	78-6654	
RE/SPEC	78-6653	
University of Colorado	35-0064	X
University of New Mexico	54-1058	X

ENCLOSURE 5

<b>OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C.</b>		14 CAR NO.: <u>YM-91-078</u> DATE: <u>8/28/91</u> SHEET: <u>1</u> OF <u>2</u> <div style="text-align: center;">QA</div> WBS No.: <u>1.2.9.3</u>
<b>CORRECTIVE ACTION REQUEST</b>		
1 Controlling Document SNL-NWRT-QAPP, Rev. E		2 Related Report No. Audit YMP-91-07
3 Responsible Organization Sandia National Lab	4 Discussed With R. R. Richards	
10 Response Due 20 days from issue	11 Responsibility for Corrective Action R. R. Richards	12 Stop Work Order Y or N No
5 Requirement: QAPP, Revision E, Section 18.5.1 states in part, "The audit report shall be compiled by the audit team, signed by the Lead Auditor, and issued in 30 calendar days...."		
6 Adverse Condition: <p>Contrary to the above requirement, ICN No. 1 to implementing procedure QAP 18-1, Revision C removes the requirement to issue audit reports in 30 calendar days and thus conflicts with the controlling document. This ICN provides no guidance for timely issuance of the audit reports and has caused at least 6 violations of the QAPP requirement.</p> <p>Repetitive violations of the audit report issuance time limit of 30 days have occurred. These were found during audits YMP-90-04 (4 late reports), YMP-91-07 (4 late reports) and Surveillance YMP-SR-91-016 (2 late reports). Past corrective actions have been ineffective.</p>		
7 Recommended Action(s): Identify the remedial action(s) to be taken to correct the deficiencies noted in Block 6. Investigate the program process, activities of documentation to determine the extent and depth of similar deficient conditions. Identify these deficiencies and provide the measures required to		
8 Initiator R. L. Weeks      8/28/91 <i>Richard L. Weeks</i>	9 Severity Level - 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	13 Approved By:      Date: OOA <i>Catherine H. Houghton</i> 8-28-91
15 Verification of Corrective Action:		
16 Corrective Action Completed and Accepted: OAR _____ Date _____		17 Closure Approved By: OOA _____

**OFFICE OF CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.**

CAR NO.: YM-91-078  
DATE: 8/28/91  
SHEET: 2 OF 2

**CORRECTIVE ACTION REQUEST  
(continuation sheet)**

**7 Recommended Action(s) (continued)**

correct them. Identify the cause of the condition and the planned corrective action to prevent recurrence.

<b>OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C.</b>		14CAR NO.: <u>YM-91-079</u> DATE: <u>8/28/91</u> SHEET: <u>1</u> OF <u>2</u> QA WBS No.: <u>1.2.9.3</u>
<b>CORRECTIVE ACTION REQUEST</b>		
1 Controlling Document QAP 16-1, Revision C, ICN 03		2 Related Report No. Audit YMP-91-07
3 Responsible Organization Sandia National Lab	4 Discussed With R. Richards	
10 Response Due 20 days from issue	11 Responsibility for Corrective Action R. R. Richards	12 Stop Work Order Y or N
5 Requirement:  <p>QARD, Revision 4, Section 16, Paragraph 16.0 states, "The provisions of NQA-1 Basic Requirement 16 shall apply with the following amplifications."</p> <p>QAPP, Revision E, Paragraph 16.1 states, "A corrective action system is defined herein that ensures that conditions adverse or potentially adverse to quality are identified promptly and corrected as soon as practical."</p> <p>QAP 18-1, Revision C, ICN 03, Sections 3.3 and 3.4 state the following:</p> <p>3.3 Finding - A statement of fact regarding noncompliance with established policies, procedures,</p>		
6 Adverse Condition:  <p>Audit Finding and Observation Reports (AFORs) have been issued as "Observations" even though they identify a deficient condition and should be issued as a "Finding". Examples are as follows:</p> <p>NER-91-03          NER-91-04          AFORs identified in Oakridge Audit (ORNL-A91-1)</p> <p>Surveillance Reports were issued which identified conditions that were not in compliance with procedural requirements however, Deviation Reports were not issued but rather recommendations were made to document the violations. Examples are as follows:</p> <p>Surveillance Reports JVV 91-02, JVV 91-03, JVV 91-04 and CEF 91-01.</p>		
7 Recommended Action(s):  <p>Identify the remedial action(s) to be taken to correct the deficiencies noted in Block 6. Investigate the program process, activities or documentation to determine the extent and depth of similar deficient conditions on the CAR. Identify these deficiencies and provide the measures</p>		
8 Initiator M.R. Diaz R.L. Weeks <i>Richard L. Weeks</i>	Date: 8/28/91	9 Severity Level - 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/>
13 Approved By: OQA <i>Catherine M. Thompson</i>		Date: 8-28-91
15 Verification of Corrective Action:		
16 Corrective Action Completed and Accepted:  OAR _____ Date _____		17 Closure Approved By:  OQA _____

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CAR NO.: YM-91-079  
DATE: 8/28/91  
SHEET: 2 OF 2

**CORRECTIVE ACTION REQUEST**  
(continuation sheet)

5 Requirements (continued)

instructions, drawings, or other applicable requirements. (Findings require a documented response specifying corrective action and verification of its accomplishment.)

3.4 Observation - A statement of opinion regarding a potential quality problem, quality assurance program weakness or practice which could lead to a finding if not corrected. (Observations require a documented response specifying corrective action.)

QAP 10-1, Revision 0, Section 3.4.2 states, "Any activity that is found to be in noncompliance with requirements will be documented on SNL NWRT Deviation Report (DR) in accordance with QAP 16-2."

7 Recommended Action(s) (continued)

required to correct them. Identify the cause of the condition and the planned corrective action to prevent recurrence.

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14CAR NO.: YM-91-080  
DATE: 8/28/91  
SHEET: 1 OF 1  
**QA**  
WBS No.: 1.2.9.3

**CORRECTIVE ACTION REQUEST**

1 Controlling Document QAP 16-1, Revision B		2 Related Report No. Audit YMP-91-07	
3 Responsible Organization Sandia National Lab		4 Discussed With R. Richards	
10 Response Due 20 days from issue	11 Responsibility for Corrective Action R. R. Richards		12 Stop Work Order Y or N No
5 Requirement: QAP 16-1, Revision B, Section 4.1.2 states in part, "On Part I of the Corrective Action Form (similar to or identical to Appendix A), the initiator shall describe the condition, and sign and date where indicated...."			
6 Adverse Condition: Contrary to the above requirement, the initiator did not sign, where indicated, on the CAR forms for the following CARS: 89-1, 90-4 and 91-1.			
7 Recommended Action(s): Obtain signatures of appropriate initiators as required by the procedure. Amend record package.			
8 Initiator R. L. Weeks      Date: 8/28/91 <i>Richard L. Weeks</i>		9 Severity Level - 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/>	13 Approved By: OQA <i>Catherine Thompson</i> 8-28-91
15 Verification of Corrective Action:			
16 Corrective Action Completed and Accepted: OAR _____ Date _____		17 Closure Approved By: OQA _____	



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14CAR NO.: YM-91-081  
DATE: 8/28/91  
SHEET: 1 OF 1  
QA  
WBS No.: 1..2.9.3

**CORRECTIVE ACTION REQUEST**

1 Controlling Document QAP 16-1, Revision B		2 Related Report No. Audit YMP-91-07	
3 Responsible Organization Sandia National Lab		4 Discussed With R. Sandoval/R. Richards	
10 Response Due 20 days from issue	11 Responsibility for Corrective Action R. R. Richards	12 Stop Work Order Y or N No	
5 Requirement:  QAP 16-1, Revision B, Section 4.2.1 states in part, "...Organizations or personnel responsible for implementation of these actions will be identified, and a schedule for completion of the corrective action will be developed...."  QAP 16-1, Revision B, Section 4.1.4.1 states in part, "...Affected management personnel at all levels shall be notified of the CAR."			
6 Adverse Condition:  Contrary to the above requirements, the following conditions were not met:  1) a schedule for completion of corrective action was not developed for CAR 89-1 2) there is no objective evidence that affected management personnel at all levels were notified that CAR 89-1 was issued.			
7 Recommended Action(s):  Conduct an analysis of the identified condition to determine impact on the disposition of CAR 89-1. Document this analysis and amend record package.			
8 Initiator R. L. Weeks <i>Richard L. Weeks</i>	Date: 8/28/91	9 Severity Level - 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/>	13 Approved By: OQA <i>Catherine Hampton</i> 8-28-91
15 Verification of Corrective Action:			
16 Corrective Action Completed and Accepted:  QAR _____ Date _____		17 Closure Approved By:  OQA _____	