U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
OFFICE OF QUALITY ASSURANCE

AUDIT REPORT

OF

LOS ALAMOS NATIONAL LABORATORY

LOS ALAMOS, NEW MEXICO
AND
LAS VEGAS, NEVADA

AUDIT NUMBER YMP-93-02
NOVEMBER 2-6, 1992

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1.0 EXECUTIVE SUMMARY

As a result of Quality Assurance (QA) Audit YMP-93-02, the audit team determined that Los Alamos National Laboratory (Los Alamos) is satisfactorily implementing an effective QA program in accordance with the Los Alamos QA Program Plan and implementing procedures for QA program elements 8.0 "Identification and Control of Materials, Parts, and Components", 19.0 "Computer Software", and 20.0 "Scientific Investigations".

There was insufficient activity to make a determination of the effectiveness of the following QA program elements: 3.0 "Design Control", 4.0 "Procurement Document Control", and 7.0 "Control of Purchased Items and Services".

There was no activity for the following QA program elements: 10.0 "Inspection", 11.0 "Test Control", and 15.0 "Control of Nonconforming Items".

The technical portion of the audit revealed no discrepancies and was considered to be satisfactorily implemented.

The audit team identified three deficiencies during the course of the audit. Of these, one was corrected prior to the post-audit meeting. Two of the deficiencies resulted in the issuance of Corrective Action Requests (CARs). CAR YM-93-018 concerned the failure of Los Alamos to follow a software procedure for Software Configuration Management (SCM) Audits if an audit item is identified. CAR YM-93-019 concerned the sign off of software forms by a person not designated by the Change Control Board (CCB) Chair.

2.0 SCOPE

The audit evaluated compliance to and the effectiveness of the Los Alamos QA program as described in the QA Program Plan, Revision 5, and the implementing quality and technical procedures.

The QA program elements/requirements evaluated during the audit are in accordance with the published audit schedule and are as follows:

QA PROGRAM ELEMENTS

3.0 Design Control
4.0 Procurement Document Control
7.0 Control of Purchased Items and Services
8.0 Identification and Control of Materials, Parts, and Components
19.0 Computer Software
20.0 Scientific Investigations

The following programmatic elements were not reviewed during this audit, since Los Alamos has performed no activities for which these elements apply:

10.0 Inspection
11.0 Test Control
15.0 Control of Nonconforming Items

TECHNICAL AREAS

WBS Number	Title
1.2.3.2.1.1.1	Mineralogy, Petrology, and Rock Chemistry of Transport Pathways
1.2.3.2.1.1.2	Mineralogical and Geochemical Alteration
1.2.3.3.1.2.2	Water - Movement Tracer Tests
1.2.3.3.1.3.1	Site Saturated Zone Ground Water Flow System

3.0 AUDIT TEAM AND OBSERVERS

The following is a list of audit team members, their assigned area of responsibility, and observers:

Individual	QA Program Element or Technical Area
Frank J. Kratzinger, Audit Team Leader, YMQAD	
Amelia I. Arceo, Auditior, YMQAD	4 and 7
John R. Matras, Auditor, YMQAD	19
John E. Therien, Auditor, YMQAD	8
Thomas E. Vandel, Auditor, YMQAD	3 and 20
Richard L. Weeks, Lead Technical Specialist, YMQAD	3 and 20
Neil D. Cox, Technical Specialist, YMQAD	WBS 1.2.3.3.1.2.2 WBS 1.2.3.3.1.3.1
Nile O. Jones, Technical Specialist, M&O	WBS 1.2.3.2.1.1.1 WBS 1.2.3.2.1.1.2
Robert Brient, Observer, NRC/SWRI	
Pauline Brooks, Observer, NRC	
John Spraul, Observer, NRC	
Susan Zimmerman, Observer, State of Nevada	
Donald G. Horton, Observer, Director, DOE	

YMQAD - Yucca Mountain Quality Assurance Division
M&O - Management and Operations Contractor
NRC - Nuclear Regulatory Commission
SWRI - Southwest Research Institute
DOE - Department of Energy

4.0 AUDIT MEETINGS AND PERSONNEL CONTACTED

The preaudit meeting was held at Los Alamos offices in Los Alamos, New Mexico, on November 2, 1992, and at Las Vegas, Nevada, on November 6, 1992. A daily debriefing and coordination meeting was held with Los Alamos management and staff, and daily audit team/observer meetings were held to discuss issues and potential deficiencies. The audit was concluded with a postaudit meeting held at Los Alamos offices in Los Alamos, New Mexico, on November 5, 1992, and at Las Vegas, Nevada, on November 6, 1992. Personnel contacted during the audit are listed in Attachment 1 to this report. The list includes an indication of those who attended the preaudit and postaudit meetings.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Effectiveness

The audit team concluded that, in general, the Quality Assurance Program for Los Alamos was being fully implemented and for this reason was determined to be satisfactory except for the following.

There was insufficient activity to make a determination of the effectiveness of the following QA program elements: 3.0 "Design Control", 4.0 "Procurement Document Control", and 7.0 "Control of Purchased Items and Services".

There was no activity for the following QA program elements: 10.0 "Inspection", 11.0 "Test Control", and 15.0 "Control of Nonconforming Items".

5.2 Stop Work or Immediate Corrective Actions or Additional Actions

None.

5.3 QA Program Audit Activities

Details of the QA program audit activities are provided in Attachment 2. A list of objective evidence reviewed during the audit is provided in Attachment 3.

5.4 Technical Activities

Details of the technical areas examined during the audit are provided in Attachment 2.

5.5 Summary of Deficiencies

The audit team identified three deficiencies during the audit. One deficiency was corrected prior to the postaudit meeting.

A synopsis of the deficiencies documented as CARs and the one corrected during the audit are detailed below. Information copies of the CARs are included in Attachment 4.

5.5.1 Corrective Action Requests (CARs)

As a result of the audit, the following CARs were issued:

CAR YM-93-018

Contrary to the requirements of procedure QP-03.17, the steps in the procedure were not followed when SCM audit issues were identified.

CAR YM-93-019

Contrary to the requirements of procedure QP-03.20, software forms were signed off by someone not designated by the CCB Chair as Change Control Authority.

5.5.2 Deficiency Corrected During the Audit

A deficiency which is considered isolated in nature and only requiring remedial action can be corrected during the audit. The following deficiency was identified and corrected during the audit.

Los Alamos procedure TWS-QAS-QP-03.5, Revision 0, Section 6.1, requires that the following information be recorded on the inside of the front of each notebook and logbook:

- o unique identification number,
- o assignee's name, or
- o instrument(s) or activity covered by the book, and
- o starting date for the book's use.

Contrary to this requirement, logbook TWS-EES-1-9-90-16 did not include the instrument(s) or activity covered by the book nor the starting date of the book's use.

This missing information was added to the inside front of the logbook correcting the condition prior to the postaudit meeting.

5.5.3 Follow-up of Previously Identified CARs

CARs YM-91-041 and YM-92-058 were discussed with Los Alamos personnel and were determined to be on schedule but not yet ready for verification of completed corrective actions.

6.0 RECOMMENDATIONS

The following recommendations resulted from the audit and are presented for consideration by Los Alamos management.

6.1 It is recommended when revising procedure QP-03.5, that the one review by QA prior to submitting the document to the LRC, be altered to be more compatible with the technical review so that any concerns can be more easily addressed without major impact. (See section 6.6 and 6.7 of the draft Revision 1 to procedure QP-03.5)

6.2 For software QA, it appears that there are too many forms required to complete the work of procedure QP-03.19, Table 1, "Characteristics for Documentation Forms". Specifically the Software Change Request(SCR), Software Incident Report(SIR), and Engineering Change Directive (ECD) could be combined on one form. In addition, the Software/Data Review Notice (SRN), Review/Audit Report and Recommendations (RRR), and Review/Audit Item Disposition (RID) could be combined on one form.

6.3 To eliminate duplicate reviews, the Software CCB should be totally removed from the "In Process" and "Final Review" processes other than for the assignment of the review person or team.

6.4 The use of desktop procedures for software would aid in assuring that all the requirements for someone like the Configuration Management (CM) Specialist are implemented so anyone properly trained could come in and perform the duties, including working with the CM database.

7.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit
Attachment 2: Audit Details
Attachment 3: List of Objective Evidence Reviewed During the Audit
Attachment 4: Information Copies of CARs

ATTACHMENT 1

Personnel Contacted During the Audit

Name	Organization/Title	Preaudit Meeting	Contacted During Audit	Postaudit Meeting
Bolivar, Stephen L.	LANL/QAPL	X	X	X
Broxton, David E.	LANL/TC	X	X	
Bumingham, Andrew G.	LANL/QAL	X	X	X
Canepa, Julie A.	LANL/TPO	X	X	
Chavez, Prestinia L.	LATA/ Training	X	X	X
Clark, David L.	LANL/Assoc. Inv.		X	
Clevenger, Michael J.	LANL/QAL	X	X	X
Dash, Zora V.	LANL/SCM		X	
Day, John L.	LATA/QA	X	X	
Elkins, Ned Z.	LANL/Deputy TPO			X
Essington, Edward H.	LANL/Assoc. Inv.	X	X	X
Fabryka-Martin, June T.	LANL/PI	X	X	X
Gainer, Gabriela M.	LATA/QAE	X	X	X
Gillespie, Paul F.	LATA/QAE	X		X
Levy, Schon S.	LANL/PI	X	X	X
Linzeg, Darlene F.	LANL/Chem. Tech.			X
Lopez, Loretta L.	LANL/Tech. Coor.	X	X	
Martinez, Sandra J.	LATA/RPC Oper.		X	X
Mitchell, Alan J.	LANL/Research			X
Noel, Susan	LATA/Records Ass't		X	
Polzer, Wilfred L.	LANL/Assoc. Inv.	X	X	X
Pratt, Allyn	LANL/Proj. Leader	X		
Robinson, Bruce A.	LANL/PI	X	X	X
Robinson, Marian	LATA/SCLC		X	X

Romero, Betty M.	LATA/Doc. Control	X			X
Shay, Richard S.	LATA/QAL	X		X	X
Springer, Everett P.	LANL/Proj. Leader	X			
Thompson, Alice L.	LANL/RFC				X
Valentine, Greg	LANL/PI			X	
Vaniman, David T.	LANL/PI	X		X	
Wightman, Scott J.	HGC/Analytical Ch.			X	
Williams, Donna L.	LATA/QAL	X		X	X

LANL Los Alamos National Laboratory
LATA Los Alamos Technical Associates
HGC Hydro Geo Chem
QAPL Quality Assurance Project Leader
QAL Quality Assurance Liaison
QAE Quality Assurance Engineer
TPO Technical Project Officer
SCM Software Configuration Management
PI Principal Investigator
SCLC Software Configuration Library Specialist

ATTACHMENT 2

Audit Details

The following is a summary of the QA program and technical activities covered during the audit. A list of objective evidence reviewed, by document identification and title, is given in Attachment 3.

3.0 DESIGN CONTROL

Objective evidence generated as a result of implementation of the following procedures was evaluated to determine compliance to specific requirements which are listed below:

QP-03.24, "Submittal of Design and Test-Related Information"(D&TRI)
QP-03.25, "Review of Design and Test-Related Information"

- The following QA records were generated as a result of implementation of this procedure:
  - draft D&TRI reviewed under this procedure;
  - review sheets;
  - memorandum identifying the scope, purpose and criteria of the review;
  - submittal memorandum signed by the LR and QAPL;
  - verified D&TRI submitted to the TOC.
- The signature of the QAPL and LR appear on the submittal memorandum.
- The LR has been designated in writing by the TPO.
- D&TRI not required to have a review, generated the following QA records:
  - D&TRI request memorandum (if applicable);
  - verified D&TRI;
  - acceptance/rejection memorandum.
- D&TRI requiring a review, generated the following QA records:
  - records identified above;
  - memorandum identifying the scope, purpose and criteria of the review;
  - review sheets;
  - revised D&TRI incorporating comments from the review;
  - documentation indicating the originating organization's approval of changes to the D&TRI (if applicable).

- The Review Qualification form and memorandum identifying LRs for testing were generated when required.

- Format and content requirements for D&TRI were developed.

- The criteria to develop D&TRI was included in a memorandum.

- A QA reviewer was included in the review process.

- Reviewers reviewed to the stated criteria.

There has been insufficient implementation of procedure QP-03.24 at this time, therefore, the effectiveness is indeterminate.

A review of the objective evidence for procedure QP-03.25, indicated that this procedure is being effectively and satisfactorily implemented.

Based on the examination of the above requirements, insufficient implementation of QA Program Element 3 has occurred in order to determine compliance.

4.0 PROCUREMENT DOCUMENT CONTROL
7.0 CONTROL OF PURCHASED ITEMS AND SERVICES

The evaluation of these program elements was based on the examination of objective evidence to determine compliance with selected requirements taken from implementing procedures QP-04.4, and QP-04.5. The selected requirements are listed below:

- Purchase requisitions (PRs) were used to initiate commercial-grade and noncommercial-grade procurement.

- Requestors of commercial-grade items and services completed the PR and supporting documentation and indicated on the PR the description of the item(s) or service, catalog number, when available, and the name of the recommended supplier.

- Requestors of commercial-grade services prepared Sample Acceptance Plans to specify the means of accepting the service.

- PRs for noncommercial-grade services included the scope of work description, technical requirements for work, QA program requirements, rights of access provision, subcontracting requirements, documentation requirements, deficiency reporting requirements, and performance requirements.

- One noncommercial-grade service supplier was selected as a supplier because another YMP participant had accepted the supplier. A letter of justification documented the prior acceptance.

- One noncommercial-grade service supplier elected to use the Los Alamos YMP QA program. Los Alamos audited the supplier prior to the award of contract.

- Quality Assurance Liaison (QAL) reviewed the procurement document to ensure that QA requirements had been met, marked "commercial-grade" or "non-commercial-grade" and "YMP", and signed/dated the PR.

- Receipt inspections were performed by the requestors and documented on the Receiving Inspection Report (RIR) forms.

- The RIR for commercial-grade items included the following checklists items: No physical damage that affects the function of the item(s), correct part numbers, correct serial numbers, operator's manual provided, special conditions complied with, all parts or components identified on packing slip and PR present, correct and complete documentation, and item(s) received in acceptable working order. The RIRs for the completed procurement packages were found satisfactory.

- Receipt inspection for commercial-grade services evaluated the services against the acceptance criteria stated in the Sample Acceptance Plan.

- Receipt inspection for non commercial-grade service was based on the acceptance criteria in the PR and all documentation specified in the PR was present and acceptable.

- Completed procurement record packages, which include; PRs, Sample Acceptance Plans for commercial-grade services, RIRs and other related documentation, were submitted by the QALs to the Record Processing Center (RPC).

- In-process procurements were filed in the group resident file.

- Personnel involved as requestors, reviewers, and receipt inspectors for commercial-grade procurement were trained to the requirements of QP-04.4.

- There was one completed procurement for noncommercial-grade service, PR-Z1801, which was completed on March 9, 1992. In addition, there was one in-process procurement for noncommercial-grade service, PR-N3993, dated August 2, 1990.

The procurement program for commercial-grade items and services (QP-04.4) appears to be satisfactorily implemented.

Because of insufficient implementation of QP-04.5, implementation of noncommercial-grade procurement is considered to be indeterminate.

Based on the examination of the above requirements, insufficient implementation of QA Program Elements 4 and 7 have occurred in order to determine compliance.

8.0 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

This program element was evaluated based on objective evidence to determine compliance with implementing procedures QP-08.1, and QP-08.3. The selected requirements are as listed below:

- The collection of the sample and the original field location is documented in a LANL YMP Notebook or other appropriate document (e.g., Sample Management Facility (SMF) Sample Collection Form).
- Investigators use SMF barcode labels or if they use their own identifiers, they maintain traceability to the SMF number through a LANL YMP log or notebook.
- LANL investigators who examine and/or secure samples from the SMF are trained to AP-6.3Q and AP-6.4Q.
- Investigators label a sample by placing a unique identifier on the sample or its container.
- Investigators store samples at LANL or at a LANL subcontractor facility, and that they have a LANL procedure for sample curation.
- Samples are stored under physical conditions that are appropriate for the samples intended purpose and expected maximum store life.
- When a sample deteriorates or is consumed, the investigator records that information in a YMP notebook or log.
- Investigators identify container requirements, methods of handling, environmental or safety considerations, or other items of concern in a procedure, notebook, or log when handling and shipping samples.
- The technical data coordinator prepares the transfer of data.
- The technical data coordinator prepares and submits data to the Reference Information Base (RIB).

Samples associated with three technical studies were evaluated to determine compliance with QP-08.1. Those areas were Mineralogy, Petrology, and Chemistry of Transport Pathways; Geochemical Alteration; and Water Movement Tracer Tests. Additionally, data processes related to "Volcanism Studies for the YMP Geology of Late Pleistocene and Quarternary Basaltic Volcanic Centers" was evaluated for proper entry into the RIB as delineated by QP-08.3. There were no entries of data into the Technical Data Base (TDB); however, the preparation of data up to that point was appraised.

Based on the examination of the above requirements, QA Program Element 8.0 is considered to be satisfactorily implemented.

19.0 COMPUTER SOFTWARE

The evaluation of this program element was accomplished through interviews with the Software Developers, Configuration Control Board (CCB) Chairperson, Software Configuration Manager and the Software Configuration Specialist. The goal of the interviews was to identify compliance and understanding of the "Software Quality Assurance Plan (SQAP)" and implementing procedures QP-03.17, QP-03.18, QP-03.19, QP-03.20, QP-03.21, and QP-03.22.

Selected requirements taken from the above implementing procedures are listed below:

- A Configuration Status Accounting Database shall identify configuration baselines and changes to such baselines and track these baselines throughout the life cycle.
- The life cycle controls for the development, modification or acquisition of software shall be documented on the Life Cycle Specification (LCS) form.
- The development, modification. or acquisition of software shall be initiated with a Software Change Request or a Software Incident Report. An Engineering Change Request shall be approved by the Chair of the CCB before life cycle controls are assigned.
- The documents and code specified on the LCS shall have completed a baseline-closure review before being approved.
- The TPO is the chair of the CCB.
- The CCB meeting shall be preceded by a meeting announcement and assignment of CCB members. The meeting shall be conducted and minutes documented in a prescibed format.
- Completed baselines shall be reviewed, certified and sanctioned before being used in licensing activity.
- Software requirements shall be traceable through all the baselines of a software product.
- The Software Requirements Specification, Software Design Document, Pseudocode, Models and Methods, Test Plan and Report, Code Prolog, User Manual, and Validation and Verification (V&V) Report shall be developed in prescribed formats.
- Software reviews shall be initiated with a Software/Data Notice. Software reviews shall be documented with a Review/Audit Report. Comment resolution activities shall be documented on a Review/Audit Item Disposition Form.

114 software packages have completed formal software verification and validation and can be used in licensing activities. Seven software packages were selected for audit after a review of Los Alamos status reports and internal letters and memoranda:

Of these software packages evaluated, QUANT and CDFTOOLS have been verified and validated for use.

Nineteen different forms are utilized to implement the Los Alamos SQA program (see Table 1 of TWS-QAS-QP-03.19, Revision 0). Fifteen forms were selected for evaluation. The forms were easily traceable from one life cycle step to the next and were correctly filled out.

Two conditions adverse to quality were identified during the audit. In the first condition, proper authorization was not obtained for the person signing the Change Control Authority signature block on the Review/Audit Report and Recommendations (RRR) and Review/Audit Item Disposition forms. This deficiency was documented on CAR YM-93-019.

The second condition dealt with the performance of the Software Configuration Management functional and physical audits. The procedure presently reads that if any audit issues are identified, the "Disposition" section of the Baseline Submission Summary should be checked "Not Accepted" and the baseline should be returned to the submitter for resolution. Contrary to this requirement, the Baseline Submission Summary was checked "Accepted" and the Configuration Management Specialist worked with the submitter to resolve identified audit issues. This deficiency was documented on CAR YM-93-018.

Although two CARs were generated as a result of this audit, QA Program Element 19.0 is considered to be satisfactorily implemented.

20.0 SCIENTIFIC INVESTIGATIONS

Objective evidence generated as a result of implementation of QP-03.5 and QP-03.23 was evaluated to determine compliance to specific requirements which are listed below:

- Required information is recorded inside the front of each notebook and logbook.
- The experimenter records in the field notebook daily or as appropriate the activity title and objective, field location, other relevant information, and signs and dates entries.
- For logbooks, the experimenter enters the appropriate information for the instrument or activity and signs or initials and dates the entry.
- Initial entries into laboratory notebooks include activity title, name of Principle Investigator and signature and date of the individual making entry.
- Laboratory notebooks used for research and development document the following as appropriate:

- objective(s) of activity;
- description of proposed approach reference to planning document that describes the approach;
- potential sources of error or uncertainty that would be measured or controlled;
- equipment and materials to be used;
- sample ID;
- calibration requirements;
- any required characterization of starting materials;
- required levels of precision and accuracy;
- controlled environmental conditions.

- Experimenter documents acceptance or rejection of data that results from deviation from normal performance or procedure or equipment malfunction or failure.

- Rejected data is appropriately identified.

- Laboratory notebooks used for research and development, document the following information for in-process entries:

  - title for each activity recorded in notebook;
  - provisions for ensuring experimental prerequisites are met;
  - sample ID if different from initial entry;
  - description of process followed, including references to descriptions in notebooks, manuals and texts;
  - ID of measuring and test equipment;
  - ID of any additional equipment;
  - special measures taken in handling, shipping, and storing equipment;
  - cleaning and set-up procedures for equipment;
  - calibrations performed;
  - all data or references to data files;
  - any conditions that may adversely affect results;
  - brief description of results;
  - notation of unacceptable results;
  - any deviations from the planned experiment;
  - interim conclusions.

- The experimenter signs and dates entries on day entries are made.

- Notebooks are independently reviewed when activity is completed or terminated.

- For non LANL-YMP qualified reviewers, a Reviewer Qualification form has been completed.

- Reviewers record a statement in the notebook or logbook indicating an understanding of the material and sign and date the final entry.

- Logbooks receive a QA review.

- The following records, for Technical Information Products (TIPs), were submitted to the Records Processing Center:

  - completed Publication Traveler;
  - completed review checklists and any reviewer comments;
  - review sheet;
  - draft that was technically reviewed;
  - draft that the TPO initially sends to the Project Office;
  - final approved version;
  - final published version;
  - Project Office approval;
  - additional review criteria, if used.

- Record packages for study plans contain the following records:

  - completed Publication Traveler;
  - completed review checklists and any attached comments;
  - review sheets;
  - draft that was technically reviewed;
  - study plan.

- TIPs contain the prescibed content as described in Attachment 3.

- TIPs follow the format as prescribed in Attachment 4.

- Resolution of mandatory comments is indicated by reviewers signature on the review sheet.

- The Publication Traveler was complete and contained all required signatures.

- Technical review criteria were attached to the TIP or study plan review sheet.

Overall, implementation of the Los Alamos QA procedures for QA Program Element 20.0 were considered to be satisfactory.

TECHNICAL ACTIVITIES

WBS 1.2.3.2.1.1.1; Study Plan 8.3.1.3.2.1

"Study Plan for Mineralogy, Petrology, and Chemistry of Transport Pathways", selected supporting procedures, notebooks, technical reference material, and data products were examined during the audit. The scientific and technical support personnel demonstrated a thorough knowledge of the subjects related to the execution of this study plan and also their compliance to conducting work in accordance with technical procedures.

Several tasks outlined in the study plan have been completed. For example, Section 3.2.4 addressed the problem of reproducing a petrographer's evaluation of a thin section. Results can be found in Moore, L.M.,et al.,1989, "Statistical Test of Reproducibility and Operator Variance in Thin-Section Modal Analysis of Textures and Phenocrysts in the Topopah Spring Member, Drill Hole USW VH-2, Crater Flat, Nye County, Nevada" (LA-11452-MS).

The process of using external and internal standards for quantitative mineralogy determinations by x-ray powder diffraction methods was examined in some detail. The mineral standards were selected to match the suite found at Yucca Mountain, Nevada. Data collection procedures were adequate as were those for data reduction. An excellent record of performance criteria was found in the researcher's notebooks. Supporting quality-affecting software was controlled and evaluated in Program Element 19.0.

The use of supporting software to model the results was also examined during this phase of the audit. No quality-affecting modeling software is currently being used since there is not enough data to make it worthwhile.

Minor deviations from the study plan were observed and justified. For example, section 2.4 of this study plan discusses the location of future drill holes needed to support the investigations described herein. At the time the study plan was written, the emphasis for sample collection was focused on surface-based testing, with only a modest underground test facility accessed by a shaft. Subsequent Project Office plans have significantly changed the approach to underground testing, stressing the need to collect information first hand from the underground facilities. As a result, the sample acquisition process has shifted away from the need for drill core.

WBS 1.2.3.2.1.1.2; Study Plan 8.3.1.3.2.2

"Study Plan for History of Mineralogic and Geochemical Alteration of Yucca Mountain", selected supporting procedures, notebooks, technical reference material, and data products were examined during the audit. The scientific and technical support personnel demonstrated a thorough knowledge of the subjects related to the execution of this study plan and also their compliance to conducting work in accordance with related technical procedures.

Sample transfer process plus data and informational interfaces between Los Alamos and USGS were reviewed. Sufficient controls over these processes assure maintenance of technical quality.

Work under this study plan provides wide latitude for interpreting results. The researchers demonstrated appreciation for this latitude by discussing the wide range of options open to them. Furthermore, they were able to define which data supported the various options, point out where data was lacking for a specific option, and where further data might open new avenues for interpretation.

Software supporting activities conducted under this study plan were found to be certified and under proper control in accordance with the Los Alamos SQAP.

WBS 1.2.3.3.1.2.2; Study Plan 8.3.1.2.2.2

The audit of this activity was conducted in the Los Alamos Technical Associates facilities by having records brought in from a security area. The activity involves the services of four subcontractors:

- Hydro Geo Chem (HGC), Tucson, Arizona, for solution preparations.
- University of Rochester (UR) for chemical analysis of solutions.
- Lawrence Livermore National Laboratory (LLNL) for chemical analysis of solutions.
- University of Arizona for research and development on stable isotopes.

Quality Assurance controls for HGC have been established by Los Alamos purchase request number 3993, dated 8/6/90. The Principal Investigator (PI) reviewed the work performed and formally accepted the work in a letter dated 2/10/92, contained in a laboratory notebook. Follow-on work is scheduled to be audited by Los Alamos in November, 1992.

The quality of the chemical analysis work by UR and LLNL is controlled by a protocol using blank samples, reference samples, and replicate samples. The PI will review results and determine if the work is acceptable.

HGC receives rock samples from the Sample Management Facility as directed by the PI for this activity. There are no applicable special handling requirements for rock samples. There are no applicable special handling requirements for shipments of solutions from HCG to UR and LLNL.

The PI has satisfactorily prepared a criteria letter (TWS-INC-07-92-12) for sample collection during the UZ-14 task on the Nevada Test Site (NTS). This letter underwent independent technical review by Los Alamos personnel, and all comments were resolved.

Three laboratory notebooks (1 Los Alamos and 2 HGC), a field notebook, and three sample inventory logbooks (1 HGC and 2 Los Alamos) were reviewed. All were legible and satisfactorily allowed one to understand the work performed. Detailed procedures were being followed as required.

Two sets of anomalous results have been found. One is that the chloride concentration in Midway soil samples are larger than those from cutting samples. The second anomalous result is that unexpectedly high values of the chlorine isotope ratio were found in bedded tuff underlying the Tiva Canyon welded unit in well number USW UZ-N55. Both of these conditions are being or will be addressed, the former by data checks and the latter by additional tests to assess the reproducibility of the elevated signals.

WBS 1.2.3.3.1.3.1; Study Plan 8.3.1.2.3.1.7

The audit of this activity was conducted in Los Alamos building 5126. The work to date has involved laboratory tests involving batch adsorption/desorption of lithium ions on rock samples. The series of tests conducted at a controlled temperature of 38 °C is nearing completion. The series of tests conducted at 25 °C is about half completed. There has been no analysis of the data so far.

Leaching in column experiments may be started in FY 1993 if funding is sufficient. No estimate of the starting time for field tests could be made.

The computer software items FEHMN and FRACNET are expected to be useful for designing the field tests. These software items are in the Software Quality Assurance Program and are ready to begin the process of being verified and validated.

The technical areas reviewed appear to be satisfactorily and effectively implemented.

ATTACHMENT 3

List of Objective Evidence Reviewed During the Audit

QA Program Element 3.0, "Design Control"

Procedures:

LANL-YMP-QP-03.24, Revision 0, Submittal of Design and Test-Related Information
LANL-YMP-QP-03.25, Revision 0, Review of Design and Test-Related Information

Records Package:

TWS-EES-13-LV-08-92-35 - Fran Ridge Pit Mapping

QA Program Element 4.0, "Procurement Document Control"
QA Program Element 7.0, "Control of Purchased Items and Services"

Procedures:

LANL-YMP-QP-04.4, Revision 1, Procurement of Commercial-Grade Items and Services
LANL-YMP-QP-04.5, Revision 2, Procurement of Noncommercial-Grade Items and Services

Purchase Requisitions (PRs):

PRs transmitted on Records Package Traveler TWS-INC-05-92-07 dated 5/20/92:

PR No.	PR Date	QA Approved Date	Item Description
W0169	11/25/91	11/27/91	PSSHOW Graphics Software for SGI IRIS-4D
X0688	06/19/91	06/19/91	tensiconder, septum, needles, vacuum chamber
X2732	07/05/91	07/10/91	MAC 241 (DEC VT-125 emulator)
X6127	10/04/91	10/04/91	olefin sample bags, polybond bags, munsell C
X7182	08/13/91	08/16/91	ultra alpha detector, ultra A detect, nimbin
X7396	12/12/91	12/16/91	minerals, water samples cation, anion analysis*
Y2100	01/07/92	01/09/92	mineral & water samples for cation & anion*
Y2105	01/07/92	01/07/92	10 g, sodium carbonate; deuterium oxide
Y2140	01/23/92	01/23/92	gadolinium chloride; erbium chloride
Y2145	01/28/92	01/30/92	absolute vacuum gage
Y2204	02/11/92	01/11/92	peek tubing; 1/8" ferrule; peek 1/8" bushing
Y2342	04/13/92	04/17/92	500 ml peek loop; 1 ml peek loop

Z3406	03/27/92	03/30/92	color monitor; display card, label printer
Z3407	03/27/92	03/30/92	sanidine, albite, anorthoclase
Z3430	03/03/92	03/03/92	olefin, sample bags, 7" x 12.2
Z3442	03/18/92	03/23/92	sieve, soil pan, soil cover
Z3455	10/30/91	10/30/91	adapter, lens, support stand, support rod
37005SM	11/19/91	11/21/91	advanced gradient pump (431116)

PRs transmitted on Records Package Traveler TWS-INC-07-92-05 dated 7/9/92:

PR No.	PR Date	RIR Date	Item Description
Q4681	08/09/90	05/07/92	Nannoscope II system
6860E	04/24/92	07/08/92	Tektronix phaser II PXI color printer
6861E	04/27/92	07/09/92	Model 171101 Power-conditioner

PRs transmitted on Records Package Traveler TWS-INC-7-02-92-01 dated 2/11/92:

PR No.	PR Date	RIR Date	Item Description
X6013	07/03/91	12/18/91	Specialty Gas 30 mole % nitrogen, 70 mole % helium
X6063	08/19/91	12/18/91	sample cell macro cells
X7371	11/27/91	01/06/92	peek rod 100 x 600 mm
Y2069	10/02/91	11/14/91	polyethylene sheet 10 m pore size
Y2074	10/02/91	11/20/91	tefzel tube connector, fittings loops

PR transmitted on 10/21/91, TWS-EES-13-10-91-058
U5598, PR dated 5/7/91, RIR dated 10/15/91, computer software, Microsoft Quick/Drawperfect.

PR transmitted on 3/2/92, TWS-EES-13-03-92-030
Z1801, PR dated 9/6/91, NIST, Calibration of 1mg - 5kg weight set, catalog #22020C and 22030C**

In-Process PRs:
08138E, PR dated 8/9/92, Quanta Chrome, BETA Surface Analysis*
Z8437, PR dated 12/16/91, University of Washington, St. Louis, MO, Analysis of Geological Samples*
N3993, PR dated 8/2/90, HydroGeoChem, Support for Water Movement Test**

* Commercial grade services PRs
** Noncommercial-grade services PRs

Training to the requirements of QP-04.4, Revision 1, and QP-04.5, Revision 2, of the following personnel was verified:

Michael Clevenger
June F. Martin

Training to the requirements of QP-04.4, Revision 1, of the following personnel was verified:

Arend Meijer	Alan Mitchell
Martin Ott	Inez Triay
Pamela Rogers	Terry Morgan
Donna Williams	

Miscellaneous:
Record Package Traveler TWS-INC-11-92-01, dated 11/04/92, Correction Package to TWS-INC-05-92-07
Audit Report No. LANL-AR-14, dated 12/5/91, HydroGeoChem
Audit Report No. LANL-AR-90-011, dated 5/17/91, HydroGeoChem
Draft Report "Molecular Models for Actinide Speciation" by David L. Clark, et al.
Letter of Justification dated 11/22/91, Acceptance of Results of Procured Services Report dated 3/9/92, Shipping Requirements, Calibration Certificate Requirement and Acceptance Criteria for PR-Z1801, NIST

QA Program Element 8.0, "Identification and Control of Materials, Parts, and Components"

Procedures:

LANL-YMP-QP-08.1, Revision 2, Identification and Control of Samples
LANL-YMP-QP-08.3, Revision 0, Transfer of Data
DP-87, Revision 2, Identification, Storage, and Handling of Samples at HydroGeoChem
DP-88, Revision 0, Collection of Soil Samples for Analysis of Moisture Content, Bulk Density, Halides and Chlorine Isotopes
DP-89, Revision 0, Procedure for Sieving Soil and Rock Samples
DP-90, Revision 1, Measurement of Moisture Content of Soil Samples
DP-92, Revision 0, Sample Leaching to Extract Soluble Chloride and Bromide
DP-101, Revision 1, Documenting and Collecting Samples
DP-301, Revision 1, Field Collection of Experimental Materials
DP-307, Revision 1, Sample Identification and Control

Geologic Samples:

Rocks: LANL Numbers 433, 434, 435, 436, 437, 438, 449, 450, 451

Ream-bit Cuttings: LANL Numbers R081, R082, R083, R093, R094, R095

Soil Samples: LANL Numbers SM029, SM028, SM030

Crushed Bullfrog Tuff: LANL Number C2
SMF Numbers 016536, 016537, 016538

Scientific Notebooks:

TWS-EES-1-5-92-6
TWS-EES-1-5-86-18
TWS-EES-1-11-82-3
TWS-INC-7-10-91-04
TWS-HSE-12-1-88-11

Training to the requirements of AP-6.3Q and AP-6.4Q was verified for the following personnel:

D.E. Broxton	D.T. Vaniman
Schon Levy	June Fabryka-Martin

Data Packages:

Surface-Discharging Hydrothermal Systems at Yucca Mountain, TDIF dated 10/6/92, DTN #24.001

Revised Mineralogic Summary of Yucca Mountain, Nevada, TDIF dated 6/16/92, DTN # 18.001

Preliminary Assessment of Clinoptilolite K/AR Results from Yucca Mountain, Nevada, a Potential High-Level Radioactive Waste Repository Site, TDIF dated 9/22/92, DTN # 23.001

Volcanism Studies for the Yucca Mountain Project Geology of Late Pleistocene and Quarternary Basaltic Volcanic Centers, RIB-001, dated 7/14/92

QA Program Element 19.0, "Computer Software"

Plans:

LANL-YMP-SQAP, Revision 0, Software Quality Assurance Plan

Procedures:

TWS-QAS-QP-03.17, Revision 0, Reviews of Software and Computational Data
TWS-QAS-QP-03.18, Revision 0, Creation, Management, and Use of Computational Data
TWS-QAS-QP-03.19, Revision 0, Documentation of Software and Computational Data
TWS-QAS-QP-03.20, Revision 0, Software Configuration Management
TWS-QAS-QP-03.21, Revision 0, Software Life Cycle
TWS-QAS-QP-03.22, Revision 0, Verification and Validation of Software and Computational Data

CCB Meeting Minutes
CMM-35

CCB Meeting Announcement
CMA-36

CCB Participation Notice
CPN-96/97/98/99/100/101/102/103/104

Software Change Requests
SCR-00016 NETCDF
SCR-102 GZSOLVE
SCR-00022 FRACNET
SCR-00023 FEHMN
SCR-00021 SORBEQ

Engineering Change Directive
ECD-00012 NETCDF
ECD-97 GZSOLVE
ECD-00021 FRACNET
ECD-00022 FEHMN
ECD-00020 SORBEQ

Life Cycle Specification
LCS-20 SORBEQ
LCS-22 FEHMN
LCS-21 FRACNET
LCS-97 GZSOLVE
LCS-12 NETCDF

Engineering Change Notice
ECN-8 NETCDF

Baseline Certification Notice
BCN-9

I/O Handling Routines Development Folder
SCR-00025
ECD-24
LCS-24
BSS-13/45/122
RRR-15/80/94/150/240/239/220/206/200
SRN-13/118
RID-43/88/99/120/121/122/240/241/242/259/260/261/262/263/264/265/266/
267/271/272/273/274/276/44/45/46
RRR-63

BCN-25/97
ECN-110

SORBEQ Development Folder
BSS-12/39/98
RRR-13/71
SRN-12/36/100
RRR-41/88/148/211/199
RID-12/13/14/15/16/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/116/117/118/277/278/210/209/211
BCN-21/48
SORBEQ SRS ECD-00020
SORBEQ Detailed Design Baseline
RQS-1, Reviewer Qualification Summary
SORBEQ MMS ECD-00020
SORBEQ SDD ECD-00020
SORBEQ_FILE_LISTS.BUNDLE

FRACNET Development Folder
BSS-35/99
SRN-33/97
RRR-53/79/192/201
RID-56/57/243/244/250
BCN-37/84
FRACNET SRS ECD-00021
FRACNET SDD ECD-00021

FEHMN Development Folder
RRR-220/216
SRN-106
BSS-109
FEHMN SRS ECD-22
RSQ-1

QUANT Implementation Folder
BSS-106
RRR-215
RID-300
RID-301

QUANT Detailed Design Folder
BSS-93
RRR-181
RID-221

CDFTOOLS Implementation Folder

BSS-100
RRR-200
RID-240

QA Program Element 20.0, "Scientific Investigations"

Procedures:

TWS-QAS-QP-03.5, Revision 0 and ICNs 074 and 131, Procedure for Documenting Scientific Investigations
LANL-YMP-QP-03.23, Revision 0, Preparation and Review of Technical Information Products and Study Plans
TWS-ESS-DP-03, Revision 3, Petrology Procedure
LANL-ESS-DP-07, Revision 4, Cameca MBX Electron Microprobe Operating Procedure
LANL-EES-DP-16, Revision 5, Siemens X-Ray Diffraction Procedure
LANL-EES-DP-24, Revision 3, Calibration and Alignment of the Siemens Diffractometers
LANL-EES-DP-25, Revision 4, Clay Mineral Separation and Preparation for X-Ray Diffraction Analysis
TWS-INC-DP-62, Revision 2, Bulk NTS Well Water Samples
LANL-INC-DP-87, Revision 1, Identification, Storage, and Handling of Samples at Hydro Geo Chem
LANL-INC-DP-88, Revision 0, Collection of Soil Samples for Analysis of Moisture Content, Bulk Density, Halides and Chlorine Isotopes
LANL-INC-DP-89, Revision 0, Procedure for Sieving Soil and Rock Samples
LANL-INC-DP-90, Revision 1, Measurement of Moisture Content of Soil Samples
LANL-INC-DP-92, Revision 0, Sample Leaching to Extract Soluble Chloride and Bromide
LANL-INC-DP-97, Revision 0, Preparation of Carrier Solution for Chloride-36 Samples
TWS-ESS-DP-101, Revision 1, Sample Collection, Identification, and Control for Mineralogy-Petrology Studies
TWS-ESS-DP-102, Revision 2, Procedure for Determination of Volume Constituents in Thin Sections of Rocks
TWS-ESS-DP-103, Revision 1, Geopetal Orientation Measurement
LANL-ESS-DP-110, Revision 2, Zeolite Purification/Separation Procedure
LANL-ESS-DP-111, Revision 2, Procedure for X-Ray Fluorescence Analysis
LANL-ESS-DP-112, Revision 2, Operating Instructions for IDS DS-130 Scanning Electron Microscope and Tracor Northern Series II X-Ray Analyzer
TWS-ESS-DP-116, Revision 1, Quantitative X-Ray Diffraction Data Reduction Procedure
LANL-EES-DP-119, Revision 1, Moisture Evolution Analyzer Procedure
LANL-EES-DP-121, Revision 1, Long-Term Sample Heating Procedure
LANL-EES-DP-126, Revision 1, Heavy-Liquid Mineral Separation Procedure
LANL-EES-DP-130, Revision 0, Geologic Sample Preparation
TWS-HSE12-DP-312, Revision 1, Particle Size Reduction of Geologic Media
TWS-HSE12-DP-315, Revision 0, Calibration and Use of Temperature Measurement and Control Devices

LANL-EES15-DP-317, Revision 2, Calibration and Use of Analytical and Top Loading Balances
TWS-HSE12-DP-318, Revision 1, pH Measurement, Acid-Base Solution Standardization, and Total Alkalinity Determination
TWS-HSE12-DP-320, Revision 0, Measurement of Disolved Oxygen
TWS-HSE12-DP-322, Revision 0, Magnetic Separation of Solid Materials
TWS-HSE12-DP-323, Revision 0, Spectrophotometric Determination of Constituent Concentrations in Solution
LANL-EES15-DP-326, Revision 0, Ion-Chromatographic Determination of Constituent Concentrations in Solution

Study Plans:

8.3.1.2.2.2 (WBS No. 1.2.3.3.1.2.2) Water Movement Tracer Tests
8.3.1.2.3.1.7 (WBS No. 1.2.3.3.1.3.1) Site Saturated Zone Ground Water Flow System
8.3.1.3.2.1 (WBS No. 1.2.3.2.1.1.1) Mineralogy, Petrology, and Rock Chemistry of Transport Pathways
8.3.1.3.2.2 (WBS No. 1.2.3.2.1.1.2) History of Mineralogical and Geochemical Alteration of Yucca Mountain

Notebooks and Logbooks:

TWS-ESS-1-8/82-19	Scientific Notebook - S. Levy
TWS-ESS-1-7/86-35	Logbook for Brinkman Grinder
TWS-EES-1-8/86-57	International Standards/Weighing Logbook
TWS-EES-1-2/88-20	Scientific Notebook - D. Broxton
TWS-EES-1-3-89-17	XRD Sample Login Logbook
TWS-EES-1-9-89-27	Field Notebook - D. Broxton
TWS-EES-1-9-90-16	Logbook - Thin Sections
TWS-EES-1-1-90-1	Siemens X-Ray Diffraction Logbook
TWS-EES15-09-92-001	C Well Lab Studies #5
TWS-EES15-06-92-003	Filter Test Run Log
TWS-EES15-06-92-001	Ion C. Error Calibration Run Log
TWS-EES15-07-92-001	Equilibration of J13 & Bullfrog
TWS-INC-7-03-92-05	Field Notebook - Identification, Storage and Handling of Soil Samples (LANL)
TWS-INC-7-04-90-01	Laboratory Notebook (LANL)
TWS-INC-7-02-92-02	Laboratory Notebook (HGC)
TWS-INC-7-02-92-03	Laboratory Notebook (HGC)
TWS-INC-7-02-92-07	Field Notebook
TWS-INC-7-10-91-04	Sample Inventory Logbook (HGC)
TWS-INC-7-02-92-04	Sample Inventory Logbook (LANL)
EES-1 MS D462	Notebook
EES-1-1/86-24	Logbook - ISI Scanning Electron Microscope and X-Ray Analyzer
TWS-HSE12-1/88-11	Sample Logbook (LANL)

TWS-HSE12-8/88-13	Notebook - C-Well Laboratory Studies #4
TWS-EES-13-LV-08-92-14	USW-UZ Series Drilling Activities Design and Test Related Information (SCP 8.3.1.2.2.2.1)
PN 625021	Sample balance calibration record (Sortorius balance)
CS12.MTH	Ion-Chromatograph Run Log Dated 5/15/92 thru 6/19/92

TIPs and Study Plan:

TWS-EES-1-9-92-8	Chemical Change Associated with Zeolitization of Tuffaceous Beds of Calico Hills at Yucca Mountain, Nevada
TWS-EES-1-9-92-9	Fracture Lining Manganese Oxide Minerals in Silicic Tuff at Yucca Mountain, Nevada
TWS-EES-1-9-92-10	Preliminary Assessment of Clinoptilolite K-Ar Results from Yucca Mountain, Nevada
TWS-EES-13-08-92-1440	Dehydration and Rehydration of a Tuff Vitrophere
TWS-EES-13-09-92-1528	K/Ar Dating of Clinoptilolites: Methods and Preliminary Results
TWS-EES-13-07-92-1430	Manganese Accumulation in Rock Varnish in a Desert Piedmont, Mojave Desert, California, and Application to Evaluating Varnish Development
TWS-EES-13-08-92-1441	Mineralogy as a Factor in Radioactive Waste Transport through Altered Pyroclastic Rocks at Yucca Mountain, Nevada
TWS-EES-13-12-91-068	Natural Gels in the Yucca Mountain Area, Nevada, USA
TWS-EES-13-04-92-054	Paleogeothermal and Paleohydrologic Conditions in Silicic Tuff from Yucca Mountain, Nevada
TWS-EES-13-08-92-1438	Pedogenesis of Siliceous Calcretes at Yucca Mountain, Nevada
TWS-EES-13-02-92-026	Precipitation of Calcite, Dolomite, Sepiolite and Silica from Evaporated Carbonate and Tuffaceous Waters of Southern Nevada
8.3.1.8.1.2	Physical Process of Magmatism and Effects on Potential Repository

Los Alamos publications:

Bish, D.L., and Chipers, S.J., 1989, Revised Mineralogic Summary of Yucca Mountain, Nevada, Los Alamos National Laboratory Publication LA-11497-MS.

Bish, D.L., 1990, Thermal Stability of Zeolitic Tuff from Yucca Mountain, Nevada, Proceedings of the High Level Radioactive Waste Management Conference, Las Vegas, Nevada, Vol. 1, pp. 596-602.

Campbell, K., Broxton, D.E., and Spraw, J., 1989, Status of Image Analysis Methods to Delineate Stratigraphic Position in the Topopah Spring Member of the Paintbrush Tuff, Yucca Mountain, Nye County, Nevada, Los Alamos National Laboratory Publication LA-11694-MS.

Moore, L.M., Byers, Jr., F.M., and Broxton, D.E., 1989, Statistical Test of Reproducibility and Operator Variance in Thin-Section Modal Analysis of Textures and Phenocrysts in the Topopah Spring Member, Drill Hole USW VH-2, Crater Flat, Nye County, Nevada, Los Alamos National Laboratory Publication LA-11452-MS.

Instruments examined; all tagged "Operator to Calibrate":

Oxygen Meter, 636915
Dionex conductivity detector, PN/649497
Zetasizer3 (particle sieving), 649092
Spectronic 100
Mettler balance, 695205
Balance, 695207
Sartorius balance, 695206
Fisher titrater, 695208
Fisher titrater, 638381

Yucca Mountain Site Characterization Monthly Activity Reports:

June, 1992, Attachment to TWS-EES-13-07-92-051, page 11
July, 1992, Attachment to TWS-EES-13-08-92-043

Miscellaneous:

N 3993	Purchase Request - Hydro Geo Chem
LANL-AR-90-11	LANL/LATA Audit Report
TWS-INC-07-92-12	Criteria letter for sample collection at Well UZ-14
QUANT	Software program

ATTACHMENT 4

Information Copies of Corrective Action Requests

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

6 CAR NO.: YM-93-018
DATE: 11/6/92
SHEET: 1 OF 1
QA

CORRECTIVE ACTION REQUEST

1 Controlling Document	2 Related Report No.
YMS-QAS-QP-03.17, Revision 0	Audit YMP-93-02

3 Responsible Organization	4 Discussed With
LANL	B. Robinson/S. Bolivar

5 Requirement:

Section 6.2.2, "SCM Audits" states, "If audit issues are identified, perform the following actions and await resumption of the process at Step 6.2.1.

- In the "Disposition" section of the Baseline Submission Summary, check "Not Accepted," supply an explanation under "SCM/CCB Comments," and sign and date the form and return a copy to submitter.
- Return copies of all Review/Audit Item Disposition forms and the Review/Audit Report and Recommendations form to the submitter for resolution.
- Remove the proposed Baseline from the LANL YMP Certification Environment."

6 Adverse Condition:

In contrast to the above requirement when audit issued were identified

1. (1st Bullet) The "Disposition" section of the Baseline Submission Summary was not checked "Not Accepted."
2. (3rd Bullet) The proposed baseline was not removed from the LANL YMP Certification Environment.

9 Does a significant condition adverse to quality exist? Yes___ No X If Yes, Circle One: A B C	10 Does a stop work condition exist? Yes___ No X ; If Yes - Attach copy of SWO If Yes, Circle One: A B C D	11 Response Due Date: 20 Working Days from Issuance

12 Required Actions: ☒ Remedial ☐ Extent of Deficiency ☒ Preclude Recurrence ☐ Root Cause Determination

13 Recommended Actions:
Revise procedures to reflect current operating practices.

7 Initiator John R. Matras	Date 11/6/92	14 Issuance Approved by: QADD	Date 11/13/92
15 Response Accepted QAR	Date	16 Response Accepted QADD	Date
17 Amended Response Accepted QAR	Date	18 Amended Response Accepted QADD	Date
19 Corrective Actions Verified QAR	Date	20 Closure Approved by: QADD	Date

ATTACHMENT 4

Information Copies of Corrective Action Requests

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

8 CAR NO.: YM-93-019
DATE: 11/6/92
SHEET: 1 OF 1
QA

CORRECTIVE ACTION REQUEST

1 Controlling Document: TWS-QAS-QP-03.20, Revision 0	2 Related Report No.: Audit YMP-93-02
3 Responsible Organization: LANL	4 Discussed With: B. Robinson/S. Bolivar

5 Requirement:

Section 6.2.4.1, "Procedure for the CCB Chair"

Appoint a person or group to act as "Change Control Authority." Conduct a vote of the CCB to ratify these appointments.

6 Adverse Condition:

Contrary to the above requirement, personnel signed the following forms as Change Control Authority, but was not appointed by the CCB Chair and ratified by the CCB: RRR-200, RID-240, RID-241, and RID-242.

9 Does a significant condition adverse to quality exist?	10 Does a stop work condition exist?	11 Response Due Date:
Yes___ No X_	Yes___ No X_; If Yes - Attach copy of SWO	20 Working Days from Issuance
If Yes, Circle One: A B C	If Yes, Circle One: A B C D	

12 Required Actions: ☒ Remedial ☒ Extent of Deficiency ☒ Preclude Recurrence ☐ Root Cause Determination

13 Recommended Actions:
Obtain Change Control Authority for the CM Specialist to correct discrepancies found during Physical and Functional CM audits.

7 Initiator: John R. Matras Date 11/6/92	14 Issuance Approved by: QADD Date 11/13/92
15 Response Accepted: QAR Date	16 Response Accepted: QADD Date
17 Amended Response Accepted: QAR Date	18 Amended Response Accepted: QADD Date
19 Corrective Actions Verified: QAR Date	20 Closure Approved by: QADD Date