



Department of Energy

Washington, DC 20585

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QA

APR 24 1991

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Technical Project Officer  
for Yucca Mountain  
Site Characterization Project  
U.S. Geological Survey  
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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT (OCRWM) QUALITY ASSURANCE  
(QA) AUDIT YMP-91-05 OF THE U.S. GEOLOGICAL SURVEY (USGS) IN SUPPORT OF THE  
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

Please be advised that a team of auditors from OCRWM's Yucca Mountain  
Quality Assurance Division will conduct a QA audit of the USGS QA Program  
in Denver, Colorado, during the period of May 20-24, 1991. The audit will be  
conducted in accordance with the enclosed audit plan.

Observers from the State of Nevada, the U.S. Nuclear Regulatory Commission,  
or other interested parties may also accompany the audit team. It is  
anticipated that approximately 20 auditors/observers will be present at the  
audit.

You are requested to arrange for appropriate space to conduct meetings,  
provide cognizant personnel to support the audit, and provide access to  
necessary USGS documentation and records.

If you have any questions regarding this audit, please contact either  
James Blaylock at 794-7913, or Charles C. Warren at 794-7248.

OQA:JB-3405

Enclosure:  
Audit 91-05

*Waltura for DG HORTON*  
Donald G. Horton, Acting Director  
Office of Quality Assurance

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YUCCA MOUNTAIN PROJECT  
QUALITY ASSURANCE AUDIT PLAN  
FOR  
AUDIT YMP 91-05  
OF  
UNITED STATES GEOLOGICAL SURVEY  
DENVER, COLORADO  
MAY 20 THROUGH MAY 24, 1991

Prepared By: Charles C. Warren  
Charles C. Warren  
Audit Team Leader

Date 4-23-91

Approved By: Waltura for DG HORTON  
Donald G. Horton, Acting Director  
Office of Quality Assurance

Date 4/24/91

ENCLOSURE

## 1.0 SCOPE

This audit will evaluate the effectiveness of the United States Geological Survey (USGS) Quality Assurance (QA) program in meeting the requirements and commitments imposed by the Office of Civilian Radioactive Waste Management (OCRWM).

Specifically, the audit will evaluate the effectiveness of USGS QA Program requirements and implementing procedures. In addition, implementation of corrective action(s) as provided in the response(s) to open Project Office Standard Deficiency Reports will be evaluated and, if found satisfactory, will be closed.

Programmatic elements and technical activities to be audited are identified in Section 4.0 of this plan.

## 2.0 AUDIT SCHEDULE

Pre-audit Team/Observer Meeting	8:30 a.m., May 20, 1991
Pre-audit Conference	9:30 a.m., May 20, 1991
Audit Activities	10:00 a.m. - 4:00 p.m. May 20, 1991
	8:00 a.m. - 4:00 p.m. May 21-23, 1991
	8:00 a.m. - 11:30 a.m. May 24, 1991
Post-audit Conference	2:00 p.m., May 24, 1991

## 3.0 REQUIREMENTS TO BE AUDITED AND APPLICABLE REFERENCES

USGS Quality Assurance Program Plan-01, Revision 5

USGS Quality Management Procedures and applicable Yucca Mountain Project Administrative Procedures (Quality)

Applicable USGS Technical Implementing Procedures

The conduct of the audit will be accomplished in accordance with the DOE documents listed below:

OCRWM QAAP 18.2, Rev. 3, Audit Program

OCRWM QAAP 16.1, Rev. 3, Corrective Action Requests

Audit Observer Inquiry

Policy for Participation of State, Tribal, and NRC Representatives as Observers on DOE Audits, dated July 14, 1987

HLW Division Procedure for Conducting Observation Audits of DOE High Level Waste Repository Program QA Audits

#### 4.0 ACTIVITIES TO BE AUDITED

##### Programmatic Elements

- 1.0 Organization
- 2.0 Quality Assurance Program
- 3.0 Scientific Investigation 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 Nonconforming Items
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits

This audit will not address Programmatic Elements 9, 10, 11, and 14 since USGS has no activities to which these elements apply. However, in addition to the above listed elements, Computer Software QA will also be audited.

##### Technical Activities

SCP NUMBER	TITLE
8.3.1.2.2.7	Unsaturated Zone Hydrochemistry
Activity (.1)	Gaseous Phase Chemical Investigations
Activity (.2)	Aqueous Phase Chemical Investigations

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|---------------|--|
| 8.3.1.2.3.1   | Site Saturated Zone Ground-Water Flow System                 |
| Activity (.2) | Site Potentiometric-Level Evaluation                         |
| Activity (.3) | Analysis of Single- and Multiple-Well Hydraulic-Stress Tests |
| Activity (.4) | Multiple-Well Interfacing Testing                            |
| 8.3.1.5.2.1   | Quaternary Regional Hydrology                                |
| Activity (.3) | Evaluation of Past Discharge Areas                           |
| Activity (.4) | Analog-Recharge Studies                                      |
| Activity (.5) | Studies of Calcite and Opaline Silica Vein Deposits          |
| 8.3.1.17.4.1  | Historical and Current Seismicity                            |
| Activity (.1) | Compile Historical Earthquake Record                         |
| Activity (.2) | Monitor Current Seismicity                                   |
| Activity (.3) | Evaluate Potential for Induced Seismicity at the Site        |

The evaluation of the above activities by Technical Specialists will include a determination of adequacy in the following areas:

1. Technical qualifications of scientific personnel.
2. Understanding of procedural requirements as they pertain to scientific investigation activities.
3. Adequacy of technical procedures.
4. Development of study plans, work supporting the Site Characterization Plan, and any related work.

If the audit team identifies a need to evaluate additional programmatic or technical areas during the audit, these areas will be added to audit checklists or evaluated during follow-up surveillance(s), as appropriate.

## 5.0 AUDIT TEAM MEMBERS

James Blaylock, Audit Manager, U. S. Department of Energy (DOE), Las Vegas, Nevada

Charles Warren, Audit Team Leader, MAC Technical Services Company (MACTEC), Las Vegas, Nevada

A. Edward Cocoros, Auditor, MACTEC, Las Vegas, Nevada

Robert Constable, Auditor, DOE, Las Vegas, Nevada

Stephen Dana, Auditor, Science Applications International Corporation  
(SAIC), Las Vegas, Nevada

John Martin, Auditor, SAIC, Las Vegas, Nevada

Kenneth McFall, Auditor, SAIC, Las Vegas, Nevada

Terry Noland, Auditor, Westinghouse, Las Vegas, Nevada

Richard Weeks, Auditor, SAIC, Las Vegas, Nevada

Thomas Higgins, Lead Technical Specialist, SAIC, Las Vegas, Nevada

Paul Cloke, Technical Specialist, SAIC, Las Vegas, Nevada

Keith Kersch, Technical Specialist, SAIC, Las Vegas, Nevada

Forrest Peters, Technical Specialist, SAIC, Las Vegas, Nevada

#### 6.0 AUDIT CHECKLISTS

The following checklists will be used to perform this audit:

91-05-1 Programmatic Checklist

91-05-2 Technical Checklist

APR 24 1991

Larry R. Hayes

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cc w/encl:

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