OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION

QUALITY ASSURANCE SURVEILLANCE REPORT OF

SANDIA NATIONAL LABORATORIES

SURVEILLANCE YMP-SR-93-043

CONDUCTED AT THE YUCCA MOUNTAIN SITE AND LAS VEGAS OFFICES

AUGUST 30 THROUGH SEPTEMBER 03, 1993

ACTIVITIES SURVEILLED:

IMPLEMENTATION OF SCIENTIFIC NOTEBOOK METHODOLOGY DURING SANDIA NATIONAL LABORATORIES' PENETRATION RESISTANCE TESTING AND SOIL SAMPLING AT THE UE-25 NRG-2B BOREHOLE

Prepared by: John R. Doyle. Date: 9/16/93.

John R. Doyle
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Yucca Mountain Quality Assurance Divison

Approved by: R.C. Spence For Date: 9/15/93

Donald Horton
Director
Office of Quality Assurance

## 1.0 EXECUTIVE SUMMARY

This surveillance of Sandia National Laboratories (SNL) observed penetration testing and sampling in accordance with scientific notebook methodology, conducted at the UE-25 NRG-2B borehole in Area 25 of the Yucca Mountain Site on August 30, 1993. The remainder of the surveillance was conducted at SNL offices in Las Vegas, Nevada. The implementation effectiveness of SNL Quality Assurance Implementing Procedure (QAIP) 20-02, "Scientific Notebooks," Revision 00, was evaluated.

Although one Corrective Action Request (CAR) was issued to identify a calibration non-compliance, overall measures implementing the scientific notebook method for the sampling and testing operations were found to be effective.

A description of CAR YM-93-090 is included in Paragraph 5.1 of this report and an information copy of the CAR is attached.

## 2.0 PURPOSE AND SCOPE

Surveillance YMP-SR-93-043 was conducted to evaluate the effectiveness of implementation of QAIP 20-02 during penetration resistance testing and soil sampling at the UE-25 NRG-2B borehole.

## 3.0 SURVEILLANCE TEAM

John R. Doyle, Surveillance Team Leader, Yucca Mountain Quality Assurance Division/Quality Assurance Technical Support Services (YMQAD/QATSS)
John S. Martin, Quality Assurance Specialist, YMQAD/QATSS

## 4.0 PERSONNEL CONTACTED DURING THE SURVEILLANCE

David Kessel, Principle Investigator, SNL
Carl Brechtel, J. F. Agapito and Associates Inc. (JFTA)/SNL
Dick Lippoth, JFTA/SNL
Ken Skipper, Field Test Coordinator, Yucca Mountain Site Characterization Project Office

## 5.0 SURVEILLANCE RESULTS

Penetration resistance testing and soil sampling operations were observed to be conducted, in general, to United States Bureau of Reclamation (USBR) procedure USBR 7015-89, "Performing Penetration Resistance Testing and Sampling of Soil," which enhances the American Society for Testing and Materials (ASTM) standard test method D-1586-84, "Penetration Test and Split-Barrel Sampling of Soils." In discussions with cognizant SNL representatives as to why a SNL technical procedure

was not generated to implement the ASTM standard or USBR procedure, it was stated that a scientific notebook was employed due to the uncertainty of the impact of the drilling process on the resistance test and the degree of professional judgement necessary to evaluate the validity of the results. It was also stated that deviations from the USBR procedure were to be expected, and these deviations would be recorded within the scientific notebook as allowed by QAIP 20-02.

The surveillance team verified dimensions of sampling and testing tools, verified that the data collected sample information, and any USBR procedural deviations were recorded in the scientific notebook by SNL personnel. The surveillance team also verified that procedures used were those specified in Study Plan YMP-USGS/USBR-SP 8.3.1.14.2.

### 5.1 CAR YM-93-090

SNL QAIP 12-1, Revision 01, "Measuring and Test Equipment Control," requires that measuring and test equipment (M&TE) used in collection of data in support of the Yucca Mountain Site Characterization Project, be fully integrated into the calibration control program.

Contrary to this requirement, SNL utilized M&TE (a Drive Weight Assembly) for the performance of penetration resistance testing and soil sampling which had not been incorportated into the calibration control program.

## 6.0 RECOMMENDATIONS

Soil samples and penetration resistance data has been collected according to USBR procedure; this procedure recommends a drilling method that permits the testing and sampling of undisturbed material. The Odex drilling method used for this activity employs a downhole hammer to advance the casing, which is contrary to procedural recommendations of USBR 7015-89; however, these deviations were recorded in the Scientific Notebook for Geotechnical Core Logging NRG-2b used at the location. There is some question whether this hammer has disturbed the insitu conditions where testing data and samples were collected. A determination of the validity of this data and samples is recommended.

## 7.0 ATTACHMENTS

Attachment 1: Information Copy of CAR-YM-93-090

ATTACHMENT 1

# INFORMATION COPY

# OF

# CORRECTIVE ACTION REQUEST

# ATTACHMENT 1

ORIGINAL
THIS SIDE

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

[8] CAR NO. YM-93-090
DATE: 9-3-93
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QA

## CORRECTIVE ACTION REQUEST

[1] Controlling Document
QAIP 12-1, Revision 01

[2] Related Report No.
YMP-SR-93-043

[3] Responsible Organization
Sandia National Laboratories

[4] Discussed With
Robert Richards and Dave Kessel

[5] Requirement:

QAIP 12-1, Revision 01, paragraph 4.1, step 1 states in part: "The PI or designee shall ensure that measuring and test equipment used in the collection of data in support of the YMP is fully integrated into the calibration and control program..."

[6] Adverse Condition:

Contrary to the above requirement, SNL has utilized test equipment, for the collection of quality affecting data, which has not been integrated into the calibration and control program. An example of this deficiency is the use of a Drive Weight Assembly in the performance of penetration resistance testing and sampling of soil. The Drive Weight Assembly was used on borehole NRG-2B on August 30, 1993.

[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:

1) Provide for the calibration of the Drive Weight Assembly and report results thereof. If results of calibration determine that the assembly is not within tolerances; evaluate the validity of the data and report results. 2) Determine the extent of like

(see page 2 for continuation)

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|---|---|
| [7] Initiator: John S. Martin — Date: 9-3-93 | [14] Issuance Approved by: QADD [signature] for — Date: 09-08-93 |
| [16] Response Accepted: QAR — Date | [19] Response Accepted: QADD — Date |
| [17] Amended Response Accepted: QAR — Date | [18] Amended Response Accepted: QADD — Date |
| [15] Corrective Actions Verified: QAR — Date | [20] Closure Approved by: QADD — Date |

REV. 08/91

# ATTACHMENT 1
(Continuation)

OFFICE OF CIVILIAN
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WASHINGTON, D.C.

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## CORRECTIVE ACTION REQUEST (Continuation Page)

Block 13 continued:

deficiencies and report results. If other deficiencies are identified provide methodology for correction and an evaluation for impact. 3) Provide methodology to preclude recurrence.