Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 98608
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JUN 16 1995

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ISSUANCE OF SURVEILLANCE RECORD YMP-SR-95-031 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION'S (YMQAD) SURVEILLANCE OF THE CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT AND OPERATING CONTRACTOR (CRWMS M&O) (SCPB: N/A)

Enclosed is the record of Surveillance YMP-SR-95-031 conducted by the YMQAD at the CRWMS M&O facilities at the Yucca Mountain Site, Nevada, May 15-19, 1995.

The purpose of the surveillance was to verify that preservation of in-situ borehole conditions is a requirement for site characterization activities.

No Corrective Action Requests were issued as a result of this surveillance. This surveillance is considered completed and closed as of the date of this letter. A response to this surveillance record and any documented recommendations is not required.

If you have any questions, please contact either Mario R. Diaz at 794-7974 or John R. Doyle at 794-7986.

R. E. Spence

Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

YMQAD:MRD-3610

Enclosure:
Surveillance Record
YMP-SR-95-031

NH03
WM-11
102.7

YMP-5

Surveillance No. YMP-SR-95-031

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

QUALITY ASSURANCE SURVEILLANCE RECORD

SURVEILLANCE DATA

[1]ORGANIZATION/LOCATION:	[2]SUBJECT:	[3]DATE: 5/15 through 19/95
Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O), Yucca Mountain Site, Nevada	Preservation of in-situ borehole conditions	

[4]SURVEILLANCE OBJECTIVE:
Verify that preservation of in-situ borehole conditions is a requirement for site characterization activities.

[5]SURVEILLANCE SCOPE:
Document review of upper tier requirements and interviews with cognizant personnel to determine if preservation of in-situ borehole conditions during borehole coring process is a requirement of Surface Based Testing site characterization activities.

[6]SURVEILLANCE TEAM:
Team Leader:
John R. Doyle
Additional Team Members:
Paul Hale

[7]PREPARED BY:	[8]CONCURRENCE:
J. R. Doyle (John R Doyle.) 5/12/95	NA
Surveillance Team Leader — Date	QA Division Director — Date

SURVEILLANCE RESULTS

[9]BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS:

See Page(s) 2

[10]SURVEILLANCE CONCLUSIONS:

See Page(s) 4

[11]COMPLETED BY:	[12]APPROVED BY:
John R Doyle. 6/9/95	6/15/95
Surveillance Team Leader — Date	QA Division Director — Date

ENCLOSURE

(Block 9 continued) BASIS OF EVALUATION /DESCRIPTION OF OBSERVATIONS

A surveillance was performed of the CRWMS M&O, and Reynolds Electrical and Engineering Co., Inc. (REECo) at the Yucca Mountain Site relative to concerns of U.S. Department of Energy (DOE) personnel raised by letter, Wright to Wonderly, dated April 14, 1995. Subject letter addressed concerns raised over drilling problems at USW UZ-7a and UE-25 UZ #4, in particular the dusty borehole conditions at USW UZ-7a.

Based on this, DOE personnel requested that a surveillance be performed to determine if a requirement exists for preserving in-situ conditions during Unsaturated Zone (UZ) borehole drilling, specifically whether dusting of the borehole compromised any subsequent testing.

Without an air monitoring system that functions properly, the borehole wall has a tendency to become coated with dust which could compromise in-situ conditions and quality of data collected from the borehole.

During the course of the surveillance, daily drilling reports were reviewed to determine the sequence of events that led to this concern. Drilling operations commenced for USW-UZ-7a on March 22, 1995, with the air monitoring system in place and operating. Problems with the air measurement system were detected on April 13, 1995 and operations were suspended on April 17, 1995, when it was noted in the daily drilling report that the air volumes were suspect. Operations resumed on April 21, 1995 with difficulties arising on the swing shift. Operations were again suspended and work performed on the system. Operations resumed on April 25, 1995. Conversations with cognizant personnel revealed that the air-metering equipment was installed at the beginning of operations, although not specifically required in the approved work program. During the course of the surveillance, a revision to this work program was initiated to include the provision for an air monitoring system to be in place.

A review of Study Plan 8.3.1.2.2.3 "Unsaturated Zone Drilling Program" that drives this UZ activity revealed that dusting was to be expected and that provisions would take place after drilling operations to remove these fine cuttings. Paragraph 2.2.3.1 states, "It can be expected that "dry" drilling will remove moisture from the borehole environment, and that fine cuttings will be deposited along the borehole wall (these can be removed by brushing and vacuuming the borehole)."

During the course of this surveillance a review of work programs was accomplished. These reviews were performed to ascertain general requirements for air monitoring systems and their application. Based on these reviews, it was found that no standardized methodology/requirement exists for air monitoring systems outside of the work program. The following are examples of work program requirements:

(Block 9 continued) BASIS OF EVALUATION /DESCRIPTION OF OBSERVATIONS

YMP/WP/92-03, Revision 1, UE-25 UZ-16 Vertical Seismic Profile Borehole Work Program, Section 3.11 states that the circulating medium shall be compressed air; and the volumes from the air compressors and the vacuum drilling system shall be metered through the air meter runs complete with recorders.

YMP/WP/93-09, Revision 1, USW UZ-14 Borehole Work Program, Section 4.3.2.1 requires the volumes from the air compressors and the vacuum drilling system to be metered through the air meter runs. **Section 4.6.1** states that the discharge air will be augmented by vacuum withdrawal and metering. The flow rate out will always be greater than the drilling air injected, unless dictated by hole conditions and approved by the DOE/FTC. **Section 4.6.3** states that discharge velocities shall be greater than 3,000 feet per minute in all vertical sections of the borehole and 7,500 feet per minute in horizontal flow lines to the primary cuttings cycle.

YMP/WP/93-18, Revision 0, USW SD-12 Borehole Work Program Section, 3.3.3 requires volumes from the air compressors and vacuum drilling system to be metered through air meter runs.

YMP/WP/95-01, Revision 0, UE-25 UZ #4 Workover and Instrumentation/Stemming Program, Section 4.2.3 requires air volumes from the air compressors to be metered through an air meter run.

YMP/WP/95-02, Revision 0, USW UZ-7a Borehole Work Program - No Requirement in place at the time of the surveillance.

In addition to the above, the following documents were also reviewed.

SP 8.3.1.2.2.3 "Characterization of the Yucca Mountain Unsaturated -Zone Percolation," Revision 0

SP 8.3.1.2.2.6 "Characterization of the Yucca Mountain Unsaturated-Zone Gaseous Phase Movement," Revision 1

SP 8.3.1.2.2.7 "Hydrochemical Characterization of the Unsaturated Zone," Revision 1

The following individuals were contacted during the course of this surveillance:

Roy Long	Principle Engineer, DOE
Wayne Straight	Lead Quality Assurance (QA) Field Specialist, Integrated Resources Group
Dave Wonderly	Drilling Superintendent, REECo
J. Rickey Joyce	Senior Drilling Engineer, REECo

(Block 9 continued) BASIS OF EVALUATION /DESCRIPTION OF OBSERVATIONS

Michael Chornak	Geologic Studies Chief, United States Geological Survey (USGS)
Ken Skipper	Physical Scientist, DOE
Eddie Wright	Engineering Supervisor, CRWMS M&O Science Applications International Corporation (SAIC)

(Block 10 continued) SURVEILLANCE CONCLUSIONS

Based on these reviews, there is no standardized or consistent methodology for air monitoring and metering controls. A further review of the Surface Based Testing Facilities Requirements Document (SBTFRD) reveals that there is no requirement for airflow metering or monitoring.

Based on the results of this surveillance, it has been determined that M&O SAIC and REECo are effectively and adequately implementing quality-affecting activities regarding borehole drilling.

The following recommendations require no response and are for management consideration;

RECOMMENDATION 1

The omission of the "requirement" for air metering measurements and recording is determined to be an isolated occurrence based on the review of other work programs. The "requirement" for monitoring differential air pressures originates from the USGS wanting to maintain as clean a borehole as possible. If the desire to maintain a clean borehole has the potential to impact data used for licensing purposes, then a requirement needs to be added to the SBTFRD or delineated within the applicable Study Plan and Work Program.

RECOMMENDATION 2

Inconsistent wording is used when requiring air monitoring to be part of the work program.

SPECIFIC EXAMPLES:

"Air volumes from the air compressors shall be metered through the air meter run." (YMP/WP/95-01)

"Volumes from the air compressors **and** vacuum drilling system shall be metered through air meter runs." (YMP/WP/93-18)

(Block 10 continued) SURVEILLANCE CONCLUSIONS

"Volumes from the air compressors and the vacuum drilling system shall be metered through the air meter runs. Discharge air will be augmented by vacuum withdrawal and metering. The flow rate out will always be greater than the drilling air injected; and that discharge velocities shall be greater than 3,000 feet per minute in all vertical sections of the borehole and 7,500 feet per minute in horizontal flow lines to the primary cuttings cycle." (YMP/WP/93-09)

"Volumes from the air compressors and the vacuum drilling system shall be metered through the air meter runs complete with recorders." (YMP/WP/92-03)

Although there was a section of each work program devoted to implementing the desire of USGS to maintain as clean a borehole as possible, there is an inconsistency in the method in which this desire is described in the respective work programs.

Provide consistent language in future work programs when conveying the need to maintain as clean a borehole as possible.

cc w/encl:
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