



Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
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ISSUANCE OF SURVEILLANCE RECORD YMP-SR-96-016 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION'S (YMQAD) SURVEILLANCE OF THE CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT AND OPERATING CONTRACTOR AT LOS ALAMOS NATIONAL LABORATORY (LANL) (SCPB: N/A)

Enclosed is the record of Surveillance YMP-SR-96-016 conducted by the YMQAD at the LANL facilities at the Yucca Mountain Site, Nevada, May 15 through June 17, 1996.

The purpose of the surveillance was to verify compliance with the Quality Assurance Requirements and Description (QARD) document requirements, standard industry practices, and LANL procedure LANL-EES-13-DP-612, Revision 0, relative to the collection of core samples by LANL within the Exploratory Studies Facility.

One Performance Report and one Deficiency Report (DR) were issued as a result of this surveillance. Response to the DR, which was transmitted via separate letter, is due by the date indicated in Block 10 on the DR.

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; however, the open DR will continue to be tracked until it is closed to the satisfaction of the quality assurance representative and the Director, Office of Quality Assurance.

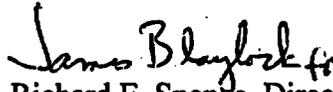
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If you have any questions, please contact either Mario R. Diaz at (702) 794-1489 or John S. Martin at (702) 794-5591.


Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

YMQAD:MRD-2250

Enclosure:
Surveillance Record YMP-SR-96-016

cc w/encl:

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

QUALITY ASSURANCE SURVEILLANCE RECORD

SURVEILLANCE DATA

¹ORGANIZATION/LOCATION:
Los Alamos National Laboratory
(LANL) and the Sample
Management Facility (SMF),
Yucca Mountain Site, Nevada

²SUBJECT: Processing of core samples
from the Exploratory Studies Facility (ESF)
by LANL

³DATE: 5/15/96 - 6/17/96

⁴SURVEILLANCE OBJECTIVE: To verify compliance with Quality Assurance Requirements and Description (QARD) document requirements, standard industry practices, and LANL procedure LANL-EES-13-DP-612, Revision 0, relative to the collection of core samples by LANL within the ESF.

⁵SURVEILLANCE SCOPE: The scope of the surveillance was to evaluate LANL ESF core processing, storage, transportation, and handling.

⁶SURVEILLANCE TEAM:
Team Leader:

John S. Martin

Additional Team Members:

N/A

⁷PREPARED BY:

John S. Martin 5/14/96

Surveillance Team Leader Date

⁸CONCURRENCE:

N/A

QA Division Director Date

SURVEILLANCE RESULTS

⁹BASIS OF EVALUATION/DESCRIPTION OF OBSERVATIONS:

See Page(s) 2-6

¹⁰SURVEILLANCE CONCLUSIONS:

See Page 6-7

¹¹COMPLETED BY:

John S. Martin
Surveillance Team Leader

Date

7/23/96

¹²APPROVED BY:

James Blaylock for
QA Division Director

Date

7/23/96

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

A surveillance was conducted May 15 through June 17, 1996, of ESF core processing by LANL's Test Coordination Office in accordance with LANL procedure LANL-EES-13-DP-612, Revision 0, "Identification, Collection, and Handling of Non-Required Assigned Core in the ESF." The surveillance was conducted at the ESF Pad and the SMF. Subsequent to the actual surveillance of the core processing, numerous follow-up meetings and discussions were held. A closeout meeting was conducted on June 17, 1996, to discuss the results of the surveillance. The surveillance consisted of personnel interviews, procedure review for quality and technical adequacy, and visual observation of the results of the LANL ESF core processing.

As background, project history shows that considerable amounts of time and monies were expended relative to how the Project was to handle and process core samples. This was the result of concerns from the U.S. Nuclear Regulatory Commission (NRC) and deficiencies, relative to the processing of core, identified by Project personnel during the mid to late eighties (*reference: Letter dated November 18, 1985, from John J. Linehan, Section Leader, Repository Projects Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, NRC, to Dr. Donald Vieth, Director, Waste Management Project Office, U.S. Department of Energy (DOE), Nevada Operations Office; and DOE Quality Assurance Surveillance Report Number WMPO/NV-SR-86-022*). Based on these concerns and deficiencies, a Project program evolved where strict quality and technical controls for handling core were developed. Some of these controls were translated into quality requirements which now reside in the QARD document, Supplement II, "Sample Control." Technical requirements based on industry standards and methodologies of doing business to ensure core integrity and collection of necessary site data also evolved and were included into specific site procedures.

In general, the geologic characteristics and the intended use of core determines the type of program required. If engineering properties are to be determined from the core, it must be handled and preserved in such a way that the measured properties are not significantly influenced by mechanical damage, changes in chemistry, and environmental conditions of moisture and temperature, from the time that the core is recovered from the drill until testing is performed. Drill core is also the sample record for the subsurface geology at the borehole location, and as such must be preserved for some period of time, in some cases indefinitely, for future geologic study or potential licensing processes.

Presently, Project personnel cannot ascertain all potential uses of core collected in the performance of surface- and subsurface-based testing and construction activities. Nor were personnel able to comprehend all potential uses of core samples when the quality and technical program was revamped based on NRC concerns and deficiencies identified by Project personnel during the mid to late eighties.

During the early part of March 1996, the U.S. Department of Energy (DOE)/ Assistant Manager Scientific Programs (AMSP) staff noted that core from drill holes was being deposited on the floor of the ESF and subsequently discarded. The drill holes from which the core came were not specifically drilled for core acquisition, but were drilled with a bit that produced core as result of the need for a uniform hole for instrumenting. The core from these boreholes was not requested by the scientific community and had no predetermined requirements for specific site characterization activities. As a result, Construction was discarding the core from the drill holes onto the rubble pile at the ESF Pad.

DOE/AMSP staff believes the discarding of core to be a sensitive issue that could invite unnecessary criticism from Project oversight personnel and others. Based on this, guidance was provided by the DOE/AMSP staff that any core drilled of this type be retained for possible use in ongoing or future site characterization activities. It was also stipulated by AMSP that in taking drill core it be accomplished in accordance with proper QA controls and in a rigorous, defensible manner (*reference: DOE Technical Guidance letters to TRW Environmental Safety Systems, Inc: AMSP:WAG-1337, dated March 13, 1996; and AMSP:WAG-1627, dated April 29, 1996*).

In response to DOE's guidance to collect drill core within the ESF, the LANL Test Coordination Office chose to generate LANL procedure LANL-EES-13-DP-612 which had an effective date of April 1, 1996, in lieu of utilizing a SMF procedure for the work activity. This was accomplished due to the belief, by the LANL Test Coordination Office, that the SMF/Drilling Support procedures were cumbersome to utilize, contained unnecessary technical requirements, and were overly prescriptive.

The LANL Test Coordination Office staff collected core from two drill holes in accordance with LANL-EES-13-DP-612. The drill holes were identified as ESF-Thermal Mechanical Alcove (TMA)-Electrical Resistance Transducer (ERT)-1 and ESF-TMA-ERT-2 located on the north face of the Thermo Mechanical Test Block within the ESF. Core from these drill holes was collected and subsequently transferred to the SMF after storage by LANL at the ESF Pad. ESF-TMA-ERT-1 was started on April 5, and completed on April 8, 1996, to a total reported drill hole depth of 28.97 feet. Three boxes of core were recovered on the 5th, and two boxes of core were recovered on the 8th. ESF-TMA-ERT-2 was started on April 9, and completed on April 10, 1996, to a total reported depth of 28.93 feet. Two boxes of core were recovered on the 9th and three boxes of core were recovered on the 10th.

Note: Subsequent to LANL acquiring core from these two drill holes, the SMF/Drilling Support staff modified their procedure Nevada Work Instruction (NWI)-DS-001Q, Revision 2, "Field Logging, Handling, & Documenting Borehole Samples" to address the processing of non-assigned/non-allocated core. Future core processing by the LANL Test Coordination Office will be accomplished in accordance with the SMF/Drilling Support procedure.

Visual examination of the core was performed at the SMF by the surveillance team. Upon examination it was noted the core had not been annotated with core orientation marking. Marking of core for orientation purposes is accomplished so that later users will always be able to distinguish the top of the core from the bottom in the event of an accident or mishandling. Nor was there any indication of footages being marked on the core to indicate the depth the core came from in the drill hole. These attributes are standard practice throughout industry and are provided as guidelines in standards such as American Society for Testing and Materials (ASTM) D 5079-90. LANL did attempt to provide a modest degree of orientation by annotating the core boxes with overall footage intervals; however, this methodology fails to provide for the positive orientation as adopted by the Project. As a result, Nonconformance Report (NCR) YMSCO-96-0044 was generated to document that orientation for the core for these two drill holes is indeterminate.

Documentation reviews of LANL sample collection activities were also performed during the course of the surveillance. These reviews were performed to determine compliance with LANL procedural requirements relative to LANL-EES-13-DP-612. Overall, documentation was found to be completed in compliance with LANL procedural requirements. However, there was an inconsistency noted during review. The area noted is in regards to Paragraph 6.5.2.3 Note, which states in part, that core "Measurement must be taken to the nearest 1/100th of a foot.... ." In review of the ESF Drilling Shift Report forms associated with ESF-ERT-1 and -2, it was noted that the form stipulated: "All measurements shall be taken to the nearest 1/10 of an inch." This discrepancy was evident to the collector of the core and the 1/10 of an inch notation on the form was one-lined, initialed, and dated, and changed to 1/100 of a foot. This discrepancy is documented on Performance Report (PR) YM-96-P-029 for resolution.

A review of LANL procedure LANL-EES-13-DP-612, Revision 0, was performed to assess compliance with QARD and technical requirements, in addition to standard industry practices, previously established by the Project for processing, storage, shipping, and handling of core samples. The questions were derived from ASTM D 5079-90, International Society for Rock Mechanics (ISRM) Rock Characterization Testing and Monitoring Suggested Methods, the QARD, NRC concerns, and previously identified deficiencies by Project personnel:

Question: Does the procedure address and describe core recovery when the material recovered includes rubble?

Results: No.

Question: Does the procedure address and describe measurement of recovered core and comparison of the length of core reported by the driller? This includes resolution of those instances where core recovered is less than that drilled and those instances where the core recovered exceeds that which is drilled.

Results: No.

Question: Does the procedure address and describe the logging and photography of core and in what time frames this is to be accomplished and to what extent the logging is to be performed? The logging should include natural fracture zones and those induced by the drilling and handling processes.

Results: No.

Question: Does the procedure address and describe the marking and orientation of core?

Results: Procedure does address marking and orientation of core. However, the procedure does not clearly describe the technical methodology to be utilized in providing positive core orientation.

Question: Does the procedure address and describe how unrecovered zones of core are to be handled?

Results: No.

Question: Did the procedure address and describe core custody and documentation?

Results: Yes.

Based upon the above evaluation, the QARD requirement for core orientation will be added to PR YM-96-P-029 for resolution. Other requirements not contained in LANL procedures are addressed by Deficiency Report (DR) YM-96-D-065 issued to AMSP and described below.

An evaluation was also performed of the Civilian Radioactive Waste Management System Management and Operating Contractor's (CRWMS M&O) SMF/Drilling Support procedure NWI-DS-001Q, Revision 2. During this evaluation it was found that the requirements for photography and the generation of a lithologic log had been deleted from the procedure for nonassigned/nonallocated core. These technical requirements, along with many others, were originally placed in the SMF/Drilling Support procedures to be performed on all core as a result of the NRC concerns and deficiencies identified by Project personnel previously noted in this report. In discussions with DOE/AMSP personnel it was stated that this information is considered basic information the Project needs to retain and is considered standard industry practice. It was also stated that all core should be processed in the same manner unless specific instructions are provided by the principal investigators.

QARD Section 5.0, Paragraph 5.2.2 B, requires that appropriate technical requirements be listed within implementing documents; however, there is no Project plan or upper tier document that delineates the minimum technical requirements for processing core. As personnel retire and/or leave the project, it appears the Project memory and rationale of what lead to certain technical

requirements being implemented is lost. During discussions with DOE/AMSP, LANL Test Coordination Office, and SMF/Drilling Support personnel, confusion existed between each group, as to what was considered the necessary minimum set of technical requirements needed for core processing. Specifically, confusions existed in what were the technical requirements needed from ASTM D 5079-90, ISRM, etc.

Based on this, DR YM-96-D-065 is being issued to establish the minimum appropriate technical requirements within implementing documents in accordance with Section 5.0, Paragraph 5.2.2 B of the QARD.

The following personnel were contacted during the course of the surveillance:

William J. Boyle	DOE/AMSP
Andrew G. Burningham	LANL/Quality Assurance (QA), Test Coordination Office
Diane E. Donovan	CRWMS M&O
Susan B. Jones	DOE/AMSP
Christopher C. Lewis	CRWMS M&O/SMF
Candace L. Lugo	CRWMS M&O
Alan J. Mitchell	LANL/Test Coordination Office
Ronald D. Oliver	LANL/Test Coordination Office
Wesley C. Pugmire	CRWMS M&O/QA
Claude G. Scroggins	CRWMS M&O/SMF
Nicholas Stellavato	Nye County, On-Site Representative
Kenneth J. Skipper	DOE/AMSP
Richard E. Spence	DOE/YMQAD, Yucca Mountain Quality Assurance Division
W. Arch Girdley	DOE/AMSP

BLOCK 10 (continued) SURVEILLANCE CONCLUSIONS:

Based upon the results of this surveillance, the overall adequacy of LANL's implementation of quality and technical requirements for the collection of drill hole core within the ESF was found to be unsatisfactory. LANL has ceased collecting core in accordance with their program and will utilize the SMF drilling support quality program for future core collection and processing. There was one PR, one DR, and one NCR generated as a result of this surveillance.

A synopsis of the deficiency/nonconformance reports generated as a result of this surveillance is as follows:

NCR YMSCO-96-0044 documents that core from drill holes ESF-TMA-ERT-1 and -2 was not annotated with positive orientation markings, thereby rendering the orientation of the drill core indeterminate.

PR YM-96-P-029 documents procedural inadequacies in delineating a methodology for providing positive control relative to the orientation of core and discrepancies between a LANL procedure and Shift Drilling Report Forms.

DR YM-96-D-065 documents failure in establishing the minimum technical requirements for the collection and processing of core.

The following recommendation is provided for consideration as a result of this surveillance:

- 1) DOE, as the owner, retains ultimate responsibility for all core recovered from drill holes and boreholes. These core samples and associated documentation may be utilized during licensing and at the very least provide a permanent record of ground geology, lithology, and conditions encountered. During the course of the surveillance it was found that all procedures addressing the handling, shipping, and storage of core and project samples resided at the contractor line level responsible for implementation. These procedures have alternated back and forth between being Office of Civilian Radioactive Waste Management Administrative Procedures (AP) and contractor line procedures over the past seven years. It is recommended that DOE initiate action to have these procedures returned to APs or Yucca Mountain APs assume and maintain responsibility, through review and approval, assuring that quality and technical requirements deemed necessary by Project are included. Knowledge of past commitments and the rationale of what led to the development of specific programs should not be entrusted to others who may not have the knowledge or background for the task specifics.