

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

AUDIT REPORT

OF THE

**CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM
MANAGEMENT AND OPERATING CONTRACTOR**

AT

KIEWIT/PARSONS BRINCKERHOFF

LAS VEGAS, NEVADA

**AUDIT NUMBER YM-ARP-96-09
MARCH 25 THROUGH 29, 1996**

Prepared by:

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Date:

4-16-96

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Enclosure 1

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1.0 EXECUTIVE SUMMARY

As a result of Performance Based Quality Assurance (QA) Audit YM-ARP-96-09, the audit team determined that the Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O) at Kiewit/Parsons Brinckerhoff (Kiewit/PB) is satisfactorily implementing an adequate and effective QA program and process controls with regards to selected rockbolt work packages developed under Work Breakdown Structure (WBS) 1.2.6.4.2, "First Access Topapah Spring Excavation." The Kiewit/PB program examined during this audit is in accordance with the U.S. Department of Energy (DOE) Office of Civilian Radioactive Waste Management Quality Assurance Requirements and Description (QARD) document DOE/RW-0333P, Revision 5. In addition, adequacy of and compliance to selected Kiewit/PB Management Control, Technical Control, and Quality Control (QC) procedures were found to be satisfactory.

Audit YM-ARP-96-09 was a performance based audit of activities associated with the engineering, installation, and inspection of "Williams" and "Super Swellex" rockbolts installed in the Exploratory Studies Facility (ESF). Work packages 2.23.3 C for "Williams" and 2.23.4 I for "Super Swellex" rockbolts were reviewed during the course of the audit. These two packages were produced by Kiewit/PB and were evaluated to determine whether they were acceptable in meeting the needs of the Yucca Mountain Site Characterization Project and were prepared under the QA controls required by the QARD.

The audit team did not identify any deficient conditions during the audit; therefore no Corrective Action Requests, Deficiency Reports, or Performance Reports were issued. There were six recommendations for process improvements resulting from the audit, which are detailed in Section 6.0 of this report.

2.0 SCOPE

The performance based audit was conducted to evaluate the adequacy and effectiveness of Kiewit/PB's controls for generating work packages 2.23.3 C for "Williams" and 2.23.4 I for "Super Swellex" rockbolts. The audit was intended to determine the degree to which the resultant products meet the program requirements and management commitments and expectations; as well as to determine that Kiewit/PB completed the work in accordance with the pertinent sections of the QARD.

The process/activities/end-products evaluated during the audit, in accordance with the approved audit plan, are as follows:

PROCESS/ACTIVITY/END-PRODUCT

Based on scoping discussions with the Kiewit/PB QA Manager and Assistant Engineering Manager, two work packages from WBS 1.2.6.4.2, "First Access Topapah Spring Excavation," were selected for evaluation. The specific work packages evaluated were 2.23.3 C for "Williams" and 2.23.4 I for "Super Swellex" rockbolts.

The performance based evaluation of process effectiveness and product acceptability was based on:

1. Satisfactory implementation of the critical process steps;
2. Use of trained and qualified personnel working effectively;
3. Documentation that substantiates the quality of the products; and
4. Acceptable results and adequate end-products.

The Kiewit/PB critical process steps involved in the development of the audited deliverables were as follows:

- Work process description
- Work packages
- Procurement, order, and receipt of materials
- Initiation and completion of travelers
- Master Work Package compilation and close out

In addition, a sample of the applicable QA program requirements and controls as they applied to the deliverable was examined to evaluate the degree of compliance. The following QA program elements selected are directly related to Kiewit/PB's activities in generating work packages 2.23.3 C and 2.23.4 I. These elements were included:

- 2.0 QA Program
- 3.0 Design Control
- 4.0 Procurement Document Control
- 5.0 Implementing Documents
- 6.0 Document Control
- 7.0 Control of Purchased Items and Services
- 10.0 Inspection
- 12.0 Control of Measuring and Test Equipment (M&TE)
- 13.0 Handling, Storage, and Shipping
- 15.0 Nonconformances
- 16.0 Corrective Action
- 17.0 QA Records

TECHNICAL AREAS

There were no technical areas evaluated during the audit.

3.0 AUDIT TEAM AND OBSERVERS

The following is a list of the audit team members and observers and their assigned areas of responsibility:

<u>Name/Title/Organization</u>	<u>QA Program Elements/Requirements, Processes, Activities, or End-Products</u>
Patrick V. Auer, Audit Team Leader, Yucca Mountain Quality Assurance Division (YMQAD)	QA Program Elements directly related to support of the end-product, QA Elements 2.0, 3.0, 5.0, 6.0, 17.0, process steps for development of Work Process Description, Work Package, and Master Work Package compilation and close out.
John R. Doyle, Auditor, YMQAD	QA Program Elements directly related to support of the end-product, QA Elements 2.0, 5.0, 6.0, 10.0, 12.0, 13.0, 15.0, 16.0, 17.0, process steps for development of Work Process Description, Work Package, and Initiation and Completion of Travelers.
Sam H. Horton, Auditor, YMQAD	QA Program Elements directly related to support of the end-product, QA Elements 4.0, 5.0, 7.0, 10.0, 13.0, 17.0, process steps for procurement, order, and receipt of materials.
Susan W. Zimmerman, Observer, State of Nevada	

4.0 AUDIT MEETINGS AND PERSONNEL CONTACTED

A preaudit meeting was held at the Kiewit/PB offices in Las Vegas, Nevada, on March 25, 1996. A daily debriefing and coordination meeting was held with Kiewit/PB management and staff, and daily audit team meetings were held to discuss issues and potential deficiencies. A daily audit team meeting was also held each evening to coordinate the pace of the audit, to discuss issues, process recommendations, and

present potential deficiencies. The audit was concluded with a postaudit meeting held at Kiewit/PB's offices in Las Vegas, Nevada, on March 29, 1996. Personnel contacted during the audit are listed in Attachment 1. The list includes 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, Kiewit/PB's process controls are adequately and effectively being implemented for areas identified in the scope of this audit. The process controls for the generation of work packages 2.23.3 C for "Williams" and 2.23.4 I for "Super Swellex" rockbolts were found to be effective and the products are adequate for the needs of the project.

During the audit, various procurement packages were reviewed to determine if applicable documentation was available to verify that the material dedication process was being implemented. Kiewit/PB recognized a potential problem with the fragmentation of their procurement record packages. Kiewit/PB immediately put forth an effort and completed the records packages so they could be submitted into the records system.

During the audit, a determination was made if any special precautions were taken by Kiewit/PB to preclude damage to rockbolts during their storage on the ESF pad after release from the QC hold area. Interviews with QC personnel revealed that "informal biweekly inspections" were being made by QC personnel to assure that rockbolts were being stored to prevent damage (e.g., stored in accordance with manufacturer's recommendations). Kiewit/PB surveillance SR-96-20 included a recommendation (#4) which proposed that "a work package be developed to contain monitoring for storage of "Q" materials and discrepancies be reported in more detail." It was verified during the audit that Kiewit/PB had implemented the recommendation via Work Package 1.16, "Miscellaneous Surveillance Activities." The work package contained a formal biweekly surveillance checklist which would be implemented beginning the week of March 16, 1996.

The CRWMS M&O specification (BABEAB000-01717-6300-02165), referred to as "Specification 2165," specifies the requirements Kiewit/PB must adhere to when procuring, installing, and inspecting rockbolts. This specification has been revised six times in a period of ten months. These revisions have caused substantial changes in the classification of the items associated with the specification as well as substantially reduced the requirements for material dedication testing of "Q Commercial Grade" procured items. There was some

difficulty in ascertaining the effectiveness of the material dedication process due to the ever changing material dedication testing requirements; however, documentation was available to verify the material dedication test was done in accordance with the specification in effect at that time.

The constant specification/design changes make it increasingly difficult to demonstrate what has been done in the past. It is imperative that, regardless of the amount of changes made to requirements, the project can justify those changes and documentation exists to show objective evidence of what was in effect for the time period in question. Material dedication testing is just one potential area where the project should stabilize ever changing requirements. (See Recommendations 5 and 6)

5.2 Stop Work or Immediate Corrective Action Taken

There were no Stop Work Orders, immediate corrective actions, or related additional items resulting from this audit.

5.3 QA Program Audit Activities

A summary table of audit results is provided in Attachment 2. The details of the audit evaluation, along with the objective evidence reviewed, are contained within the audit checklist. The checklists are kept and maintained as QA records.

5.4 Technical Audit Activities

There were no technical areas evaluated during this audit.

5.5 Summary of Deficiencies

No deficiencies were identified during the audit.

5.5.1 Corrective Action Requests (CAR)

None

5.5.2 Deficiency Reports (DR)

None

5.5.3 Performance Reports (PR)

None

5.5.4 Deficiencies Corrected During the Audit

None

5.5.5 Follow-up of Previously Identified CARs and DRs

There were no previously issued CARs or DRs that were determined to be applicable to the scope of this audit.

6.0 RECOMMENDATIONS

The following recommendations resulted from the audit and are presented for consideration by Kiewit/PB, CRWMS M&O, and DOE management:

1. It is recommended that Kiewit/PB start submitting incomplete work packages to the records system rather than wait until items in the package are complete. Kiewit/PB can then either update or amend the packages as incomplete items and appropriate reviews are completed. This would add additional protection from damage or loss.
2. Kiewit/PB should determine the reason why they sign off on the Proof Load Pull Test Values form contained in CRWMS M&O Nevada Line Procedure NLP-3-29, "Documentation of Title III Implementing Actions." Kiewit/PB signatures are not required and do appear to signify acceptance of any work.
3. During the audit, several personal copies of procurement packages were found to have original quality documents such as Receiving Inspection Report sheets. It is recommended that original records in the copies of files be placed in the appropriate records package. This would help eliminate the potential for illegible records in the records system.
4. The Receiving Inspection Plan (RIP) comments sections for the RIPs examined during the audit had such notes as; (1) awaiting test results, (2) no certificate of conformance received, (3) plates do not meet the manufacturer's dimensional requirements, etc. There is no indication that these comments have been resolved on the RIP. Through investigation it was determined that the quality control inspector's stamp in the "accept" block negates these types of comments and they had, in fact,

been resolved. It is recommended that when entries on future RIPs show unresolved issues regarding material, procedure controls be specified and implemented to ensure these comments are documented as reconciled prior to the inspector accepting the material.

5. This recommendation concerns the new Revision 0 of Specification 2165 which is scheduled to be issued in April 1996. After the specification is issued and sufficient time has been allowed for implementation, it is recommended that an audit or surveillance be performed of the material dedication testing process, as it is currently being performed, for items that are being procured as "Q commercial grade." The surveillance should verify effectiveness of the current material dedication testing process and provide assurance that documentation exists to show objective evidence of the material dedication testing process.
6. This recommendation also concerns the new revision of Specification 2165. The new revision upgrades most of the ground support system to "Q" classification. This action will apparently require a retrofit of ground support items (e.g., Super Swellex, split sets, welded wire fabric, etc.) that were installed as "Non-Q." It is recommended that DOE perform an evaluation of the retrofit effort throughout the course of the "upgrades" to ensure acceptability of the process.

7.0 LIST OF ATTACHMENTS

- Attachment 1: Personnel Contacted During the Audit
- Attachment 2: Summary Table of Audit Results

ATTACHMENT 1
Personnel Contacted During the Audit

Name	Organization/Title	Preaudit Meeting	Contacted During Audit	Postaudit Meeting
Armstrong, R.	Kiewit/PB - Quality Engineering Manager	X	X	X
Bennet, R.	CRWMS M&O - Surveillance		X	
Christensen, J.	Kiewit/PB - QA Manager	X	X	X
Copeland, J.	Kiewit/PB - Engineering Support Supervisor		X	
Cox, H.	Kiewit/PB - QC Manager		X	X
Edwards, C.	Kiewit/PB - Assistant Engineering Manager	X		X
Franks, D.	CRWMS M&O - QA Surveillance Manager	X	X	X
Garret, C.	CRWMS M&O - Lead Title III Subsurface		X	
Glasser, W.	CRWMS M&O - Construction QA		X	X
Haas, C.	Kiewit/PB - Training Coordinator		X	
Haas, D.	Kiewit/PB - Procurement Quality Engineer		X	
Hackbert, D.	CRWMS M&O - Surveillance Specialist			X
Harper, F.	Kiewit/PB - QC Receiving Lead		X	
Johnson, C.	Kiewit/PB - Tunnel Superintendent		X	
Kehrman, B.	CRWMS M&O - Title III Field Engineer		X	
Kennedy, W.	CRWMS M&O - Lead Discipline Engineer, Mining		X	
Kiefer, G.	CRWMS M&O - Mining Engineer		X	
Krank, K.	Kiewit/PB - Quality Coordinator			X
Limon, K.	Kiewit/PB - Deputy Manager			X
Pugmire, W.	CRWMS M&O - Surveillance		X	
Rixford, C.	Kiewit/PB - Records Manager		X	
Schuermann, S.	Kiewit/PB - QA Surveillance Supervisor		X	
Spence, K.	Kiewit/PB - Lead Document		X	
Warren, C.	YMQAD - Quality Verification Lead			X
Wightman, W.	Kiewit/PB - Project Manager	X		
Williams, B.	Kiewit/PB - Training Specialist		X	

ATTACHMENT 2
Summary Table of Audit Results

AUDIT YM-ARP-96-09 DETAIL SUMMARY

PROGRAMMATIC DETAILS

QA ELEMENT/ ACTIVITIES	PROCESS STEPS/ DOCUMENTS REVIEWED	CHECKLIST DETAILS YM-ARP-96-09	CAR (5.5.1)	DR (5.5.2)	PR (5.5.3)	CDA (5.5.4)	REC (6.0)	ADE- QUACY	COM- PLIANCE	OV ALL
2.0 Quality Assurance Program	QA Oversight Activities	Page 25 of 33	N	N	N	N	5 and 6	SAT	SAT	SAT
	Personnel Conducting Work are Qualified and Trained	Page 30 of 33	N	N	N	N	N	SAT	SAT	
	Planning	Pages 2 & 7 of 33	N	N	N	N	N	SAT	SAT	
	Document Review	Pages 2, 3 & 25 of 33	N	N	N	N	N	SAT	SAT	
3.0 Design Control	Design Review	Pages 2 & 3 of 33	N	N	N	N	N	SAT	SAT	SAT

ATTACHMENT 2
Summary Table of Audit Results

QA ELEMENT/ACTIVITIES	PROCESS STEPS/DOCUMENTS REVIEWED	CHECKLIST DETAILS YM-ARP-96-09	CAR (5.5.1)	DR (5.5.2)	PR (5.5.3)	CDA (5.5.4)	REC (6.0)	ADE-QUACY	COM-PLIANCE	OVERALL
4.0/7.0 Procurement Document Control & Control of Purchased Items and Services	Procurement Document Preparation	Pages 10, 11 & 18 of 33	N	N	N	N	N	SAT	SAT	SAT
	Procurement Document Review and Approval	Pages 10, 18 & 21 of 33	N	N	N	N	N	SAT	SAT	
	Procurement Document Change	Pages 10 & 18 of 33	N	N	N	N	N	SAT	SAT	
	Procurement Planning	Pages 10 & 13 of 33	N	N	N	N	N	SAT	SAT	
	Approved Supplier	Page 14 of 33	N	N	N	N	N	SAT	SAT	
	Acceptance of Items or Services	Pages 8, 12 & 19 of 33	N	N	N	N	N	SAT	SAT	
	Certificate of Conformance	Pages 9 & 19 of 33	N	N	N	N	N	SAT	SAT	
	Receiving Inspection	Pages 8, 9, 10, 11, 12, 14, 15 & 17 of 33	N	N	N	N	#4	SAT	SAT	
	Commercial Grade Items	Pages 8, 9, 10, 11 & 12 of 33	N	N	N	N	N	SAT	SAT	

ATTACHMENT 2
Summary Table of Audit Results

QA ELEMENT/ ACTIVITIES	PROCESS STEPS/ DOCUMENTS REVIEWED	CHECKLIST DETAILS YM-ARP-96-09	CAR (5.5.1)	DR (5.5.2)	PR (5.5.3)	CDA (5.5.4)	REC (6.0)	ADE-QUACY	COM-PLIANCE	OVER-ALL
5.0 Implementing Documents	Work was Accomplished in Accordance with Implementing Documents	Pages 2, 3, 4, 5, 14, 15, 22, 23, 24, 26, 27 & 28 of 33	N	N	N	N	#2	SAT	SAT	SAT
6.0 Document Control	Documents and Changes are Reviewed	Pages 3 & 24 of 33	N	N	N	N	N	SAT	SAT	SAT
	Documents Available at Work Location	Page 27 of 33	N	N	N	N	N	SAT	SAT	
10.0 Inspection	Inspection Documentation Adequate	Pages 29 & 30 of 33	N	N	N	N	N	SAT	SAT	SAT
12.0 Control of Measuring & Test Equipment (M&TE)	M&TE Used is Identified and Controlled	Page 28 of 33	N	N	N	N	N	SAT	SAT	SAT
13.0 Handling, Storage, & Shipping	Items are Handled and Stored Adequately	Pages 15, 16 & 31 of 33	N	N	N	N	N	SAT	SAT	SAT

ATTACHMENT 2
Summary Table of Audit Results

QA ELEMENT/ ACTIVITIES	PROCESS STEPS/ DOCUMENTS REVIEWED	CHECKLIST DETAILS YM-ARP-96-09	CAR (5.5.1)	DR (5.5.2)	PR (5.5.3)	CDA (5.5.4)	REC (6.0)	ADE- QUACY	COM- PLIANCE	OVER- ALL
15.0 Noncon- formances	Nonconforming Items are Identified and Controlled	Page 31 of 33	N	N	N	N	N	SAT	SAT	SAT
16.0 Corrective Action	Conditions Adverse to Quality Identified	Page 26 of 33	N	N	N	N	N	SAT	SAT	SAT
17.0 Quality Assurance Records	Documents to be QA Records Identified	Pages 5, 6, 20, 24 & 25 of 33	N	N	N	N	1 and 3	SAT	SAT	SAT

PERFORMANCE BASED

Selected Work Process Steps	Work Process Description	Page 2 of 33	N	N	N	N	N	SAT	SAT	SAT
	Work Packages	Pages 3, 4, 32, & 33 of 33	N	N	N	N	N	SAT	SAT	
	Procurement, Order, and Receipt of Materials	Pages 8-22 of 33	N	N	N	N	N	SAT	SAT	
	Initiation and Completion of Travelers	Pages 23-29 of 33	N	N	N	N	N	SAT	SAT	
	Master Work Package Compilation and Close-Out	Pages 5-7 & 25 of 33	N	N	N	N	N	SAT	SAT	
TOTAL		33 Pages	N	N	N	N	6			SAT

LEGEND:
 CDA Corrected During the Audit

REC ... Recommendation
 N None

SAT Satisfactory