

United States Government

Department of Energy

**memorandum**Carlsbad Area Office  
Carlsbad, New Mexico 88221

DATE: March 2, 1998  
 REPLY TO: CAO:NTP:DEW 98-0625 UFC 2300  
 ATTN OF:

SUBJECT: CAO Audit Report A-98-04, Rocky Flats Environmental Technology Site (RFETS) TRU  
 Waste Characterization, Certification, and Transportation Program

TO: Joseph Legare, RFFO

The Carlsbad Area Office (CAO) conducted an audit of your Quality Assurance (QA) Program for TRU Waste Characterization, Transportation, and Certification at RFETS on February 9-13, 1998. The audit team concluded that, except for the deficiencies noted in the associated CARS, the RFETS technical and QA Programs were adequate in accordance with the QAPD, QAPP, WAC, and TRAMPAC. The audit team also concluded that the defined QA Program was being satisfactorily implemented and that, for the technical areas evaluated, the RFETS program was effective. The audit team also concluded that corrective actions for open, previously issued CAO Corrective Action Reports (CARs) had been fully completed. The twelve CARs have been closed.

As a result of this audit, six CARs were issued and one observation and six recommendations were identified. The observation requires a written response. The CARs have been transmitted to RFETS under separate letter.

If you have any questions or comments concerning this report, please contact Robert A. Stroud at (505) 234-7483.

Don Watkins  
 Manager  
 National TRU Program

Attachment



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Joseph Legare

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March 2, 1998

cc w/attachment:

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MAR 1998

U.S. DEPARTMENT OF ENERGY  
CARLSBAD AREA OFFICE

AUDIT REPORT

OF THE

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

AUDIT NUMBER A-98-04

FEBRUARY 9-13, 1998

TRU WASTE CHARACTERIZATION, CERTIFICATION, AND  
TRANSPORTATION PROGRAM



Prepared By: Samuel Vega  
Samuel Vega  
Audit Team Leader

Date: 2/27/98

Approved By: Samuel Vega For  
R. Dennis Brown  
CAO QA Manager

Date: 2/27/98

Approved By: Robert A. Stroud  
Robert A. Stroud  
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Date: 2/27/98

## 1.0 EXECUTIVE SUMMARY

Carlsbad Area Office (CAO) Audit A-97-04 was conducted to evaluate the adequacy, implementation, and effectiveness of the Rocky Flats Environmental Technology Site (RFETS) Transuranic (TRU) Waste Characterization, Transportation, and Certification Program. The audit scope also included verification of the completion and effective implementation of corrective actions for previously identified conditions adverse to quality.

The audit was conducted at the RFETS facility February 9 through 13, 1998. The audit team concluded that, except for the deficiencies noted in this report, the adequacy of the RFETS technical and Quality Assurance (QA) Programs was satisfactory in meeting the CAO Quality Assurance Program Description (QAPD); Quality Assurance Program Plan (QAPP); Waste Acceptance Criteria (WAC); and TRUPACT-II Authorized Methods for Payload Control (TRAMPAC). The audit team also concluded that the defined QA Program was being satisfactorily implemented in accordance with the RFETS Quality Assurance Project Plan (QAPjP) and implementing procedures and that, for the technical areas evaluated, the RFETS program was implemented and effective. In addition the audit team concluded that corrective actions for all twelve of the open, previously issued CAO Corrective Action Reports (CARs) have been closed.

The audit team identified twenty conditions adverse to quality resulting in the issuance of six CARs that require corrective action in the areas of transportation, procedural adequacy, training, document review and control, corrective action, and non-destructive assay (NDA). Twenty deficiencies, isolated in nature and requiring only remedial corrective actions, were corrected during the audit (CDAs). Six recommendations are being offered for management action and consideration. One observation was identified. In addition, the area of Waste Shipment was concluded to be indeterminate at this time. The audit team noted two exemplary practices being performed by RFETS personnel. CARs, CDAs, Observations, Recommendations, and Exemplary Practices are described in Section 6.0 of this report.

## 2.0 SCOPE

The audit team evaluated the adequacy, implementation, and effectiveness of technical and quality assurance processes related to the RFETS TRU Waste Characterization, Certification, and Transportation activities.

The following elements were evaluated in accordance with the CAO QAPD:

- Organization
- QA Program Implementation

- Personnel Qualification and Training
- Quality Improvement
- Documents and Records
- Work Processes
- Procurement
- Measuring and Test Equipment
- Assessments
- Sample Control
- Data Documentation, Control, and Validation
- Software Requirements
- QA Grading

The following CAO characterization technical elements were evaluated in accordance with the CAO QAPP:

- Sampling Analysis Plan
- Sampling - Head Space Gas
- Testing - NDA, RTR
- Visual Examination
- Analysis - Head Space Gas
- Data Validation, Usability, and Reporting
- Performance Demonstration Program (PDP)

The following transportation technical elements were evaluated in accordance with the CAO TRAMPAC:

- Inspection of Packaging
- Visual
- TRUPACT-II Preparation and Loading
- TRUPACT-II Leak Check
- Shipping (the process, including the Waste and Environmental Management System [WEMS] Shipping Module)
- Package Maintenance
- Documentation and Records
- Payload and Drum Certification
- Transportation Tracking and Communications (TRANSCOM)

Evaluation of RFETS TRU Waste Characterization Program (TWCP) documents was based on current revisions of the following documents:

- RFETS QAPjP for the Transuranic Waste Characterization Program, 95-QAPjP-0050

RFETS Transuranic Waste Management Manual, 3-MAN-008-WM-001  
Related RFETS technical and quality assurance implementing procedures  
Open CAO Corrective Action Reports and observations from Audits A-95-06, A-97-03, and A-98-06

### **3.0 AUDIT TEAM AND OBSERVERS**

#### **AUDITORS/TECHNICAL SPECIALISTS**

Samuel Vega	Audit Team Leader, CAO
R. Dennis Brown	CAO QA Manager
Robert Stroud	CAO NTP Certification Manager
Marlin Horseman	Auditor, CTAC
Amy Arceo	Auditor, CTAC
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Jack Walsh	Auditor, CTAC
Cooper Wayman	Auditor (in-training), CAO
Mark Doherty	Technical Specialist, CTAC
Ken Coop	Technical Specialist, CTAC
William Weston	Technical Specialist, WID
Clint Kelly	Technical Specialist, WID
John Gran	Technical Specialist, WID

#### **OBSERVERS**

Paul Detwiler	DOE-HQ
Craig Snider	CAO
Ben Walker	EEG
Bruce Foster	NTS
Steve Nolan	NTS

### **4.0 AUDIT PARTICIPANTS**

RFETS individuals involved in the audit process are identified in Attachment 1. A preaudit meeting was held at the RFETS Building 111 Auditorium on February 9, 1998. A daily meeting was held with RFETS Management and staff to discuss issues and potential deficiencies. The audit was concluded with a postaudit meeting held at the RFETS T-371C Building on February 13, 1998.

## **5.0 SUMMARY OF AUDIT RESULTS**

### **5.1 Program Adequacy, Implementation, and Effectiveness**

The audit team concluded that the adequacy of the RFETS QA Program was satisfactory in meeting the requirements of the CAO QAPD, Revision 1; the QAPP, Revision 0 and Interim Change 11/96; the WAC, Revision 5 and Change Notice 1; and the TRAMPAC, Revision 16. The audit team concluded that except for the area that were concluded to be indeterminate, the QA program was being satisfactorily implemented. For the technical areas evaluated, the RFETS program was determined to be effective. In addition the audit team evaluated the status and implementation of corrective actions completed for previous CAO CARs. All previous CARs have been closed.

### **5.2 QA Program Audit Activities**

A summary table of audit results is provided as Attachment 2. Details of audit activities, including specific objective evidence reviewed, are contained within the audit checklists. The checklists are maintained as QA records.

### **5.3 Technical Activities**

Evaluations of applicable RFETS technical activities are summarized below.

#### **5.3.1 Nondestructive Assay (NDA)**

Two NDA systems (Canberra Industries and RFETS Building 371 Passive/Active Drum Counter) were evaluated during the audit.

##### **5.3.1.1 Canberra Industries NDA**

Nondestructive assay (NDA) activities related to the Canberra Industries mobile assay systems used at the RFETS were evaluated for adequacy and satisfactory implementation. In addition the effectiveness of the processes used by RFETS for the NDA of TRU waste drums were evaluated. Canberra's instruments were not in operation during the current audit, but had been determined to be providing acceptable data during the July 1997 audit (A-97-03). The current evaluation included:

- Completion of checklist items not resolved during Audit A-97-03.
- Resolution of questions and concerns remaining after Canberra's presentation of their total measurement uncertainty method at the August 1997 meeting on this subject in Broomfield, Colorado.

The audit team concluded that the Canberra Industries NDA process was adequately documented, satisfactorily implemented, and effective for use at RFETS.

#### **5.3.1.2 Building 371 PADC**

The NDA activities for instrument calibration and assay operations for the Building 371 PADC (passive-active drum counter) were evaluated. The actual operation of the PADC instrument was not observed during the audit. The instrument had been recently re-calibrated in response to CAO CAR 96-009. The report describing this calibration contained contradictory statements and lacked the information needed to allow a complete evaluation of the acceptability of the calibration. Because the calibration had been completed, CAO CAR 96-009 has been closed. However, due to concerns relative to the manner in which the calibration was performed and other issues, CAO CAR 98-020 has been initiated.

The new calibration procedure included variants from consensus standards with regard to source positioning and characterization and the atypical nature of the analyses and presentation of the results. This configuration did not permit the auditors to assess the validity of the calibration. RFETS needs to describe how the variants used compare with more standard calibration consensus standards. RFETS also need to correct deficiencies in the documentation so that a conclusive review of the calibration can be performed. Several requirements of Section 9 of the RFETS QAPjP were missing or incorrectly described in the implementing documents for the PADC. These deficiencies are addressed in CAR 98-020. Because of the problems noted, the Building 371 PADC NDA process was determined to be ineffective.

#### **5.3.2 Data Validation; Level 2, Project Level Data Review and Reporting**

Nineteen adequacy issues were identified with procedure WIPP-010, Revision 0, "WIPP TRU Waste Characterization Project Level Data Review and Reporting". The issues were corrected and verified during the audit. Four data packages were reviewed and determined to be acceptable. The report used to calculate and identify the RTR miscertification rate was reviewed and was also acceptable. Revisions made to the procedure to address adequacy issues will ensure that project level data review continues to be correctly performed. This area has been determined to be adequate, satisfactorily implemented, and effective.

#### **5.3.3 Real-Time Radiography**

Real-Time Radiography operations were evaluated to ensure that deficiencies noted during the last audit were corrected (CAO CAR 97-100). Corrective actions had been completed and are effective (see Section 6.1.1). Operations performed since the last



audit were reviewed to ensure continued acceptable performance. Revisions to procedures 4-W30-NDT-00664, Revision 1, "Real-Time Radiography Testing of Transuranic and Low-Level Waste in Building 664" and 4-I19-NDT-00569, Revision 2, "Real-Time Radiography Testing of Transuranic and Low-Level Waste in Building 569" that were made to correct past deficiencies were determined to be adequate and satisfactorily implemented. RTR activities performed in accordance with these procedures were determined to be effective.

#### **5.3.4 Visual Examination**

Adequacy issues with the visual examination procedure, 4-H80-776-ASRF-007, Revision 1, "Visual Examination for the TRU Waste Characterization Program" were corrected with the issuance of DMR 97-DMR-001528 during the audit. The audit team noted that older individual bags in drums had not been consistently marked during previous visual examinations; however this practice has been corrected and the process has been determined to be effective. Visual examination operations were evaluated by observing surrogate waste and by reviewing videotape of previous examinations of actual waste. The ability of the operators to communicate with operators outside of the examination room is hampered because of background noise and the use of respiratory protection. These factors also degrade the quality of the audio portion of the recording. The audit team recommended and RFETS is in the process of providing radio communication between the operators inside the examination room and those outside the room (see Recommendation 5). Visual examination activities were determined to be adequate, satisfactorily implemented, and effective.

#### **5.3.5 Hydrogen and Methane Analysis**

Deficiencies (CAO CAR 97-100) in the inorganic laboratory noted during the July 1997 audit were verified to have been corrected and incorporated into laboratory operations (see Section 6.1.1). Laboratory analysis and data review activities were evaluated to ensure continued effective performance. The calculation of precision did not include the use of replicate analysis of laboratory control samples. RFETS should revise procedures (L-2421, Revision E, "Precision Gas Mass Spectrometry Operations and Analyses" and L-5016, Revision F, "Data Review and Validation of Inorganic Gas Analysis for WIPP-TWCP Data Generation Level") to include replicate analysis of LCSs and to specify a reasonable frequency. Because the QAPP does not specify the frequency for replicate analysis of laboratory control samples (LCSs), this situation has been classified as an Observation (see Observation 1). Overall, the inorganic laboratory performance was determined to be adequate, satisfactorily implemented, and effective.

### **5.3.6 Volatile Organic Compound Analysis**

Deficiencies (CAO CAR 97-100) in the volatile organics laboratory noted during the last audit were verified to have been corrected and incorporated into laboratory operations (see Section 6.1.1). Laboratory analysis and data review activities were evaluated to ensure continued effective performance. The calculation of precision did not include the use of replicate analysis of laboratory control samples. RFETS should revise procedures (L-4111, Revision I, "GC/MS Determination of Volatile Organics Waste Characterization" and L-5017, Revision G, "Data Review and Validation of Volatile Organic Compound Analysis for WIPP-TWCP Data Generation Level") to include replicate analysis of LCSs and to specify a reasonable frequency. Because the QAPP does not specify the frequency for replicate analysis of LCSs this situation is being documented as in observation (see Observation 1). Overall, the volatile organics laboratory performance was found to be adequate, satisfactorily implemented, and effective.

### **5.3.7 Performance Demonstration Program**

A review of the Performance Demonstration Program (PDP) for nondestructive assay, analysis of simulated headspace gases, and the analysis of solidified wastes was conducted to verify the continued effectiveness of the program. None of the actual PDP evaluations were observed during the conduct of a cycle due to the timing of the audit. One measure of the success of the RFETS PDP is the successful RFETS participation in the most recently conducted cycle for nondestructive assay, analysis of simulated headspace gases, and the analysis of solidified wastes. Based upon a review of the resources available, the methods practiced, the procedures followed, the instrumentation employed, and the integration of the quality assurance and technical programs, the Performance Demonstration Program was determined to be adequate, implemented, and effective.

### **5.3.8 Traveler Process**

The traveler process was reviewed to verify the linkage of this activity across organizational boundaries. Four procedures were evaluated (1-M12-WO-4032, Revision 1, "Solid Radioactive Waste Packaging Requirements"; 1-PRO-079-WGI-001, Revision 0, Waste Characterization, Generation and Packaging, 4-D99-WO-1100, Revision 2, "Solid Radioactive Waste Packaging"; and 1-C80-WO-1102-WRT, Revision 0, "Waste/Residue Traveler Instructions"). Based on the audit team's evaluation of these procedures and the related activities, it was concluded that the overall traveler process is adequate, satisfactorily implemented, and effective. This is attributable in large measure to the integrating function performed by the Customer Service Organization (see Exemplary Practice 1 in Section 6.5).

### **5.3.9 Sampling Design**

The processes used to comply with specific container selection, sampling, examination, and data analysis requirements for RCRA regulated solid waste were reviewed by the audit team. RFETS procedure WIPP-009, Revision 0, "RCRA Characterization of TRU Waste to be Disposed of at WIPP", that addresses these activities was determined to be adequate, satisfactorily implemented, and effective.

### **5.3.10 Headspace Gas**

The processes used to perform headspace gas sampling and analysis were evaluated by the audit team. The following procedures were determined to be adequate with regard to meeting the associated requirements of the CAO QAPP: 1) L-4138, Revision E, "Summa Passivated Stainless Steel Canister Cleaning and Certification"; 2) L-4146, Revision E, "Headspace Gas Sampling of Waste Containers"; 3) L-4148, Revision G, "Preparation of Samples and Calibration Standards for Determination of Gases in Sample Canisters"; 4) L-5017, Revision G, "Data Review and Validation of Volatile Organic Compound Analysis for WIPP-TWCP Data Generation Level"; 5) 4-H30-WO-5000, Revision 0, "Handling Transuranic and Transuranic Mixed Waste Packages in Building 664"; and 6) 4-S57-WP-4701, Revision 2, "Waste Characterization Gas Sampling". The audit team's review of the analytical laboratory's data packages, records, methods, practices, and instrumentation supported the determination that the procedures are adequate, being implemented, and the process is effective.

### **5.3.11 Chain-of-Custody**

The audit team reviewed sample administration records for the receipt of WIPP headspace sample canisters. This included chain-of-custody forms, sample canister information documents, canister certification reports, WIPP record transmittals and receipt forms, independent technical review forms, internal laboratory review forms, and radiological contamination survey forms. The RFETS chain-of-custody program was determined to be adequate, satisfactorily implemented, and effective.

### **5.3.12 RFETS Transportation**

The audit team evaluated the RFETS TRUPACT-II leak check and certification processes and concluded that the processes and controls are acceptable for the assembly and leak check of the TRUPACT-II in accordance with the TRUPACT-II SARP and DOE/WIPP 93-1001. The audit team observed the assembly and leak test of a TRUPACT-II training unit and determined that the operations were implemented in accordance with the approved and adequate procedure and that the process was effective.

The audit team also observed the RFETS process for certifying a payload in accordance with procedure 1-PRO-X05-WC-4018, Revision 0, "Transuranic (TRU) Waste Certification". These activities were performed by the designated alternate Waste Certification Official (WCO) and alternate Transportation Certification Official (TCO). The WCO was able to satisfactorily certify a payload container in accordance with the WIPP WAC using RFETS procedures. RFETS uses the Waste and Environmental Management System (WEMS) computer system to aid in the process of calculating and documenting the container and payload certification criteria. The WEMS process was demonstrated using data from actual RFETS TRU waste containers and the process was determined to be effective.

During the evaluation of the demonstration conducted to certify a payload in accordance with the TRAMPAC criteria for shipment in a TRUPACT-II, the audit team observed that the alternate TCO was unable to perform the activities described in Traffic Work Guide 505 as written. The alternate TCO also stated that the Traffic Department had not attempted to implement this procedure prior to the audit. Subsequent to the interview with the TCO, the audit team reviewed Traffic Work Guide 505 and determined that it did not meet the requirements of the TRUPACT-II TRAMPAC for payload certification.

The audit team concluded that because the procedure was inadequate (CAR 98-019), implementation and effectiveness could not be evaluated. Therefore, this area is considered to be indeterminate until the procedure is determined to be adequate and implemented.

### **5.3.13 Software**

Software controls were reviewed to assess the interface between the WEMS and the WIPP Waste Information System (WWIS) and the software control processes used in the radiological laboratories.

The audit team identified two concerns that were corrected during the audit (CDA). The first involved the sequence of data entry in the WEMS Shipping Module. The program required that the closure date of the TRUPACT-II Inner Containment Vessel (ICV) be entered prior to the approval of the payload selection. This sequence prevents approval of payloads prior to the actual shipping date. Software Change Request (SCR) 1293 was issued to allow approval of payloads before they are loaded into the TRUPACT-II. This change will allow the Transportation Certification Official to do advance planning and payload selection before actual shipping takes place. (See CDA 5 in Section 6.2).

The second concern involved the manual entry of data into the WEMS shipping module from such printouts as the "WEMS WWIS Certification Report" and "WEMS WWIS Characterization Reports". There is a high risk of entry error due to the format of the numerical data. This is not a concern for the electronic loading of data. These reports show data in decimal notation of up to 12 places. This format requires the individual doing manual entry to, in many instances, accurately count the number of zero digits in a long, hard to read string. The process has a high potential for human error. SCR 1292 was issued to change the format of these printouts to scientific notation; an approach more efficient to transcribe and easier to verify. (See CDA 4 in Section 6.2).

In general, the control and interface processes for these systems and software were found to be adequate, satisfactorily implemented, and effective.

## **6.0 CORRECTIVE ACTIONS/OBSERVATIONS & RECOMMENDATIONS**

### **6.1 Corrective Action Reports**

Corrective actions completed for previously initiated CAO CARs and required corrective actions initiated as a result of CAO Audit A-98-04 are briefly described below.

#### **6.1.1 Verification of Previously Initiated CAO CARs:**

##### **6.1.1.1 CAO CAR 96-009**

Corrective actions pertaining to the calibration of the Building 371 Passive/Active Drum Counter (PADC) were verified in accordance with the accepted CAR response. The PADC was recalibrated. CAR 96-009 has been closed. However, additional concerns and discrepancies relative to the calibration procedure and methodology used are included in a new CAR (98-020).

##### **6.1.1.2 CAO CAR 96-012**

Corrective actions in accordance with the accepted CAR response were verified. SCRs described verification and validation (V&V) requirements and were of sufficient depth and scope. Procedure revisions were reviewed and determined to be adequate. Configuration controls for the Oracle-based version of WEMS and the PADC software were determined to be implemented and effective. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

##### **6.1.1.3 CAO CAR 96-013**

Corrective actions in accordance with the accepted CAR response were verified. The "Software Quality Assurance Plan for the Radioactive Laboratories" was developed and issued. All Radioactive Laboratory software was reviewed, inventoried, and tracked. Software verification and validation activities have been completed. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.1.4 CAO CAR 97-085**

Corrective actions for the revision of training plans and the associated implementing procedures were verified in accordance with the accepted CAR response. The following were included in the revised plans and procedures:

- RTR and NDT training/qualification records are designated as QA records
- TWCP project training matrix revisions include training requirements for all TWCP personnel
- TWCP waste characterization program indoctrination has been developed and administered to all TWCP personnel

Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.1.5 CAO CAR 97-086**

Corrective action for the inclusion of all TWCP related positions into the TWCP Project Training Matrix contained in PLN-97-007 were verified in accordance with the accepted CAR response. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.1.6 CAO CAR 97-087**

Corrective actions, taken relative to re-instating the Records Inventory and Disposition Schedule (RIDS) process, were verified in accordance with the accepted CAR response. Ten organizational unit RIDS were reviewed and determined to be acceptable. The RIDS training was completed. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.1.7 CAO CAR 97-088**

Corrective actions for the management and retention of records were verified in accordance with the accepted CAR response. The following records were verified to be located in fire rated cabinets or the records storage vault:

- Auditor qualifications and certification records
- Laboratory procedures and document history files
- Training records
- Software QA records

The records procedure, the records matrix, the Records Inventory and Disposition Schedule (RIDS), and the associated training activities have been completed. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.1.8 CAO CAR 97-091**

Corrective actions taken to improve Software Change Request (SCR) packages were verified in accordance with the accepted CAR response. All previous errors were corrected and training on the SCR has been conducted. Three SCR packages initiated since 12/18/97 were reviewed and determined to be acceptable. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.1.9 CAO CAR 97-092**

Corrective actions taken to correct audit certifications, procedures, reports, and checklists were verified in accordance with the accepted CAR response. Procedures were revised to properly address Lead Auditor certification, audit checklists, and audit reports. An internal audit was performed in December and the audit report (as amended during the audit) was acceptable. Checklists were reviewed and were determined to be acceptable. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.1.10 CAO CAR 97-095**

Corrective actions for the assignment of hazardous waste numbers were verified to be implemented as committed to in the accepted CAR response. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.1.11 CAO CAR 97-100**

Corrective actions to revise procedures have been completed, personnel have been trained, and data packages now contain the checklists that are required for data review and validation. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.1.12 CAO CAR 98-006**

Corrective actions to maintain QA records within a suitable protected environment were verified in accordance with the accepted CAR response. Records procedures were revised to describe where and when the records were to be protected. Existing records were moved to fire-rated cabinets for protection. Based upon the acceptable objective evidence presented and reviewed, this CAR has been closed.

#### **6.1.2 CARs Initiated as a Result of CAO Audit A-98-04:**

The following six CARs, initiated as a result of Audit A-98-04, have been transmitted to RFETS under separate cover. A brief description of each CAR is provided below.

##### **6.1.2.1 CAO CAR 98-017**

Based upon a review of nine procedures, there is an implementation problem with meeting the document review and comment process requirements describe in the following procedures:

- 1-MAN-001-SDRM, Revision 0, "Site Documents Requirements Manual"
- 1-77000-DC-001, Revision 0, "Document Control Program"
- RMRS DC-06-01, Revision 0, "Document Control Program"

Specific deficiencies include improper reviews, failure to complete Document Review Sheets, incomplete signatures, failure to resolve comments, omission of dates, a lack of periodic reviews, incorrect references, a lack of Document History files, files not transmitted to Document Control, a lack of transmittal forms, and blank entries. This has been classified as a significant condition adverse to quality.

##### **6.1.2.2 CAO CAR 98-018**

Based on a sample of 102 procedures, several procedures were identified with adequacy (flowdown of requirements) issues. While many of these issues were corrected during the audit, several remain open (two on this CAR and several on other CARs). Due to corrections made during the audit, this has not been classified as a



significant condition adverse to quality, but it suggests that improvements in the procedure review process may be in order.

#### **6.1.2.3 CAO CAR 98-019**

Traffic Department personnel were unable to describe or demonstrate the task of selecting a payload and verifying that it meets the requirements and limits of the TRAMPAC, Chapter 13. They were unfamiliar with the sources of waste container characterization data to be used in the selection of waste containers and were unable to follow the process described in Traffic Work Guide 505, Revision 1, "Certifying Authorized Payloads for TRUPACT-II". In addition redundancies in responsibilities between various procedures were observed by the audit team. Suggestion for improvement have been described on the CAR. This has been classified as a significant condition adverse to quality.

#### **6.1.2.4 CAO CAR 98-020**

This CAR describes consistency, adequacy, correctness, and completeness issues relative to the recalibration of the Building 371 PADC. While the calibration had been completed (see CAR 96-009 in Section 6.1.1), a non-standard methodology was used with no justification provided. The calibration report contains incorrect and inconsistent statements. The documentation is not complete. Required algorithms are not included in the calibration report. The MDC calculation does not appear to be equivalent to the one described in the QAPP. This has been classified as a significant condition adverse to quality.

#### **6.1.2.5 CAO CAR 98-021**

The Plant Action Tracking System (PATs) process is used to track problems. Required inputs are not always provided to data entry personnel. The procedure requires that incomplete documents be returned to the originator for correction. This control has been by-passed and the term "NS" (not supplied) has been entered. This does not allow for timely or effective trending of problems. In addition the PATs output is limited in the type of reports it is able to generate (see Recommendation 3 in Section 6.4). This has been classified as a significant condition adverse to quality.

#### **6.1.2.6 CAO CAR 98-022**

WIPP-specific training is required. Nineteen instances of training not completed for seven individuals were identified. Based on this sample, corrective actions should include an investigation of other personnel that may not have completed training and

any impact on waste characterization and certification activities. This has been classified as a significant condition adverse to quality.

## **6.2 Deficiencies Corrected During the Audit (CDA)**

1. The Document History Files for Controlled Traffic procedures had not been transferred to Site Document Control and then to Records Management. During the audit these files were sent to Records Management, but not to Site Document Control (also, see CAO CAR 98-017).
2. The TRU Waste Characterization Program Indoctrination had not been completed for two RFETS personnel. The Indoctrination was completed and documented during the audit.
3. "Worksheet for Confirmation of EPA Hazardous Waste Numbers for Spent Solvents Using Headspace Gas Analytical Results" forms had blank spaces, due to confusing logic applicable to the form. The forms were corrected by entering an "N/A", as appropriate and a page change was made to clarify procedure WIPP-009 (also, see Recommendation 1 in Section 6.4).
4. Manual data entry to WEMS is performed from printouts that contain data in decimal notation up to twelve decimal places. The possibility of human error is high during manual data input. SCR 1292 was issued to change the number format to scientific notation in the reports generated and the input fields.
5. The WEMS Offsite Shipping Module does not allow for the approval of a payload until the date the ICV was sealed is entered. This sequence prevents the approval of payloads prior to the actual shipping date. Under production conditions, payloads will be selected in advance of shipping date. SCR 1293 was issued to allow approval prior to payload loading.
6. Kaiser Hill Audit Report 98-0024-KH did not identify the auditors involved with the audit. The report was amended to include the information during the audit.
7. Kaiser Hill Audit 98-0024-KH checklist questions did not identify which auditor obtained the objective evidence for each question. The checklists were updated to include this information.
8. Based upon a review of fifty-one checklist questions, Kaiser Hill Audit 98-0024-KH checklist question No. 1 was marked "Sat" and should have been "Unsat" and question No. 51 was not marked either "Sat" or "Unsat". The checklists were corrected during the audit.

9. The "Radioactive Waste Variance Logbook" had entries for variance numbers 98-03 and 98-05 but 98-04 was missing. The binder of Radioactive Waste Variance Requests, contained 98-03 and 98-04, but 98-05 was missing. Both were corrected during the audit.
10. The "Radiological Waste Variance Logbook for Building T130C" was being maintained in T130J due to a personnel move. The logbook was returned to Building T130C during the audit.
11. Based on a sample of four drums, Section IV of the traveler entitled "Trucking/Traffic" was not being completed. No signatures for the onsite transfer of containers were observed. This was corrected during the audit by issuing DMR 97-DMR-00152T to eliminate Section IV of the traveler.
12. Drum numbers were not located on the side of the container directly beneath the closure bolt, as required by procedure 4-D99-WO-110, Appendix 10, "Solid Radioactive Waste Packaging". This was corrected during the audit by issuing DMR-97-DMR-001526 to make the pictorial location non-mandatory.
13. The form memo used to issue traveler WGI GI97077-60116B was incorrect (the memo referenced WGI GI 97055 90116-RLG-063-97). The memo was corrected during the audit.
14. A listing of the "Key Custodians" responsible for the control of a waste package was neither posted in a central location within the general proximity of the waste packages nor was a listing readily accessible to all personnel working with the waste packages as required by Section 9.2.4 of procedure 1-M12-WO-4034, Revision 1, "Solid Radioactive Waste Packaging Requirements." The listing was posted and made available to personnel during the audit.
15. Nineteen adequacy issues were identified with procedure WIPP 010, Revision 0, "WIPP TRU Waste Characterization Project Level Data Review and Reporting". These were corrected during the audit.
16. Batch Report 9728 (out of four sampled) had an incomplete QA checklist. It was corrected during the audit by encircling "yes" on the form.
17. Data package GMSP-OP-00218, "Quality Control Results Summary of Inorganic Analysis by GC", Field 6 (Tag Compound Identification) was left blank by the automated system that fills out the form. This requires that the data package reviewer investigate and resolve the reason for the blank field. The form for this

data package had been signed without updating the blank field. The investigation was completed and the problem resolved during the audit.

18. The RFETS QAPjP requires that replicate assays be performed at least once per day. Implementing procedure 4-PRO-038-WO-5228, Revision 0, "Operating the Building 371 PADC" did not contain this requirement. DMR 97-DMR-001530 was issued to correct the problem during the audit.
19. Nine adequacy issues relative to procedure 4-H80-776-ASFR-007, Revision 1, "Visual Examination for the TRU Waste Characterization Program", were corrected during the audit with the issuance of DMR 97-DMR-001528.
20. The VE (visual examination) Drum Log Number was signed by a trainee working under the direct supervisor of the "visual examination expert". The expert was aware of the examination and re-signed all applicable VE Drum Log entries.

### **6.3 Observations**

The following observation requires a written RFETS response:

1. It was noted that the calculation of precision did not include the use of replicate analysis of laboratory control samples (LCSs). RFETS needs to revise procedures (L-2421, Revision E, "Precision Gas Mass Spectrometry Operations and Analyses" and L-5016, Revision F, "Data Review and Validation of Inorganic Gas Analysis for WIPP-TWCP Data Generation Level" and L-4111, Revision I, "GC/MS Determination of Volatile Organics Waste Characterization" and L-5017, Revision G, "Data Review and Validation of Volatile Organic Compound Analysis for WIPP-TWCP Data Generation Level") to include the requirement for replicate analysis of LCSs and to specify a reasonable frequency. Because the QAPP does not specify the frequency for replicate analysis of LCSs, this has been classified as an observation.

### **6.4 Recommendations**

The following six recommendations are presented for RFETS management consideration:

1. The audit team recommends revising the form entitled "Worksheet for Confirmation of EPA Hazardous Waste Numbers for Spent Solvents Using Headspace Gas Analytical Results". This form employs logic that allows blanks in certain cases. The specific blanks were properly annotated during the audit. Procedure WIPP-009, Revision 0, "RCRA Characterization of TRU Waste to be

Disposed of at WIPP" was revised with a page change on 2/13/98 to correct the issue. (also, see CDA 3 in Section 6.2).

2. RFETS procedure 3-U36-NDA-2000, Revision 0, Paragraph 6.3 [7] and [8], "Software Management for Nondestructive Assay Systems" requires that procured software be archived as both a hard copy and a disk history file. Software developed in-house only requires the archiving of a hard copy. The audit team suggests that both media be used to archive software developed in-house.
3. The audit team suggest that the PATS output be reviewed as necessary to allow sorts by the type of record (e.g., CAP Identification Forms, NCRs) and by project (e.g., TWCP, WIPP). This would enhance the utility of this database to provide meaningful management and status information.
4. In order to provide additional confidence in Canberra's total measurement uncertainty assignments, it is recommended that Canberra further study their "differential peak attenuation" method of correcting for inhomogeneous matrices. Studies should include effects due to multiple sources and potential correlations between matrix inhomogeneities and non-uniform source distributions and their impact on total uncertainty estimates.
5. The audit team recommends that visual examination operators be provided with microphones or radios to eliminate unwanted background noise and more clearly provide drum content information.
6. The audit team recommends that the certification, transportation, and project organizations combine resources to develop a process chart with specified responsibilities. The chart should describe the process from WEMS input through the certification of a payload for shipment. This will provide a communication and responsibility document that defines the necessary responsibilities and process steps and eliminates existing redundancies and confusion.

## **6.5 Exemplary Practices**

- The Customer Service Organization represents an innovative approach to facilitate seamless integration of waste generation and waste certification activities.
- The QA Grading process, approach, and documentation is particularly well-defined and well-organized.

## **7.0 LIST OF ATTACHMENTS**

Attachment 1: Personnel Contacted During the Audit

Attachment 2: Summary Table of Audit Results

**PERSONNEL CONTACTED DURING THE AUDIT**

<b>RFETS PERSONNEL CONTACTED</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PRE-AUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST AUDIT MEETING</b>
Al-hamoodah, Laura	RMRS/WIPP Records Specialist	X	X	
Allen, Bruce	NDT/Principal Engineer		X	X
Ament, Vic	DCI/Specialist		X	
Anderson, Brian	SSOC/Senior Electrician Engineer		X	
Archuleta, Larry	RMRS/Technical Supervisor		X	
Arnold, Patrick	RMRS/Customer Service Organization Manager		X	X
Ater, Ed	SAIC/DOE/RFFO/Quality Engineer	X		X
Baldwin, Chuck	RMRS/Senior Engineer		X	
Bensko, Jim	DCI/Quality Assurance			X
Bohanna, Jim	NDA/RMRS		X	
Booth, Lee	RMRS/Project Manger	X	X	
Burback, Gary	NDT/Technician		X	
Carson, Pete	SSOC/LATA/QAO	X		X
Collins, Miller	DCI/Quality Assurance Manager			X
Corbin, Denise	Source One Records/Document Control Specialist		X	
Cordova, Connie	Records Management Source One/Lead Record Storage/Turnover		X	
Cront, S. K.	K-H CP-E & I/Manager			X
D'Amico, Eric	RMRS/Environmental Scientist	X	X	X
Davis, Robert E.	K-H CP E&I/Special Projects	X		X
Davidson, Dorothy	RMRS/Dir. Govt. Services	X	X	

<b>RFETS PERSONNEL CONTACTED</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PRE-AUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST AUDIT MEETING</b>
Demonect, Jan	Kaiser Hill/Manager Oversight and Traffic Operations		X	X
Durcholz, Mary E.	RMRS/Senior Compliance Specialist		X	
Edrich, Pamela W.	RMRS/Technical Manager	X	X	X
Ellis, Sue	RMRS/Training Services			X
Ferguson, Jim	RMRS/TRU Project Technical Support	X	X	X
Ferrera, Carol	Honrne Engineering/TRU Waste Certification Official	X	X	X
Fisher, A. J.	SSOC/QA Manager		X	
Fisher, Sharon L.	SSOC/Analytical Laboratories WIPP Project File Custodian		X	
Flewelling, Art	RMRS/TRU Waste Project QA Officer	X	X	X
Franco, Johnna	NDA/RMRS/Nuclear Engineer		X	
Gates, Colins J.	RMRS/ATA/Records Specialists	X		
Goade, Dan	RMRS/SEG/TRU Waste Project Support	X	X	X
Grady, Frank	RMRS/TRU Waste Environmental Engineer	X	X	X
Griffis, Bob	RMRS/Customer Service Representative		X	
Hamann, Tom	RMRS/Records - WIPP	X		
Harns, Peggy	TSR/Manager Training Records		X	
Hernandez, Juan	RMRS/QA Manager	X	X	X
Hinkhouse, Cheryl	KH/System Specialist		X	



<b>RFETS PERSONNEL CONTACTED</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PRE-AUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST AUDIT MEETING</b>
Horton, Julianne	RMRS/Customer Service Support		X	
Hughes, Fred	RMRS/VP Operations			X
Jennings, John	SSOC/Chemist		X	
Kercher, Ann	RMRS/SEG/TRU Waste Project Technical Support	X	X	X
Kirschenmann, Harley	QA Staff Engineer		X	X
Klanecky, Michael	LATA/SSOC/Lead Assessor NCR Coordinator		X	
Kuhng, Karen	CSO/Environmental Compliance Engineer		X	
Lahoud, Russell G.	KH/KH TRU Waste	X	X	X
Legare, Joe	DOE/RFFO/Assistant Manager Environmental Compliance	X	X	X
Leifer, John	RMRS/SEC/Scientist	X		X
Lenarcic, Kenneth	DCI/Traffic Manger Transportation Certification Official	X	X	
Lewis, Leslie	RMRS/Environmental Engineer		X	X
Langois, Leslie	SSOC/Environmental Coordinator		X	
Lusk, Dan	RMRS/Training Staff		X	
Maline, Mike	DOE/AMGO/DOE Transportation			X
Manzanares, Kathleen F.	RMRS/Document Control Coordinator		X	
Mazza, Yvonne	SSOC/Chemist		X	
McGavin, Andrew M.	Source One Management/Document Control Manager		X	X
Meyers, Leslie	Dyncorp/RC&I Certifier		X	

<b>RFETS PERSONNEL CONTACTED</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PRE-AUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST AUDIT MEETING</b>
Montoya, Mary	Horne Engineering/Alternate Certification Official		X	
Morse, Joan R.	RMRS/Systems Analyst		X	X
Myers, Carla G.	SSOC/Procedure Coordinator		X	
O'Connor, Brian G.	LATA/SSOC/Laboratory QA Officer	X	X	X
O'Leary, Jerry	RMRS/TRU Waste Project Manager	X	X	X
Papworth, Russ	K-H (Tenera)/K-H Quality Audits Technical Lead	X	X	X
Patti, Marian	TSR/Administrative Specialist		X	
Pestovich, John	SSOC/Chemist		X	
Peters, Kevin J.	Wastren/Waste Systems Support		X	X
Pigeon, Paul	RMRS/Training Programs	X	X	X
Prisenal, Joseph E.	RMRS/664 Building Manager		X	
Prochazka, Mic	RMRS/QA Program		X	
Prochnow, David	Record Management Source One/Lead Records Storage/Turnover		X	
Raudobough, Donna	KH/Data		X	
Reinhart, Doug	RMRS/Training Manager		X	X
Reinke, William	SSOC/RRT		X	
Remington, Daniel	NDA/RMRS/Engineer		X	
Reynolds, Joe	LATA/SSOC/WIPP QAO	X	X	X
Roberts, Lynn	RMRS/ATAWIPP Project File	X		

<b>RFETS PERSONNEL CONTACTED</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PRE-AUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST AUDIT MEETING</b>
Rodgers, Alan	K-H/Waste and Environmental Operations Manager	X		X
Robledo, Ron	RMRS/ATA/TRU Waste Project Support		X	X
Rose, Steve	RMRS/SEG/Deputy Facility Manager		X	
Shainholtz, Jeff	Project Specialist		X	
Simmons, Bill	SSOC/Chemist		X	
Smart, Kim	K-H/IRM/Records Manager		X	X
Stoddard, Ann	Source One Document Control/Document Control Lead		X	
Tallman, Steven L.	NDT/Manager		X	X
Terrell, Frank	KH-IRM/CIO	X		
Transue, Martin	SSOC/LATA/Laboratory QA Officer (WIPPLPQAO)	X	X	X
Turner, Charles A.	SSOC/Laboratory Manager	X	X	X
Tuti, Chuck	KH/System Manager		X	
Tyler, Laura	RMRS/Senior Lead Records	X	X	X
Tyler, Reg	DOE/RFETS/Team Leader	X		X
Wander, Sandra	LANL/Waste Certification Official			X
Watkins, Jeanett L.	DCI/Transportation Senior Specialist		X	X
Watson, Doug	RMRS/Engineering Technical		X	
Weaver, Susan	RMRS/SEG/Environmental Coordinator		X	
Wheeler, Martin	RMRS/Director Waste Operations			X
Willey, James R.	SSOC/Chemist		X	

<b>RFETS PERSONNEL CONTACTED</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PRE-AUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST AUDIT MEETING</b>
<b>Williams, Linda M.</b>	<b>RMRS/Williams and Associates/PDCO</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Van Buren, Phyllis</b>	<b>Horne Engineering/Administrative Assistant</b>		<b>X</b>	
<b>Velack, Thomas</b>	<b>Senior Administrative Team Leader</b>		<b>X</b>	
<b>Yoshida, Tracy</b>	<b>RMRS/Technical Support</b>		<b>X</b>	
<b>Xuan, Lam</b>	<b>DOE/RFFO/EC/General Engineer/WIPP Interface</b>	<b>X</b>	<b>X</b>	<b>X</b>

CAO Audit A-98-05 Detail Summary

Requirements Documents	No. of Pages	Concern Classification				QA Evaluation		Technical		
		CARs	CDAs	Obs	Rec	Adequacy	Implementation	Effectiveness		
<b>QAPjP</b>										
2.1	Organization/ Management Assessment	9	98-018				A	S	E	
2.2	Document Control	25	98-018 98-017	1			M	M	M	
2.3	Training	11	98-022	2			A	M	M	
2.4	Records	12		3		1	A	S	E	
2.5	Procurement	11					A	S	E	
2.7	Software	8		4, 5		2	A	S	E	
2.8.1	Audits	12		6, 7, 8			A	S	E	
2.9	Corrective Action	23	98-018 98-021	9, 10		3	A	S	E	
2.1	Calibration/M&TE	2					A	S	E	
2.8.3	PDP	14					A	S	E	
3.0	Data Validation - Level 2	30		11, 15			A	S	E	
4.0	Acceptable Knowledge Traveler Process	32		12, 13, 14			A	S	E	
5.0	Sampling Design	5					A	S	E	
6.0	C of C	6					A	S	E	
7.0	Headspace Gas	27		16			A	S	E	
8.0	Solid Sampling	NOT AUDITED								
9.0	NDA - Canberra	11				4	A	S	E	
	NDA - 371 PADC	25	98-020	18		5	NA	U	NE	
10.0	RTR, Visual	16		19, 20			A	S	E	
11.0	H <sub>2</sub> and Methane	8		17	1		A	S	E	
12.0	VOCs	5			1		A	S	E	
13.0	Total VOCs	NOT AUDITED								
14.0	Total Semi VOC Analysis	NOT AUDITED								
15.0	Metals Analysis	NOT AUDITED								
	Transportation	22	98-019				NA	I	I	
	Verification of Open CARs	44	All 12 open CARs closed			6		A	S	E
<b>TOTALS</b>		<b>350</b>	<b>6</b>	<b>20</b>	<b>1</b>	<b>6</b>	<b>A</b>	<b>S</b>	<b>E</b>	

**Definitions**

E = Effective  
S = Satisfactory  
I = Indeterminate

M = Marginal  
N/A = Not Applicable  
U = Unsatisfactory

CAR = Corrective Action Report  
CDA = Corrected During Audit  
NE = Not Effective

Obs = Observation  
Rec = Recommendation  
A = Adequate  
NA = Not Adequate