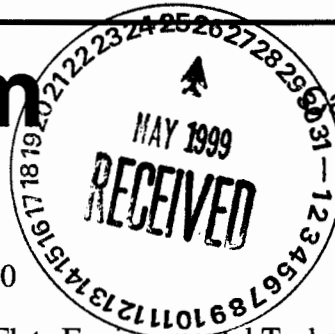


United States Government

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**Department of Energy**

# memorandum

Carlsbad Area Office  
 Carlsbad, New Mexico 88221



**DATE:** May 24, 1999

**REPLY TO**  
**ATTN OF:** CAO:QA:MAI:99-0831:UFC 2300.00

**SUBJECT:** CAO Audit Report A-99-16, Rocky Flats Environmental Technology Site (REFTS) TRU Waste Characterization of Salt Stabilization and LECO Crucible Repackaging Activities

**TO:** J. A. Legare, RFFO

The Carlsbad Area Office (CAO) conducted an audit of the Rocky Flats Environmental Technology Site (RFETS) Salt Stabilization and LECO Crucible Repackaging activities on April 27-28, 1999. The audit team concluded that RFETS procedures were being satisfactorily implemented and the evaluated processes were effective.

If you have any questions or comments concerning this report, please contact Mary E. Bennington, Waste Certification Manager at (505) 234-7482.

*Marc A. Italiano*

Marc A. Italiano  
 Quality Assurance Manager

**Attachment**

**cc:**  
 L. Xuan, RFFO  
 I. Triay, CAO  
 M. Bennington, CAO  
 L. Chism, CAO  
 M. Eagle, EPA  
 S. Zappe, NMED  
 D. Winters, DNFSB  
 T. Bowden, CTAC  
 N. Frank, CTAC  
 B. Walker, EEG  
 M. Castagneri, RFETS  
 G. O'Leary, RFETS  
 J. R. Stroble, WID

990515



U.S. DEPARTMENT OF ENERGY  
CARLSBAD AREA OFFICE

AUDIT REPORT

OF THE

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

AUDIT NUMBER A-99-16

April 27-28, 1999

TRU WASTE CHARACTERIZATION OF SALT STABILIZATION AND  
LECO CRUCIBLE REPACKAGING ACTIVITIES



Prepared by: *Charles L. Riggs*  
Charles L. Riggs  
Audit Team Leader

Date: *5/18/99*

Approved for Issue by: *Marc A. Italiano*  
Marc A. Italiano  
CAO QA Manager

Date: *5/18/99*

## **1.0 EXECUTIVE SUMMARY**

Carlsbad Area Office (CAO) Audit A-99-16 was conducted to evaluate the implementation and effectiveness of the Rocky Flats Environmental Technology Site (RFETS) transuranic (TRU) waste characterization activities associated with salt stabilization and LECO crucible repackaging.

The audit was conducted at the RFETS facility April 27-28, 1999. The audit team concluded that the defined technical programs for these activities were being implemented in accordance with the RFETS Quality Assurance Project Plan (QAPjP) and RFETS implementing procedures and that the RFETS processes were effective.

The audit team did not identify any conditions adverse to quality. Conditions identified by the EPA Inspection Team are described in Section 6.0 of this report.

## **2.0 SCOPE**

The audit team evaluated the implementation and effectiveness of technical processes related to the RFETS TRU waste characterization activities associated with the salt stabilization and LECO crucible repackaging processes.

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

- Acceptable Knowledge
- Calorimetry
- Visual Examination
- Cal/Gamma measurements
- Data Validation and Verification

At the beginning of the audit, CAO decided that the audit scope would be limited to those technical areas listed above. The QA elements had been audited during the annual recertification audit the previous month and found to be adequate and effectively implemented. The Segmented Gamma Scan is not used for salts or LECOs. The Waste Treatment/Sampling is RCRA related and will be assessed on a future audit.

The evaluation of RFETS TRU waste activities and documents was based on current revisions of the following documents:

- RFETS QAPjP for the Transuranic Waste Characterization Program, 95-QAPjP-0050
- RFETS Salt Stabilization, Building 707 Process Control Qualification Plan, RS-020-006

RFETS Transuranic Waste Management Manual, 3-MAN-008-WM-001  
Related RFETS technical and quality assurance implementing procedures

### 3.0 AUDIT/INSPECTION TEAMS AND OBSERVERS

#### AUDITORS/TECHNICAL SPECIALISTS

Samuel Vega	Audit Manager, CAO
Charlie Riggs	Audit Team Leader, CTAC
Wayne Ledford	Auditor, CTAC
Pete Rodriguez	Auditor, CTAC
Mark Doherty	Technical Specialist, CTAC
Vann Bynum	Technical Specialist, LANL

#### EPA INSPECTORS

Scott Monroe	EPA/ORIA, Team Leader
Patrick Kelly	EPA Support Contractor
Jana Lyn Dawson	EPA Support Contractor
Robert Thielke	EPA Support Contractor

#### OBSERVERS

Ben Walker	EEG
Richard Graham	EPA/Region 8
Jean Lillich	EPA/Region 8
John Goode	EPA Support Contractor

### 4.0 AUDIT PARTICIPANTS

RFETS individuals involved during the audit process are identified in Attachment 1. A preaudit meeting was held at the RFETS 111 Building on Tuesday, April 27, 1999. A meeting was held with RFETS Management and staff on Wednesday morning to discuss issues and potential deficiencies. The audit was concluded with a postaudit meeting held at the RFETS 460 Building High Bay on April 28, 1999.

### 5.0 SUMMARY OF AUDIT RESULTS

#### 5.1 Program Implementation and Effectiveness

The audit team concluded that the RFETS Program, as described in the RFETS implementing procedures for these activities, satisfactorily meets the requirements of the QAPP, Revision 0 and Interim Changes 2/96 and 11/96. The audit team concluded that the RFETS program was being satisfactorily implemented and was effective.

## **5.2 QA Program Audit Activities**

As discussed in Section 2.0, QA Program activities were removed from the scope of the audit.

## **5.3 Technical 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. Attachment 3 identifies the RFETS implementing procedures that were included in the audit.

Evaluations of RFETS technical activities pertaining to the salt stabilization and LECO crucible repackaging are summarized below.

### **5.3.1 Dry Residue Repackaging: Visual Examination**

Residue repackaging operations in Buildings 707 and 776 were observed and found to satisfactorily address program requirements for waste characterization and certification of the waste form. Actual repackaging of LECO crucibles was observed in both buildings. A can of LECO crucibles was opened, sorted, inspected for prohibited items, weighed, and repackaged. The operation was observed and documentation from previous repackaging activities was reviewed. The repackaging activities adequately meet characterization and certification requirements. This process was determined to be implemented and effective.

### **5.3.2 Calorimetry/Gamma Assay**

RFETS provided a demonstration of the calorimetry/gamma assay process. The operation of the calorimetry/gamma isotopic system was evaluated and data packages generated by the assay were reviewed. Assay results from this system are used in the calorimetry calculations. The system is operated in accordance with the applicable national consensus standard, ASTM C1030-95. The calorimetry/gamma assay process was determined to be implemented and effective.

### **5.3.3 Data Validation and Verification**

Data packages documenting radioassay of residues using the calorimetry and gamma spectrometry process were evaluated against program requirements. No deficiencies were found. Data packages documenting LECO crucible repackaging activities were evaluated. No deficiencies were found. Data packages documenting salt stabilization were evaluated. No discrepancies were found. This area was determined to be implemented and effective.

### **5.3.4 Salt Stabilization Processing**

Through a series of interviews with operators and supervisors and the review of documentation it was determined that the design of the process for pyro-oxidation stabilization of salt residues is technically sound with sufficient process controls. This area was determined to be implemented and effective.

### **5.3.5 Acceptable Knowledge (AK)**

RFETS provided a presentation on the AK process. Interviews with RFETS personnel responsible for assembling the required AK information were held. The Waste Stream Summaries for the salts and LECO crucibles were reviewed and found to contain all of the required information. This area was determined to be implemented and effective.

## **6.1 CONDITIONS NOTED BY THE EPA (Verbatim)**

### **FINDING**

“The CAO TRU QAPP Section 9.6, page 1-8, requires that radioassay reports provide, among other items, a “listing of individual isotopes present (curies) and associated uncertainty (curies).” The calorimetry/gamma assay systems we observed in B707 do not provide these data. This was not determined to have a negative impact on compliance.”

### **CAO response**

Since the CAO TRU QAPP Section 9.6, page 18, requires that radioassay reports provide, among other items, a “listing of individual isotopes present (curies) and associated uncertainties (curies).” Acceptable knowledge has been used, properly, to exclude certain radioisotopes from radioassay because they are not present in the waste. RFETS should add to the radioassay reports a reference to the AK information and a list of those radioisotopes that were excluded from radioassay.

### **Concern 1**

“The gamma system in B707 we observed uses the TRIFID software to perform several checks prior to use. Since the software is used to provide information it would be desirable for the software to be evaluated directly on a subsequent audit.”

#### CAO response

The TRIFID software will be included in a subsequent audit, since it is used to provide radioassay information.

#### Concern 2

“The calorimetry/gamma uncertainty data in the WEMS Database did not reflect the change from a 1-sigma to a confidence interval value. This change was prompted by a previous CAR and is in the process of being fully implemented.”

#### CAO response

RFETS will complete the necessary corrective action and CAO will verify to ensure that the calorimetry/gamma uncertainty data in the WEMS Database reflects the change from a 1-sigma to a confidence interval value.

#### Concern 3

“Qualified radionuclide data is entered into the WEMS database over existing radionuclide data from unqualified systems. Although, the data is subsequently reviewed in the WIPP verify process, the database does possibly present a potential source of error.”

#### CAO response

CAO agrees that RFETS should review the process for entering updated radionuclide values into WEMS as part of its periodic process improvement efforts. The CAO agrees that there is a potential source of error, but the data is subsequently reviewed in the WIPP verification process so the probability of coincident mistakes is extremely small.

**NOTE:** Per the Lead EPA Inspector, none of the conditions observed required a response from CAO, RFFO, or RFETS.

### **7.0 LIST OF ATTACHMENTS**

Attachment 1: Personnel Contacted During the Audit

Attachment 2: Summary Table of Audit Results

Attachment 3: Table of RFETS Implementing Procedures Audited

**PERSONNEL CONTACTED DURING THE AUDIT****RFETS PERSONNEL CONTACTED DURING AUDIT A-99-16**

<b>NAME</b>	<b>ORG/TITLE</b>	<b>PREAUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST-AUDIT MEETING</b>
Anderson, Scott	KH/Waste Ops; Program Manager	X		X
Ater, Ed	SAIC/RMRS; TRU Program Technical Specialist			X
Ballenger, R. J.	SSOC/WIPP; Residue Compliance Manager	X	X	X
Burger, Valerie	Lata/SSOC/NDA	X	X	X
Campbell, Georgianne	SSOC; Chemist Cal/Gamma	X	X	X
Carson, Pete	RMRS/LATA/TRU Waste; Scientist/Engineer	X	X	X
Cassel, Jon R.	DRR 776; Proc Spec		X	
Castagneri, Mark	RMRS/QA; TWCP QAO	X	X	X
Ciocchetti, Dennis	SSOC; Supervisor		X	
Cissne, D. A.	Pu Ops 707; RRT		X	
Coriden, Michael	DOE/RFFO/OCC			X
Cox, Carl	SSOC; President	X		X
D'Amico, Eric	RMRS/Waste Projects; Environmental Scientist	X		X
Davis, Robert E.	KH CP E&I/Special Projects		X	
DiSalvo, Rick	DOE/RFFO/OCC			X
Eberlein Susan	SSOC/Product Quality; Department Manager	X		
Edrich, Pamela W.	RMRS/Technical Manager	X		
Elmont, Tim	SSOC/NDA; Cal Gamma	X	X	X
Eschenbaum, R. A.	SSOC/LATA/WIPP/Residue Compliance; Senior Eng	X		X
Ferguson, Jim	RMRS/GTS/TRU Project; Engineer	X	X	X
Ferrera, Carol	Horne Engineering; TRU	X		



<b>RFETS PERSONNEL CONTACTED DURING AUDIT A-99-16</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PREAUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST-AUDIT MEETING</b>
	Waste Certification Official			
Ferrera, Ken	KH/707 Project Dir	X	X	X
Fisher, A. J.	SSOC; QA Manager	X		
Fisher, Doug	SSOC; Salt Stab/Eng	X	X	
French, David M.	Residues QA/QC; Consultant	X	X	X
Fulton, John	KH; VP Nuc Ops			X
Gardner, Gary	SAIC/SSOC	X	X	X
Getty, R. H.	LATA/Salts; Technical Support	X	X	
Gibbs, Frank	The IT Group/RFETS Residue Program; Engineer		X	
Goade, Dan	RMRS/GTS; PQAO	X	X	X
Grady, Frank	RMRS/TRU Waste Projects; TRU Project Engineer	X		
Gris, J. A. 'Art'	SSOC/Product Quality; Mgr	X		X
Grove, Kristy	SSOC/LATA/LP QAP	X	X	
Hadacek, M. W.	KH/Quality Program; Quality Analyst	X		
Harrell, Bob	RMRS/SWP; Technical Support		X	
Hatch, J. D.	RH/Salts; RRT		X	
Hillman, Dan	LATA; QA Engineer		X	
Horseman, Marlin	IT/ICF Kaiser; Consultant			X
Johnson, Micky	SSOC/Salts; Senior Principal Engineer Technical Support	X	X	X
Kangas, Mark	SSOC/WIPP Residue Compliance	X	X	X
Kercher, Ann	RMRS/TRU Waste Project; Engineer	X	X	X

<b>RFETS PERSONNEL CONTACTED DURING AUDIT A-99-16</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PREAUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST-AUDIT MEETING</b>
Kirby, William	SSOC/Product Qualification Technical Advisor	X		X
Kirschenmann, Harley	MACTEC/RMRS/TWCP; Engineer			X
Krupp, Gene	LATA/WIPP Residue Compliance; Sr. Chemical Engineer	X	X	X
Leifer, John	RMRS/GTS/Scientist	X	X	X
Malloy, Randy	LATA/Dry Repack Project; Lead	X	X	X
McLellan, Jeana	SOM; Records Liason II	X		
Nishimoto, Gregg	DOE/RFFO; Residue Lead	X		X
O'Leary, Jerry	RMRS/TRU Waste Project Manager	X		X
Peters, Kevin	Wastren/RMRS/Waste Systems Support			X
Pigeon, Paul	RMRS/Training Programs; TWCP Training Officer	X		
Polston, Steve	KH; Exec. VP & COO	X		
Pope, Duronda	SSOC Labs		X	
Rampe, John	DOE/RFFO; Dep AM E&I	X		
Reynolds, Joe	LATA/SSOC; LPQAO Metals		X	
Rivera, Mike	LATA/SSOC/WIPP Residue Compliance; Engineer	X		X
Robbins, Elver	DOE/RFFO/QPD; Quality Engineer	X		X
Rodgers, Gail	LATA/SSOC/Dry Residue Repack; Tech Support/Doc	X	X	X
Sendelweck, Vivian	SSOC/WIPP Residue Compliance; Engineer	X	X	X
Sheppard, Frank	DOE/HQ; General Engineer			X

<b>RFETS PERSONNEL CONTACTED DURING AUDIT A-99-16</b>				
<b>NAME</b>	<b>ORG/TITLE</b>	<b>PREAUDIT MEETING</b>	<b>CONTACTED DURING AUDIT</b>	<b>POST-AUDIT MEETING</b>
Smith, L. C.	KH/Quality Program Mgr	X		X
Stewart, Dan	SSOC/Salt; QAE	X	X	X
Swartz, J. Mike	SSOC/Dry Repack 707 Project; Lead	X		
Thomason, Gail	SSOC/LATA/Aspen/Dry Residue	X	X	
Thorualdson, Bill	LATA/Dry Repack 776; Support Eng	X	X	
Tomlinson, Phillip	Informatics/SSOC/Product Quality; Data V&V Lead	X	X	
Tressell, John	RMRS/QA; QA Eng.	X		X
Weadock, Tony	DOE EH; EH Resident	X		
Williams, Linda M.	RMRS/Williams and Associates/PDCO	X		
Wolfe, Mike	SOM; Records Liaison II			X
Xuan, Lam	DOE/RFFO/EC/General Engineer/WIPP Interface	X	X	X
Younger, Arlene	Residues QA Engineer	X		X
Zurey, Frank	SSOC/NDA; Manager	X		X

CAO Audit A-99-16 Detail Summary

Documents	Concern Classification					Technical
	CARs	CDAs	Obs	Rec	Implementation	Effectiveness
<b>Activity</b>						
Data Validation and Verification					S	E
Acceptable Knowledge					S	E
NDA-Cal/gamma					S	E
Visual Examination					S	E
Calorimetry					S	E
TOTALS	0	0	0	0	S	E

**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

**RFETS PROCEDURES AUDITED FOR A-99-16**

No.	Procedure Number	Title
1	PRO-J23--FO-0133, R2	Drum and Box Repack
2	4-W84-RS-0114, R2, DC-01, through DC-07	Salt Residue Stabilization, Bldg 707
3	L-3007-E	Calorimetry/Gamma Ray Assay Calculation and Reporting of Results
4	L-4209-E	Calorimeter Procedure Using the Antech Airbath System in the Building 707 Cal/Gamma Laboratory
5	WIPP-003, R3	Collection, Review, and Confirmation of Acceptable Knowledge Documentation
6	L-4193-G	Gamma-Ray Isotopic Analysis of Pu-bearing Solids in the Building 707 Cal/Gamma Laboratory
7	PRO-232-DRR-776, R1, DC6	Dry Residue Repackaging
8	WIPP-010, R3	WIPP TRU Waste Characterization Project Level Data Review and Reporting
9	L-4034-E	Data Review and Validation for Calorimetric Assay for WIPP TRU Waste Characterization Program
10	4-PRO-156-RS-0137, R2, Chg 1	Data Review and Validation of Salt Residue Stabilization Sampling Batch Report
11	PRO-264-RS-0141, R1. DC-1	Data Review and Verification of Salt Residue Stabilization Sampling Batch Report