DATE: July 12, 2001
REPLY TO ATTN OF: CBFO:QA:SAV:VW:01-1169:UFC:2300
SUBJECT: CBFO Recertification Audit Report A-01-03 of the Hanford Site

TO: Todd Shrader, RL

The Carlsbad Field Office (CBFO) conducted an audit of the Hanford Site waste characterization, certification, and transportation activities during June 11-15, 2001. The audit team concluded that the Hanford Site technical and QA programs were adequate in accordance with the CBFO QAPD and WIPP Hazardous Waste Facility Permit. The audit team also concluded that Hanford procedures were being satisfactorily implemented and that the evaluated processes were effective. The CBFO audit report is attached.

There was one CBFO corrective action report (CAR) issued as a result of the audit. The CAR has been forwarded to you under separate cover. Five Observations and four Recommendations were also identified during the audit.

If you have any questions or comments concerning this report, please contact me at (505) 234-7423.

Attachment

cc: w/attachment
K. Watson, CBFO
L. Chism, CBFO
E. Bilson, RL
P. Crane, FH
J. Maupin, FH
D. Winters, DNFSB
S. Monroe, EPA
M. Eagle, EPA
S. Zappe, NMED
B. Walker, EEG
M. Gerle, WTS
T. Bowden, CTAC

Samuel A. Vega
Quality Assurance Manager
U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

AUDIT REPORT

OF THE

HANFORD SITE

RICHLAND, WASHINGTON

AUDIT NUMBER A-01-03

JUNE 11-15, 2001

TRU WASTE CHARACTERIZATION, CERTIFICATION, AND TRANSPORTATION

Prepared By: Steven D. Calvert
Audit Team Leader

Date: 7/9/01

Approved By: Samuel A. Vega
CBFO QA Manager

Date: 7/11/01
1.0 EXECUTIVE SUMMARY

Carlsbad Field Office (CBFO) Audit A-01-03 was conducted to evaluate the continued adequacy, implementation, and effectiveness of the Hanford Site transuranic (TRU) waste characterization, transportation, and certification activities. The audit was conducted to evaluate summary category group S5000 retrievably stored, contact handled, debris waste.

The audit was conducted at the Hanford Site during the week of June 11-15, 2001. The audit team concluded that the Hanford technical and quality assurance (QA) procedures continue to be adequate relative to the flow down of requirements from the CBFO Quality Assurance Program Document (QAPD), the Waste Analysis Plan (WAP) of the Hazardous Waste Facility Permit (HWFP), Waste Acceptance Criteria (WAC), and the TRUPACT-II Authorized Methods for Payload Control (TRAMPAC).

The audit team concluded that the Hanford QA program continues to satisfactorily meet the requirements of the QAPD, WAP, WAC, and TRAMPAC. The audit team also concluded that the QA program is being satisfactorily implemented and, except for the areas noted in this report, that the Hanford technical processes evaluated are satisfactorily implemented and effective.

The audit team identified one condition adverse to quality that resulted in the issuance of (1) CBFO corrective action report (CAR), which requires corrective action in the area of nondestructive assay. Five isolated deficiencies requiring only remedial corrective actions were corrected during the audit (CDA). Five Observations were identified, and Four Recommendations are being offered for Hanford management's consideration. The CAR, CDAs, Observations, and Recommendations are described in section 6.0.

2.0 SCOPE

The audit team evaluated the continued adequacy, implementation, and effectiveness of technical and QA processes related to Hanford TRU waste characterization, certification, and transportation activities.

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

- Organization
- QA Program Implementation
- Personnel Qualification and Training
- Document Control
- Records Management
- Nonconformance Control
- Corrective Action
- Procurement
Measuring and Test Equipment
Assessments/Audits
Sample Control
Software Control
QA Grading
Performance Demonstration Program (PDP)

The following CBFO technical characterization elements were evaluated in accordance with the WAP and/or WAC:

Sampling Design
Sample Handling
Headspace Gas Sampling and Analysis
Nondestructive Assay (NDA)
Real-Time Radiography (RTR)
Visual Examination (VE)
Acceptable Knowledge (AK)
Data Validation, Usability, and Reporting
WIPP Waste Information System (WWIS)

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

Inspection of Packaging
Visual Inspection
TRUPACT-II Preparation and Loading
TRUPACT-II Leak Check
Shipping Preparation
Package Maintenance
Documentation and Records
Payload and Drum Certification
Transportation Tracking and Communications (TRANSCOM)

Evaluation of Hanford TRU Waste Characterization Program documents was based on current revisions of the following documents:

Hanford Site Quality Assurance Project Plan (QAPjP) for the Transuranic Waste Characterization Program
Hanford Site Transuranic Waste Certification Plan
Related Hanford technical and QA implementing procedures
3.0 AUDIT TEAM, INSPECTORS, AND OBSERVERS

AUDITORS/TECHNICAL SPECIALISTS

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
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<tbody>
<tr>
<td>Samuel Vega</td>
<td>CBFO QA Manager</td>
</tr>
<tr>
<td>Steven Calvert</td>
<td>Audit Team Leader, CTAC</td>
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<tr>
<td>Pete Rodriguez</td>
<td>Auditor, CTAC</td>
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<td>Steve Davis</td>
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<td>Amy Arceo</td>
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<td>Charlie Riggs</td>
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<td>Dick Blauvelt</td>
<td>Technical Specialist, CTAC</td>
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<td>Ken Coop</td>
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<td>Karen Gaydosh</td>
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<td>BJ Verret</td>
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<td>Tom Ward</td>
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OBSERVERS/INSPECTORS

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<tr>
<td>Mike Eagle</td>
<td>EPA Inspector</td>
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<td>Rajani Joglekar</td>
<td>EPA Inspector</td>
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<tr>
<td>Dave Stuenkel</td>
<td>EPA/Trinity Engineering Inspector</td>
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<tr>
<td>June Dreith</td>
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<td>Bob Thielke</td>
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<td>Steve Holmes</td>
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<tr>
<td>James Channell</td>
<td>EEG Observer</td>
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<tr>
<td>Robert Davis</td>
<td>DOE-ID Observer</td>
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</tbody>
</table>
4.0 AUDIT PARTICIPANTS

Hanford individuals involved in the audit process are identified in Attachment 1. A preaudit meeting was held at the 2420 Stevens Dr. Building, Conference Room 153, on June 11, 2001. A daily meeting was held with Hanford management and staff to discuss issues and potential deficiencies. The audit was concluded with a postaudit meeting held in Conference Room 153 of the 2420 Stevens Dr. Building on June 15, 2001.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

The audit team concluded that the Hanford QA program continues to satisfactorily meet the requirements of the CAO QAPD, revision 3; the WIPP WAP, effective date November 27, 1999; the WAC, revision 7; and the TRAMPAC, revision 18. The audit team also concluded that the QA program was still being satisfactorily implemented. The Hanford technical processes evaluated by the audit team were determined to remain satisfactorily implemented and effective except in the areas noted in this report.

5.2 QA Program Audit Activities

Details of audit activities, including specific objective evidence reviewed, are contained in the audit checklists, which are maintained as QA records. The quality assurance program procedures evaluated during this audit are provided in Attachment 2.

5.3 Technical Activities

Evaluations of applicable Hanford technical activities are summarized below. Technical procedures evaluated during the audit are provided in Attachment 2.

5.3.1 Nondestructive Assay

The audit team evaluated procedures and activities associated with the gamma energy assay (GEA-A) and reviewed analyses and the reporting of data and NDA results. The audit team observed the operation of the instrument. A concern relating to the quantification and documentation of U234 was identified during this audit (CAR 01-044). An issue was identified that errors had occurred in a document during the review of documentation. The issue was determined to be an isolated case and was corrected during the audit (CDA 1). A recommendation was offered to perform additional measurements/calibrations to verify the effect of the GEA-A collimators on precision and accuracy (Recommendation 1) The audit team concluded that the written program was adequate. The audit team also concluded that the NDA process was satisfactorily implemented and effective.
5.3.2 Data Generation and Data Verification and Validation

Evaluations of batch data reports from nondestructive examination (NDE), NDA, and headspace gas processes were performed to verify implementation of procedural requirements. The audit team determined that procedures for data generation had incorporated upper-tier requirements and were adequate and that the current process for data generation was satisfactorily implemented and effective.

The audit team evaluated project level verification and validation activities by reviewing data packages from the NDE, NDA, and headspace gas processes. They determined that procedures for project level data verification and validation had incorporated upper-tier requirements. The audit team concluded that the procedures for data verification and validation were adequate and that the current process for data verification and validation was satisfactorily implemented and effective.

5.3.3 Real-Time Radiography

The audit team evaluated procedures and activities associated with the RTR system and reviewed analyses and the reporting of data and RTR results. The audit team observed actual RTR operations and reviewed videotapes of containers that had previously been processed. The audit team identified two issues relating to the identification of a pressurized container and the training of the RTR operators (Observations 1 and 2). A recommendation was offered to cross reference the independent technical review checklist when changes are made to data based on the review (Recommendation 2). The audit team determined that the RTR procedures are adequate and that the RTR process was satisfactorily implemented and effective.

5.3.4 Visual Examination

The audit team evaluated procedures and activities associated with the VE system and reviewed analyses and the reporting of data and VE results. The audit team reviewed audio/video tapes of the VE process. A recommendation was offered to better describe the role of the Visual Examination Expert's role when providing direction to the technicians (Recommendation 3). They determined that the VE procedures are adequate and that the VE process was satisfactorily implemented and effective.

5.3.5 Sample Handling and Chain-of-Custody

Activities for sample handling and chain-of-custody were evaluated by observing the process steps and examining related documentation. The audit team concluded that the procedure for sample handling and chain-of-custody was adequate and that the
sample handling and chain-of-custody processes were satisfactorily implemented and effective.

5.3.6 Headspace Gas Sampling and Analysis

The audit team evaluated headspace gas sampling and analysis activities by reviewing procedures and witnessing the sampling process. The audit identified an issue relating to the inclusion of historical data being added to the Waste Container Management Travelers (Observation 3). The audit team also identified an issue with procedure DO-080-009, *Obtain Headspace Gas Samples of TRU Waste Containers*. The procedure was corrected during the audit (CDA 2). They determined that procedures for headspace gas sampling and analysis incorporated the upper-tier requirements. The audit team concluded that the procedures for headspace gas sampling and analysis were adequate and that the processes for headspace gas sampling and analysis were satisfactorily implemented and effective.

5.3.7 Transportation

The transportation program was evaluated by reviewing Shipment Data Packages, Waste Container Description Data Sheets, and the applicable procedures. The documentation reviewed was generated during previous Hanford shipment activities. The audit team reviewed associated documentation that supports the maintenance control and measuring and test equipment activities related to the transportation process. The audit team reviewed training and qualification records for personnel performing TRUPACT II Operations and TRANSCOM. An example of a mixed waste shipping package was reviewed to assure that the Uniform Hazardous Waste Manifesting process could be implemented by Hanford personnel. The audit team concluded that the transportation procedures were adequate and the process was satisfactorily implemented and effective.

5.3.8 Software

The audit team evaluated the software QA program to the requirements of the Hanford Site procedures for software development and configuration management. The evaluation included a review of the development and control of the GEA-A and segmented gamma assay system (SGSAS) software baselines and the use of spreadsheet software routines. The lifecycle documentation reviewed for the vendor-acquired GEA and SGSAS systems included the software evaluation, software requirements, software verification and validation planning, implementation, test reports and software problem reports and change requests (PR/CR). The spreadsheets included the TRU program software inventory for organic chemistry Waste Sampling and Characterization Facility and the calculation of assay results. An observation was identified in the area of software change control (Observation 4). An issue was also
identified relating to the Waste Receiving and Processing (WRAP) Baseline Software List. The issue was determined to be isolated and was corrected during the audit (CDA 3). The written software procedures are adequate and the software QA process is satisfactorily implemented and effective.

5.3.9 WIPP Waste Information System

Hanford input to the WWIS process was demonstrated for the audit team and applicable documentation was reviewed. The team verified that access control had been established and that Hanford has the ability to input correct data into the WWIS. The evaluation included a demonstration of the electronic data transfer to the WWIS. It was proved during the demonstration that data could be transferred to the WIPP site. The audit team concluded that the procedure for WWIS is adequate and that, for the part of the WWIS reviewed, the process has been satisfactorily implemented and is effective.

5.3.10 Acceptable Knowledge

The AK process was evaluated by reviewing the summary documents, references, and other applicable documentation. It was determined that the AK procedure had captured the upper-tier requirements. The activities associated with data reconciliation were also reviewed and found to be satisfactorily implemented and effective. The audit team concluded overall that the program for AK and data reconciliation was adequate and that the implementation and effectiveness of AK activities are satisfactory.

6.0 CAR, CDA, OBSERVATIONS, AND RECOMMENDATIONS

6.1 CARs

6.1.1 CARs Initiated as a Result of CBFO Audit A-01-03

The following CAR, initiated as a result of Audit A-01-03, has been transmitted to Hanford under separate cover. A brief description of the CAR is provided below.

6.1.1.1 CBFO CAR 01-044

DOE/WIPP-069, Revision 7, Section 3.3.1 requires that TRU waste generators report values for $^{234}U$. The Hanford TRU waste program does not currently quantify and report values for $^{234}U$. 
6.2 Deficiencies Corrected During the Audit

Five deficiencies, requiring remedial action only, were identified during the audit. All were corrected before the completion of the audit.

1. HNF-4051, Quality Assurance Objectives for Nondestructive Assay at the Waste Receiving and Processing Facility, Table 3 contained errors related to Quality Assurance Objectives. The document contained the correct information in other sections of the report. The errors were corrected prior to the end of the Audit QAPD section 1.4.2.1 requires documents to be correct.

2. DO-080-009, obtain headspace gas samples of TRU Waste Containers Section 6.1.7 indicates that the traveler and AK are used to verify drum liners have been vented. RTR/VE are actually used to make this determination, and a procedure change was completed to reflect the correct information.

3. The WRAP Baseline Software List indicates basic hardware type only in the Software/Hardware Configuration line item. Identification of specific hardware platforms, running the same software version are not included. A change to the WRAP Base line Software List was completed to reflect the correct information.

4. Copy of closed NCR TRU-WRP-01NCR-017, and copies of Deficiency Evaluation forms (DEFs) for NCRs TRU-WRP-01NCR-055 and 057 not in file. Copies of the documents were placed on file prior to the end of the audit. No other instances of missing NCRs or DEFs were found.

5. Corrective Action Report TRU-WSCF-00CAR-108 closure documentation needed clarification. NCR closure documentation incomplete, A memo was added to the file explaining the closure actions.

6.3 Observations

Observations are issues that could result in compliance concerns if action is not taken. The following five Observations were identified during the audit:

1. AK information was used as confirmation of RTR for a potential pressurized container. RTR could not confirm if the container had been vented. Review of the AK documentation confirmed that the container had been vented. The method for making these type of determinations needs to be better defined and results documented in concise manner.

2. Training for RTR operators lapsed. An internal CAR was written and training was performed. The operators passed the re-qualification tests. The corrective action
should include a review of data generated during the time frame the operators training lapsed.

3. Several Waste Container Management Travelers did not point to the previous historical NDA data summary information. The travelers have been corrected, however this issue indicates an inattention to detail and could lead to other compliance related issues.

4. The Software Control Board reviewed a proposed software change to a report format. The report contained a typo for the extension of a file name and should have been corrected. The typo was corrected during the audit. All other references in the report contained the correct file extension. Typos in software codes should be corrected in all cases.

5. Audit records file is missing documents required to be maintained by the Hanford procedure, WMP-400, Section 3.2.1. The missing documents are not TRU program QA records, however failure to follow procedure requirements will lead to areas of noncompliance in the program.

6.4 Recommendations

The following Four Recommendations are presented for Hanford management’s consideration:

1. Recommend that additional measurements/calculations be made to verify the effect of the GEA collimators on precision and accuracy in non-interfering mock waste matrices with a range of Pu loadings for which these collimators might be used in real waste assays.

2. Recommend that when discrepancies are identified during the Independent Technical Review (ITR) and changes are made to the data that reference back to the ITR checklist be entered with the change to establish the reason for the changes.

3. Visual examination tapes do not show the role of the Visual Examination Expert (VEE) when providing direction during the process. Recommend that the narrator state what direction the VEE is providing.

4. Recommend that the six month trending period be extended to one year because more data is available.
7.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit
Attachment 2: Table of Procedures Audited
### Personal Contacted During the Audit

#### Hanford Personnel Contacted

<table>
<thead>
<tr>
<th>NAME</th>
<th>ORG/TITLE</th>
<th>PreAudit Meeting</th>
<th>Contacted During Audit</th>
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<td>Ailes, Sid</td>
<td>Duratek Consultant</td>
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