DATE: MAY 11 2017
REPLY TO ATTN OF: CBFO:OQA:MPN:BA:17-1175:UFC 2300.00
SUBJECT: Interim Audit Report A-17-21, ORNL/CCP TRU Waste Characterization Activities

TO: Mr. William G. McMillan, DOE-OR


The audit team concluded that, overall, the ORNL/CCP programs evaluated are adequate relative to the flow-down of requirements, and the technical activities evaluated are satisfactorily implemented and effective in all areas, with the exceptions documented in the audit report.

The acceptable knowledge (AK) process implementation of enhanced AK, as specified in DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, Rev. 8, was evaluated by the audit team. CBFO has not provided the required Basis of Knowledge (BoK) document specifying when waste with oxidizing chemicals is acceptable; therefore, it was not available for evaluation during the audit. Until all enhanced AK requirements are implemented, the AK process will be deemed indeterminate. Further, batch data reports and field activities were not evaluated during this audit for Summary Category Group (SCG) S3000 solids waste due to inactivity for this SCG.

Two CBFO corrective action reports were issued as a result of this audit. Additionally, the audit team identified two observations and offered two recommendations for management consideration.

If you have any questions or comments concerning the interim audit report, please contact me at (575) 234-7483.

[Signature]
Martin P. Navarrête
Senior Quality Assurance Specialist

Attachment
cc: w/attachment

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F. Sharif, NWP  ED
M. Ramirez, NWP  ED
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A.J. Fisher, NWP  ED
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C. Simmons, NWP  ED
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CBFO QA File  ED
CBFO M&RC  ED

*ED denotes electronic distribution
U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

INTERIM AUDIT REPORT

OF THE

OAK RIDGE NATIONAL LABORATORY
CENTRAL CHARACTERIZATION PROGRAM

FOR

TRU WASTE CHARACTERIZATION ACTIVITIES
AT
OAK RIDGE, TENNESSEE
and CARLSBAD, NEW MEXICO

AUDIT NUMBER A-17-21

APRIL 18 – 20, 2017

Prepared by: Katie D. Chester
Katie D. Chester, CTAC Audit Team Leader

Date: May 4, 2017

Approved by: Michael R. Brown
Michael R. Brown, Director
CBFO Office of Quality Assurance

Date: 5-11-17
1.0 EXECUTIVE SUMMARY

U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) Recertification Audit A-17-21 was performed to evaluate the continued adequacy, implementation, and effectiveness of established programs for transuranic (TRU) waste characterization activities performed for the Oak Ridge National Laboratory (ORNL) by the Nuclear Waste Partnership LLC (NWP) Central Characterization Program (CCP). The audit team evaluated the programs, procedures, and processes for characterizing contact-handled (CH) Summary Category Groups (SCGs) S3000 solids, S4000 soils/gravel, and S5000 debris wastes, and remote-handled (RH) SCG S5000 debris waste. The audit was conducted relative to the requirements of the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), the CBFO Quality Assurance Program Document (QAPD), the Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WAC), the Remote-Handled TRU Waste Characterization Program Implementation Plan (WCPIP), and the Waste Isolation Pilot Plant Documented Safety Analysis (DSA), Chapter 18.

Audit activities were conducted at the ORNL TRU Waste Processing Center (TWPC) facilities in Oak Ridge, Tennessee, and at the Skeen-Whitlock Building in Carlsbad, New Mexico, April 18 – 20, 2017. Overall, the audit team concluded that the ORNL/CCP technical and quality assurance (QA) programs evaluated were adequately established for compliance with applicable upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. CBFO has not provided the required Basis of Knowledge (BOK) document specifying when waste with oxidizing chemicals is acceptable; therefore, it was not available for evaluation during the audit. Until all enhanced Acceptable Knowledge (AK) requirements are implemented, the AK process at ORNL will be deemed indeterminate. Further, batch data reports (BDRs) and field activities for characterizing S3000 solids waste were not evaluated during this audit due to inactivity for this SCG.

The audit team identified six concerns during the audit. One concern related to use of an obsolete procedure attachment to perform work, and another concern related to a non-editorial change being made to a BDR without receiving the same level of review and approval as the original record. These concerns resulted in the issuance of CBFO Corrective Action Reports (CARs) 17-031 and 17-032, respectively (see section 6.1). Two concerns were identified in the areas of AK and personnel qualification and training, resulting in two Observations (see section 6.3). Further, two concerns identified in the area of AK were offered to management as Recommendations (see section 6.4).

2.0 SCOPE AND PURPOSE

2.1 Scope

The scope of the audit included evaluations for the continued adequacy, implementation, and effectiveness of the technical and QA activities performed by
NWP/CCP at ORNL for characterization of CH and RH SCG S5000 debris wastes, CH SCG S3000 solids waste, and CH SCG S4000 soils/gravel waste. Transportation evaluations were limited to the area of Flammable Gas Analysis (FGA), since that was the only transportation-related activity being performed. The audit team also verified that a technical review of the generator site’s processes had been performed and that any issues identified during the technical review were resolved per DOE/WIPP-16-3564, Generator Site Technical Review Procedure. The following areas were evaluated:

**General Activities**
- Results of Previous Audits
- Changes in Programs or Operations
- New Programs or Activities Being Implemented
- Changes in Key Personnel

**Quality Assurance Activities**
- Nonconformances
- Personnel Qualification and Training
- Measuring and Test Equipment (M&TE)
- Software Version Installation
- Records

**Technical Activities**
- Acceptable Knowledge (AK) (including waste certification)
- Project-Level Data Validation and Verification (PL/V&V)
- Real-time Radiography (RTR)
- Visual Examination (VE)
- Nondestructive Assay (NDA), including Performance Demonstration Program (PDP)
- Radiological Characterization (Dose-to-Curie [DTC])
- Container Management
- Flammable Gas Analysis (FGA)
- WIPP Waste Information System (WWIS)/Waste Data System (WDS)

The evaluation of the adequacy of ORNL/CCP documents was based on current versions of the following documents:

Waste Isolation Pilot Plant Hazardous Waste Facility Permit NM4890139088-TSDF

*Quality Assurance Program Document* (QAPD), DOE/CBFO-94-1012

*Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WAC)*, DOE/WIPP-02-3122

*Remote-Handled TRU Waste Characterization Program Implementation Plan (WCPIP)*, DOE/WIPP-02-3214
Programmatic and technical checklists were developed from current versions of the following documents:

- **CCP Transuranic Waste Characterization Quality Assurance Project Plan (QAPjP), CCP-PO-001**
- **CCP Transuranic Waste Certification Plan, CCP-PO-002**
- **CCP/TRU Waste Processing Center/Oak Ridge National Laboratory Interface Document, CCP-PO-027**
- **CCP Interface Document Preparation, CCP-PO-043**

Related CCP QA and technical implementing procedures

### 2.2 Purpose

Audit A-17-21 was conducted to determine the degree of adequacy and effective implementation of program requirements for the characterization and certification of CH and RH SCG S5000 debris wastes, CH SCG S3000 solids waste, and CH SCG S4000 soils/gravel waste at the ORNL.

### 3.0 AUDIT TEAM, MANAGEMENT REPRESENTATIVES, AND OBSERVERS

**AUDITORS / TECHNICAL SPECIALISTS / MANAGEMENT REPRESENTATIVE**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
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<td>Ricardo Chavez</td>
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<td>Technical Specialist-in-Training, CTAC</td>
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4.0 AUDIT PARTICIPANTS

The ORNL/CCP individuals involved in the audit process are identified in Attachment 1. A pre-audit meeting was held on April 18, 2017, at the TWPC in Oak Ridge, Tennessee, and at the Skeen-Whitlock Building in Carlsbad, New Mexico. Daily management briefings were held to update ORNL/CCP management and staff on audit progress and identified concerns. A post-audit meeting was held on April 20, 2017, at the TWPC in Oak Ridge, Tennessee, and at the Skeen-Whitlock Building in Carlsbad, New Mexico.

Attachment 2 contains a summary table of audit results. Attachment 3 contains a list of ORNL/CCP documents audited. Attachment 4 contains the list of processes and equipment evaluated during the audit. Audit activities, including objective evidence reviewed, are described below.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

This audit was performed to assess the capability of ORNL/CCP to characterize CH and RH SCG S5000 debris wastes, CH SCG S3000 solids waste, and CH SCG S4000 soils/gravel waste for compliance with the requirements specified in the WIPP HWFP Waste Analysis Plan (WAP), the WIPP WAC, Chapter 18 of the DSA, the CBFO QAPD, and the RH TRU WCPIP. The characterization methods assessed were AK, VE, RTR, NDA (including PDP), and DTC. Other areas evaluated were data generation and PL/V&V, WWIS/WDS data entry, FGA, data quality objective (DQO) reconciliation, container management, and the preparation of Waste Stream Profile Forms (WSPFs).

The audit team concluded that, based on personnel interviews, observations of operations, and review of associated documentation and records, the ORNL/CCP TRU waste characterization program and activities for characterizing CH and RH SCG S5000 debris wastes, and CH SCG S4000 soils/gravel waste are adequately established, satisfactorily implemented, and effective in achieving the desired results. The audit team did not evaluate BDRs and field activities for characterizing CH SGC S3000 solids waste during this audit due to inactivity for this SCG.

5.2 General Activities

5.2.1 Results of Previous Audits

The audit team examined the results of the previous CBFO audit of the ORNL/CCP (A-16-15), wherein two conditions adverse to quality (CAQs) were identified. One CAQ
resulted in the initiation of CAR 16-035, related to a departure from a requirement to apply a tamper indicating device (TID) to a container when access to the container is uncontrolled. The other CAQ was identified in the area of PL/V&V, resulting in one minor isolated deficiency that was corrected during the audit (CDA). During the performance of this audit, the audit team did not observe any instances similar to the CAQs identified during Audit A-16-15, suggesting that the corrective actions taken were adequate in precluding recurrence.

5.2.2 Changes in Programs or Operations

There were no significant changes in the programs or operations at the ORNL TWPC since the previous recertification audit.

5.2.3 New Programs or Activities Being Implemented

In response to the breached drum event at the WIPP in February 2014, the DOE and NWP are strengthening their programs to provide more oversight of TRU waste generator site processing/treatment activities being applied to active waste streams prior to waste being transferred to CCP for characterization, certification, and shipment. A Generator Site Technical Review (GSTR) of ORNL was performed by CBFO since the last recertification audit, see section 5.2.5 for additional details.

5.2.4 Changes in Key Personnel

Changes in key personnel include a new CCP RH Manager, a new ORNL/CCP Project Manager who is also performing duties as Vendor Project Manager (VPM), a new CCP RH Site Project Manager (SPM), and a new CCP CH SPM.

5.2.5 Generator Site Technical Review

CBFO and NWP, as WIPP HWFP co-permittees, performed GSTR OR-1-16-01, September 19 – 23, 2016. The review was conducted at ORNL TWPC, the Radiochemical Engineering Development Center (REDC), URS CH2M Oak Ridge (UCOR), and Nuclear Fuel Services (NFS).

The GSTR team identified ten issues during their review. ORNL has satisfactorily addressed and resolved all of the identified issues and a closure letter was issued by CBFO on April 12, 2017.

5.2.6 ORNL/CCP Program Interface

The audit team evaluated the program interface established between the CCP and the ORNL TWPC as documented in CCP-PO-027, Rev. 6, CCP/TRU Waste Processing Center/Oak Ridge National Laboratory Interface Document. This document describes the interfaces, roles and responsibilities, and program requirements applicable to both organizations in support of CCP waste characterization activities at the ORNL TWPC.
Program interface requirements evaluated included responsibilities of the ORNL TWPC Site Management Representative (SMR), the CCP VPM, the CCP SPM, and the CCP QA Engineer. The audit team concluded that requirements evaluated, as described in the interface document, were satisfactorily implemented. No concerns were identified.

5.3 Quality Assurance Activities

The audit team evaluated the QA elements for personnel qualification and training, nonconformances, and records for compliance with requirements in the WIPP HWFP WAP. The evaluation results for each area audited are described below.

5.3.1 Personnel Qualification and Training

The audit team conducted interviews and reviewed implementing procedure CCP-QP-002, Rev. 42, CCP Training and Qualification Plan, to determine the degree to which the procedure adequately addresses upper-tier requirements. The audit team determined that CCP-QP-002 has undergone a major revision, and multiple derivative procedures have been issued to support its implementation.

The audit team reviewed implementing procedures to determine the degree to which they address upper-tier requirements:

- CCP-PO-049, Rev. 0, CCP Training Implementation Matrix
- CCP-QP-041, Rev. 0, CCP Job Needs Analysis and Design
- CCP-QP-042, Rev. 0, CCP Project Level Training and Qualification
- CCP-QP-043, Rev. 0, CCP Operations Level Training and Qualification
- CCP-PO-047, Rev. 0, CCP Training and Qualification Program Document

Results of the review indicate that the procedures adequately address upper-tier requirements.

Personnel training records associated with VE, RTR, NDA, DTC, AK, FGA, and SPM were examined to verify implementation of associated requirements and to verify that personnel performing waste characterization activities are appropriately qualified. Record reviews included qualification cards and other pertinent qualification documentation, such as attendance sheets/briefings on newly-revised AK summaries for RTR and VE operators; appointment letters for VE experts (VEEs), RH waste technical staff, and NDA expert analysts (EAs); comprehensive exams; test drum and training container documentation; and eye examinations for qualified RTR operators. One concern was identified related to the CCP training program. CCP qualification cards have not been updated to reflect the newly-developed CCP training procedure structure. Qualification cards for initial and/or re-qualification are currently only in draft
format. CCP training personnel indicate that all qualification cards will receive Job Needs Analysis as appropriate and will be reviewed and approved at levels commensurate with their original issue. The analysis and review and approval will be performed as new candidates or re-qualification candidates request qualification cards from CCP Training in accordance with procedure. The audit team concluded that if these qualification cards are not updated to reflect the newly-developed training program, potential indoctrination training may not be identified and provided to the trainee (see Observation 1 in section 6.3).

With the exception of the concern identified, the procedures reviewed and objective evidence assembled provided evidence to confirm that the applicable requirements for personnel qualification and training were adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

5.3.2 Control of Nonconforming Items

The audit team reviewed implementing procedure CCP-QP-005, Rev. 25, *CCP TRU Nonconforming Item Reporting and Control*, to determine the degree to which the procedure adequately addresses upper-tier requirements. Results of the review indicate that the procedure adequately addresses upper-tier requirements. The audit team interviewed the CCP QA Engineer and randomly selected nonconformance reports (NCRs) for review.

The following NCRs reviewed were initiated at the data generation level (DGL):

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<tr>
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<tr>
<td>NCR-RHORNL-0428-16</td>
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The following NCRs reviewed were initiated at the project level (PL):

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<td>R0</td>
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<tr>
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</tbody>
</table>
NCR-ORNL-0149-16  R1
NCR-ORNL-0325-16  R1
NCR-RHORNL-0271-16  R0
NCR-RHORNL-0273-16  R2

The team concluded that nonconformances are being appropriately documented and tracked through resolution as required. NCRs reviewed included original and revised NCRs. There were no NCRs related to CH or RH waste characterization activities written at the PL that required reporting to CBFO. The audit team verified CCP personnel are familiar with the process for reporting NCRs to the Permittee via email to CBFO within the time frame required by the Permit. All the NCRs examined were verified to have been entered, managed, and tracked in both the CCP Integrated Data Center (IDC) and the NCR Logs, as well as through the required reconciliation reporting mechanism. The CCP QA Engineer performed an evaluation of all NCRs written within the last 12 months and determined that there were 7 NCRs of similar subject that identified a reportable trend. This evaluation resulted in generation of NCR-ORNL-0117-17 and an associated WIPP Form, WF17-181, that address programmatic corrective actions.

The procedures reviewed and objective evidence assembled provided evidence to confirm that the applicable requirements for nonconformances are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.3.3 QA Records

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the control and administration of QA records to determine the degree to which the procedures adequately address upper-tier requirements:

- CCP-PO-001, Rev. 22, CCP Transuranic Waste Characterization Quality Assurance Project Plan
- CCP-QP-008, Rev. 26, CCP Records Management
- CCP-QP-028, Rev. 17, CCP Records Filing, Inventorying, Scheduling, and Dispositioning

Results of the review indicate that the procedures adequately address upper-tier requirements.

The level of control for QA records was verified through review of the CH Records Inventory and Disposition Schedule (RIDS) dated June 29, 2016, and the RH RIDS dated June 15, 2016. Each RIDS is reviewed annually, as required. The audit team reviewed a sample of EA15RM3002-1-0, WIPP Records Inventory Work Sheet, forms related to changes proposed for the CH RIDS and the RH RIDS. Changes on the
worksheet forms are adequately collected and detailed for inclusion on the next RIDS release version. The audit team evaluated a sample of transmittal forms used to document submittal of records from the ORNL/CCP Host Site location to the CCP Records Center in Carlsbad, New Mexico. The audit team determined that the completed forms adequately described the records being transmitted, and that the transmittal process was performed in accordance with the procedure.

The audit team verified the maintenance of records in file cabinets and in the electronic system. Records that are maintained in paper copy in the CCP Records Center are placed in locked fire-resistant cabinets. Access to the file cabinets is controlled through the use of keys, and labels placed on each cabinet post the names of personnel approved for access to the files. Files are adequately organized and maintained in both the paper and electronic file systems. Records are adequately segregated from non-record documents. Files that require control of access, such as those determined to be Unclassified Controlled Nuclear Information (UCNI), Official Use Only (OUO), Internal Use Only (IUC), and No Foreign National (NFORN) documents, are maintained on separate electronic servers where computer user access is restricted. Paper copies of these restricted access documents are stored separate from other documents. Records personnel are familiar with requirements for restricted access files and adequately control distribution. Access to electronic files and restricted files is controlled administratively in the case of physical electronic media and by use of server logon/password methods for electronic files maintained on computer servers.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for records are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.4 Technical Activities

Each technical area audited is discussed in detail in the following sections. The method used to select objective evidence is discussed, the objective evidence used to assess compliance with the WIPP HWFP is cited briefly, and the result of the assessment is provided.

5.4.1 Acceptable Knowledge

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the AK process to determine the degree to which the procedures address upper-tier requirements:

- CCP-PO-001, Rev. 22, CCP Transuranic Waste Characterization Quality Assurance Project Plan
- CCP-PO-003, Rev. 14, CCP TRU Authorized Methods for Payload Control (CCP CH-TRAMPAC)
- CCP-PO-505, Rev. 3, CCP RH TRU Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)
- CCP-QP-002, Rev. 42, CCP Training and Qualification Plan
- CCP-TP-001, Rev. 21, CCP Project Level Data Validation and Verification
- CCP-TP-002, Rev. 26, CCP Reconciliation of DQOs and Reporting Characterization Data
- CCP-TP-005, Rev. 29, CCP Acceptable Knowledge Documentation
- CCP-TP-068, Rev. 12, CCP Standardized Container Management
- CCP-TP-500, Rev. 15, CCP Remote-Handled Waste Visual Examination
- WP 13-QA.03, Rev. 26, QA Independent Assessment Program

Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the AK process for characterizing CH TRU mixed SCGs S3000 solids, S4000 soils/gravel, and S5000 debris wastes, and RH TRU mixed SCG S5000 debris waste. The AK audit team specifically evaluated compliance with the WAP requirements listed in the C6-2 checklist along with portions of the C6-1 checklist. Objective evidence was reviewed and compiled to demonstrate compliance with each of the applicable requirements on these checklists. The team also reviewed the AK record with respect to relevant requirements of the WAC and, specifically for the RH waste stream, the requirements of the WCPIP, Rev. 3. A significant portion of the audit addressed the status of enhanced AK products for the waste streams examined with the upper tier requirements identified in the WIPP WAC, Appendices H and I.

The AK auditors reviewed the latest revision to the AK Summary Reports for four distinct waste streams representing the four respective SCGs identified above. The AK Summary Reports and respective waste stream designations are as follows:

- CCP-AK-ORNL-001, Rev. 10, for CH S3000 waste stream OR-NFS-CH-HOM-A and CH S4000 waste stream OR-NFS-CH-SOIL
- CCP-AK-ORNL-002, Rev. 5, for CH S5000 waste stream OR REDC-CH-HET
- CCP-AK-ORNL-500, Rev. 6, for RH S5000 waste stream OR-REDC-RH-HET

These AK summary reports were reviewed by the AK audit team with respect to the information that relates to specific WAP and WAC requirements. In addition, WSPFs or
draft WSPFs and attachments were examined for each audited waste stream. Numerous AK source documents were reviewed to establish support for the waste stream descriptions and parameters noted in the AK summaries, including descriptions of waste processing activities, assignment of hazardous waste numbers, identification of the two most prevalent radionuclides, and the management of the containers in the waste streams.

The audit team also examined the following completed attachments from CCP-TP-005 for each waste stream: the respective AK Documentation Checklist (Attachment 1); the AK Information List (Attachment 4), the AK Hazardous Constituents List (Attachment 5), the respective AK Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (Attachment 6), alongside the justification memoranda for waste material parameter weight estimates; the Radionuclides List (Attachment 7) and AK/NDA memoranda for the CH waste streams; and the Waste Containers List (Attachment 8), together with the Add-Containers documentation that demonstrates that the parameters and properties of containers added to a waste stream are examined to assure that the assignment is appropriate. For some of the attachments, no changes have occurred since the initial draft. CCP-TP-005 requires that when AK summary reports are revised, AK Attachments 5, 6, and 7 must be reexamined and reissued with a new date, even if there are no changes. The audit team confirmed this activity for the two AK Summary Reports that had been revised since the previous audit. The auditors also examined the Container Tracking Spreadsheet and reconciled that data with the AK Waste Container List.

Examples of the resolution of AK discrepancies in the AK record and discrepancy resolution at characterization, alongside the associated AK reevaluation forms, were reviewed and added to the AK objective evidence. WAP-compliant AK Accuracy Reports and the most recent internal surveillance (I17-01, dated December 20, 2016) were also collected and examined. Requisite training records were reviewed for five AK experts (AKEs) and seven SPMs. The audit team also reviewed selected BDRs, discrepancy reports, and NCRs. With regard to non-compliant waste containers, the auditors examined NCRs dealing with prohibited items and compiled objective evidence of container inspection prior to characterization activities. Additionally, it was determined that administrative controls had been used for the NCRs reviewed, rather than tagging, to maintain segregation of some of the containers due to the high radiation levels of the RH waste. AK records were evaluated with regard to compliance through preparation, legibility, accuracy, review, approval, and maintenance.

The WAP-required container traceability exercise was conducted by the AK audit team for a total of eight waste containers from the four waste streams. The containers selected provided BDRs for RTR, VE, NDA, and the DTC process. Additional traceability documentation was collected through IDC database screenshots, AK tracking spreadsheet data, waste container lists, and ORNL waste container input forms completed by the waste generators. The audit team also examined Waste Stream Characterization Checklists and supporting data, reconciling the results of characterization activities with the information in the AK record. The current practice,
however, is to secure characterization data after it has been validated and verified. As a result, the objective evidence reviewed for demonstration of implementation of the Waste Stream Characterization Checklist process is compiled with less recent characterization data.

For waste stream OR-REDC-RH-HET, the AK auditors also reviewed and compiled objective evidence that demonstrates compliance with the requirements of the WCPIP as noted above. Documents reviewed included a WCPIP-compliant AK Accuracy Report, the CCP TRU Waste Correlation and Surrogate Form, and Characterization Reconciliation Reports with the examination of relevant AK source documents supporting these WCPIP requirements. As noted above, the restriction placed on the use of characterization data results in the review of less recent documentation for Accuracy Reports and Characterization Reconciliation Reports to demonstrate compliance.

A significant part of the AK portion of this recertification audit was dedicated to the review of enhanced AK products for the waste streams audited. Those enhanced AK products include the Interface Waste Management Documents List (IWMDL), AK Assessments (AKA), Chemical Compatibility Evaluation (CCE), BOK, and AK Briefings.

**IWMDL**

An Interface Waste Management Documents List (AK Attachment 9) has been developed and maintained for two of the four waste streams audited; that is, OR-REDC-CH-HET and OR-REDC-RH-HET. A single IWMDL covers activities in the TWPC for both of these waste streams. The IWMDL includes a current list of generator site plans, procedures, and reports associated with current waste management and packaging (e.g., waste management, waste generation, waste treatment, waste packaging, waste repackaging, waste remediation, waste stream delineation, and waste characterization procedures) that have the ability to affect waste stream characterization and certification activities. The audit team has previously examined the procedures and processes on this list and verified walk-downs. During this audit, the team examined objective evidence that assured that revisions to these procedures were identified, reviewed, and properly documented. An IWMDL has not been prepared for the OR-NFS-CH-SOIL waste stream, and an IWMDL is not required for waste stream OR-NFS-CH-HOM-A since it is no longer generated.

**AKA**

An AKA, C236, has been completed for waste stream OR-NFS-CH-SOIL. The audit team reviewed the contents of that assessment in some detail. Supporting AK source documents were examined along with review comments from CCP reviewers and the ORNL representative. A list of containers covered by this AKA was also examined and compared with data on the Container Tracking Spreadsheet. There are no AKAs for the OR-NFS-CH-SOIL, OR-REDC-CH-HET, and OR-REDC-RH-HET waste streams, although the auditors were told that a draft AKA for the OR-REDC-CH-HET waste stream is being developed.
CCE
A CCE memorandum (CCEM), CCE001, for waste stream OR-NFS-CH-SOIL has been prepared, reviewed, and approved by CBFO. That approval was rescinded in December 2016 when all approved CCEMs were withdrawn. The audit team examined the CCEM, review comments, and supporting AK source documentation. CCEMs have not been prepared for waste streams OR-NFS-CH-HOM-A, OR-REDC-CH-HET, and OR-REDC-RH-HET. That CCEM would be directly applicable to the OR-REDC-CH-HET waste stream as well.

AK Briefings
When an AK summary report is revised, current CCP and WAC guidance requires that a presentation be prepared and provided to requisite CCP characterization staff. In addition, if the waste stream covered by the AK summary has an IWMDL, the points-of-contact and Subject Matter Expert, along with the generator site SMR, are required to attend the briefing. For the two AK Summary Reports revised since the last audit, CCP-AK-ORNL-002 and OR-AK-ORNL-500, the audit team examined a copy of the briefing presentations and also compiled an attendance list that confirmed that all appropriate personnel were briefed.

Basis of Knowledge
CCP has added language in CCP-TP-005, Rev. 29, that addresses the development of a BOK memorandum. However, until a BOK procedure is issued that addresses waste at the generator sites, further activities cannot take place.

The AK audit team documented three concerns during the audit. One concern addressed the language in CCP-TP-005, Rev. 29, regarding when an IWMDL is required and when an AKA is required, and whether CCP should assess the need for interface agreements with NFS, REDC, and other ORNL affiliates that may generate waste in the future and have CBFO/DOE involvement in the development of these interface agreements (see Recommendation 1 in section 6.4).

The audit team documented a second concern regarding poly beads not being included in the debris waste stream description for OR-REDC-CH-HET from AK Summary Report, CCP-AK-ORNL-002. During the review of RTR BDRs, it was identified that an RTR operator scanned a container with poly beads and incorrectly identified the poly beads as absorbent. Since the debris waste stream container appeared to be over 50 percent homogeneous material, an NCR was written on the nonconforming condition. After an AKE reviewed the container information, it was conveyed to RTR that what appeared to be absorbent was actually plastic beads, which were correctly assigned to the debris waste stream. However, the RTR operator was not comfortable revising the RTR data sheet because poly beads were not listed in the waste stream description. Although several examples of plastic were included in the waste stream description, poly beads were not specifically listed. In addition, the unique use of poly beads, i.e., neutron shielding, was not discussed in the AK Summary Report (see Observation 2 in section 6.3).
A third concern was identified regarding waste stream NFS-CH-HOM-B identified in AK Summary Report CCP-AK-ORNL-001. Recent training records did not include waste stream NFS-CH-HOM-B as an active waste stream. Waste stream NFS-CH-HOM-B was added to the AK Summary Report in 2011, anticipating that containers of waste would be generated. To date, no containers of waste have been generated and it is unlikely that this waste stream will be utilized. It was recommended that NFS-CH-HOM-B be removed from the AK Summary Report (see Recommendation 2 in section 6.4).

The AK auditors concluded that with respect to the AK requirements in the WCPIP, the WIPP WAC, and the HWFP WAP, the CCP processes applied to the four waste streams representing the four SCGs examined are adequate with respect to procedural compliance with requirements of upper tier documents. However, no evidence of completed requisite enhanced AK products was provided for review and the audit team concluded that until all enhanced AK requirements are implemented, the AK process must be deemed indeterminate.

5.4.2 Project-Level Data Validation and Verification

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the PL/V&V process to determine the degree to which the procedures address upper-tier requirements:

- CCP-TP-001, Rev. 21, CCP Project Level Data Validation and Verification
- CCP-TP-002, Rev. 26, CCP Reconciliation of DQOs and Reporting Characterization Data
- CCP-TP-500, Rev. 15, CCP Remote-Handled Waste Visual Examination
- CCP-TP-504, Rev. 18, CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
- CCP-PO-045, Rev. 2, CCP Waste Management Field Observation
- CCP-TP-200, Rev. 1, Chemical Compatibility Evaluation Memorandum and Acceptable Knowledge Assessment Review
- CCP-TP-201, Rev. 0, Verification of Shipping Criteria and Emplacement Criteria

Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the following BDRs in support of both CH and RH waste characterization activities completed at the ORNL to verify that PL/V&V activities are performed in compliance with applicable procedural requirements:

RTR
OR-RTR6-0764
OR-RTR6-0792
OR-RTR6-0773
The audit team reviewed WSPFs for OR-REDC-RH-HET Change Notice #1, OR-REDC-RH-HET and OR-REDC-CH-HET. The WSPFs were properly completed with Characterization Information Summaries (CIS). CIS lots were reviewed for OR-REDC-RH-HET lots 34 and 35, and OR-REDC-CH-HET lots 78 and 79.

The audit team verified the required quarterly repeat of the DGL data by the project level for the following:

- 4th Quarter 2016 Requests and Results for VE, RTR, RH-VE (results for 4th Quarter VE have not been issued to records as of this audit)
- 3rd Quarter 2016 Requests and Results for VE, RTR, RH-VE
- 2nd Quarter 2016 Requests and Results for VE, RTR, RH-VE
- 1st Quarter 2016 Requests and Results for VE, RTR, RH-VE

The results from each quarterly package indicate there were no inconsistencies reported in the data.

The audit team reviewed all of the completed Attachment 1 - Waste Management Field Observation Planning, and Attachment 2 - Waste Management Field Observation Results from CCP-PO-045, Rev. 2, CCP Waste Management Field Observation. The scheduling of WMFO frequency is entered into the IDC to ensure scheduling is maintained. After the WMFO results are complete, the SPM reviews the results and updates IDC for the next scheduled observation. WMFOs are completed on a waste stream basis.

The audit team determined that only qualified personnel will perform work to procedure CCP-TP-200, Rev. 1, Chemical Compatibility Evaluation Memorandum and Acceptable Knowledge Assessment Review. The SPM will use the OAKES database for the performance of the procedure, and the OAKES database was verified by the audit team to be a part of the CCP Software Quality Assurance Program. Based on interviews with
the SPM, the CCEM and AKA review are completed by the SPM and reviewed in OAKES. After the OAKES review, the CCEM and AKA are uploaded into the WDS and reviewed by two other SPMs. A revised CCEM or AKA can be uploaded into WDS. At the time of the audit, there had been no activity performed by CCP for this procedure.

The audit team determined that only qualified personnel will perform work to procedure CCP-TP-201, Rev. 0, Verification of Shipping Criteria and Emplacement Criteria. The SPM verifies the Previously Certified Waste Shipping Criteria Review and generates Attachment 1 - SPM Previously Certified Waste Shipping Criteria Review Checklist. After the Attachment 1 is completed, it is submitted to CCP Records and the SPM provides a copy to the WDS Data Administrator. At the time of the audit, there had been no activity performed by CCP for this procedure.

One concern was identified during the PL/V&V review. It was discovered that a non-editorial change (i.e., incorrect calibration due date recorded on the BDR) was made to a BDR without receiving the same level of review or approval as the original record (see CAR 17-032 in section 6.1).

With the exception of the concern identified, the procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for PL/V&V activities are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

5.4.3 Real-time Radiography

The audit team evaluated the adequacy, implementation, and effectiveness of ORNL/CCP activities to characterize CH SCGs S4000 soils/gravel waste and S5000 debris waste using RTR Unit #6. BDRs from RTR Unit #6 were evaluated during the audit. BDRs and field activities were not evaluated during this audit for SCG S3000 solids waste due to inactivity for this SCG.

The audit team also evaluated ORNL/CCP’s compliance to changes in the WIPP WAC, Rev. 8, as applicable to RTR being performed at the ORNL for CH SCGs S3000 solids, S4000 soils/gravel, and S5000 debris waste.

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the RTR process to determine the degree to which the procedures address upper-tier requirements:

- CCP-PO-001, Rev. 22, CCP Transuranic Waste Characterization Quality Assurance Project Plan
- CCP-QP-002, Rev. 42, CCP Training and Qualification Plan
- CCP-QP-041, Rev. 0, CCP Job Needs Analysis and Design
- CCP-QP-043, Rev. 0, CCP Operations Level Training and Qualification
- CCP-TP-028, Rev. 10, CCP Radiographic Training Container Construction
- CCP-TP-053, Rev. 16, CCP Standard Real-Time Radiography (RTR) Inspection Procedure
- CCP-TP-165, Rev. 3, CCP Real-Time Radiography #6 Operating Procedure

Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team examined the following CH RTR BDRs generated by characterizing waste in RTR Unit #6:

- OR-RTR6-0731
- OR-RTR6-0743
- OR-RTR6-0752
- OR-RTR6-0765
- OR-RTR6-0768
- OR-RTR6-0777
- OR-RTR6-0795
- OR-RTR6-0802
- OR-RTR6-8000
- OR-RTR6-0734
- OR-RTR6-0735

The audit team observed RTR operations for RTR Unit #6, interviewed the RTR operators, and verified the use of current AK summaries and RTR operating procedures. The audit team also examined RTR Unit #6 operational logbook CCP-CH-ORNL-RTR-Unit6-01, 2017, ORNL-TWPC-RTR6, 7880J, and verified logbook entries were reviewed by the VPM, as required. The audit team also verified the use of several CCP standing orders. The audit team observed the image (lines/pair) test and the RTR characterization scan on containers X10C1400650F and X10C1400650I from BDR OR-RTR6-0808 and waste stream OR-REDC-CH-HET performed on RTR Unit #6. The RTR unit contained the components required by the HWFP WAP to effectively characterize waste from each CH SCG subject to the scope of the audit.

The audit team verified that RTR operators were appropriately trained and qualified as required by the HWFP WAP; CCP-QP-002, CCP Training and Qualification Plan; and CCP-QP-043, CCP Operations Level Training and Qualification. The audit team examined required RTR operator training container data and evaluation sheets, with the applicable audio/video media for three RTR operators. RTR training and qualification records reviewed included ASNT SNT-TC-1A certificates; container inventory sheets (as required by CCP-TP-028, Attachment 1); annual eye exams; and waste stream training for the applicable AK summaries. Semiannual training and requalification documentation and associated audio/video media were also evaluated and found to be compliant with applicable requirements.

The audit team also verified the following WIPP WAC, Rev. 8, Appendix F requirements were met: RTR training changes included removal of the test drum required elements; contents of the training containers reflect the waste stream description of one or more of the waste streams currently being characterized at ORNL; training containers were examined using the same process and procedures used for examining TRU and TRU-
mixed waste; and training container examinations were performed by each operator semiannually, as required.

Additionally, the audit team referenced CBFO Office of National TRU Program (NTP) memorandum CBFO:TSTD:NC:MR:16-1992, dated July 11, 2016, which stated:

"Waste Isolation Pilot Plant Certified Programs (WCP) may continue to perform RTR with currently qualified operators until their semiannual continuing education refresher training or biennial requalification is due (whichever comes first) at such time the revised requirements stated in the WAC, Rev. 8, Appendix F must be incorporated in the WCP's system of controls and met using the CBFO approved procedures."

No concerns were identified. The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for RTR are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

5.4.4 Visual Examination

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to VE process to determine the degree to which the procedures address upper-tier requirements:

- CCP-TP-113, Rev. 20, CCP Standard Contact-Handled Waste Visual Examination
- CCP-TP-500, Rev. 15, CCP Remote-Handled Waste Visual Examination
- CCP-QP-002, Rev. 42, CCP Training and Qualification Plan
- CCP-QP-043, Rev. 0, CCP Operations Level Training and Qualification

Results of the review indicate that the procedures adequately address upper-tier requirements.

ORNL/CCP uses the two-operator method when performing VE characterization of waste. The audit team interviewed VE operators and the VEE. The audit team also examined the VE operational logbooks (CCP-CH-ORNL-VE-01 and CCP-RH-ORNL-VE-01) and verified logbook entries were logged correctly and reviewed by the VPM as required. During the audit, the VE audit team toured the TWPC Hot Cell Facility and observed VE being performed on RH container ORRH00873 and CH container X10C9402660J.

The audit team examined the following CH and RH VE BDRs generated from operations performed in the TWPC Hot Cell Facility to verify implementation and
compliance with the requirements for documenting VE activities, as specified in CCP-TP-113 and CCP-TP-500:

- ORNLRHVE16027
- ORNLRHVE16031
- ORNLRHVE16036
- ORNLRHVE16050
- ORNLRHVE16051
- ORNLRHVE16057
- ORNLRHVE16072
- ORNLRHVE16078
- ORNLRHVE16084
- ORNLRHVE16087
- ORNLRHVE17001
- ORNLRHVE17002
- ORVECH0163
- ORVECH0164
- ORVECH0165
- ORVECH0167
- ORVECH0168

The audit team examined training records for five VE operators/independent technical reviewers (ITRs), and confirmed the appointment of one ORNL/CCP VEE. The audit team verified that VE operators, ITRs, and the VEE were appropriately trained and qualified as required.

The audit team also verified continued corrective actions for CAR 16-035 identified during the previous audit (A-16-15) related to a departure from a requirement to apply a TID to a container when access to the container is uncontrolled. No similar instances were identified during this audit.

One concern was identified during the review of a VEE appointment letter. During the audit, it was discovered that an obsolete version of an SPM Appointment Letter form (Attachment 7 from Rev. 38 of CCP-QP-002) was utilized to prepare the SME/VEE appointment letter dated 6-23-15 (see CAR 17-031 in section 6.1).

With the exception of the concern identified, the procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for VE are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results.

### 5.4.5 Nondestructive Assay

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the NDA process to determine the degree to which the procedures address upper-tier requirements:

- CCP-TP-046, Rev. 6, *CCP Mobile IQ3 System Calibration Procedure*
- CCP-TP-047, Rev. 13, *CCP Mobile IQ3 Gamma Scanner Operation*
- CCP-TP-048, Rev. 17, *CCP ORNL NDA System Data Reviewing, Validating, and Reporting Procedure*
• CCP-TP-076, Rev. 2, *CCP Operating the Mobile ISOCS Large Container Counter Using NDA 2000*

• CCP-TP-077, Rev. 2, *CCP Calibrating the Mobile ISOCS Large Container Counter Using NDA 2000*

• CCP-TP-058, Rev. 6, *CCP NDA Performance Demonstration Program*

Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the adequacy, implementation, and effectiveness of NDA activities at ORNL to characterize CH SCGs S3000 solids waste, S4000 soils/gravel waste, and S5000 debris waste using the Mobile Qualitative and Quantitative Drum Counter with Isotopics (IQ3) and the Mobile ISOCS Large Container Counter 2 (MILCC2).

**MILCC2**

The audit team interviewed MILCC2 operators, observed actual measurement operations, and interviewed ORNL/CCP representatives to verify compliance with operating procedures and governing requirements applicable to NDA contained in the CBFO QAPD, the *CCP Transuranic Waste Certification Plan*, the WIPP WAC, and the WCPIP.

The audit team requested and reviewed the following batch data reports prior to the audit:

- OR-MILCC2-0293
- OR-MILCC2-0294
- OR-MILCC2-0295
- OR-MILCC2-0296
- OR-MILCC2-0297
- OR-MILCC2-0298
- OR-MILCC2-0300

- OR-MILCC2-0301
- OR-MILCC2-0017
- OR-MILCC2-0018
- OR-MILCC2-0019
- OR-MILCC2-0091
- OR-MILCC2-0226

Though the current revision of the WIPP WAC (Rev. 8.0) no longer requires the performance of weekly interfering matrix checks, some of the BDRs that were randomly selected for review contained drums that originally were assayed on the MILCC2 in 2014 and 2015.

The following documents were reviewed and provided to the audit team prior to and during the audit:

- CI-MILCC2-NDA-1004, *Calibration Verification Report for the MCS MILCC2*, Rev. 0, dated April 15, 2014

ORNL/CCP performed a single calibration verification, documented in CI-MILCC2-NDA-1009, *Calibration Verification Report for the MCS MILCC2*, Rev. 0, on March 7, 2017. Due to an improperly functioning LN2 fill system, both Detectors 1 and 2 were inadvertently allowed to warm up requiring factory service. The audit team reviewed this document and interviewed ORNL/CCP staff about the cause and resolution of the issue that led to the performance of a calibration verification. The audit team found that the description of the cause and resolution were technically adequate.

**IQ3**

The audit team interviewed IQ3 personnel, which included operators and NDA expert analysts. The audit team also reviewed electronic and paper copies of reports and records. Further, based on a review of the current revisions of CBFO requirements documents (WIPP WAC, Rev. 8) and CCP procedures (listed above) provided prior to the audit, checklists were prepared and used to evaluate the following:

- Operability and condition of the IQ3 since Audit A-16-15
- System stability as evidenced by the implementation and effectiveness of quality control measurements and three calibration verifications (*Calibration Verification for the MCS IQ3*, Rev. 0, MCS-IQ3-CALVER-2016-02, dated April 20, 2016; MCS-IQ3-CALVER-2016-03, dated December 13, 2016, and *Calibration Verification for the MCS IQ3*, Rev. 0, MCS-IQ3-CALVER-2017-01, dated March 29, 2017).
Successful calibration verifications and calibration confirmation, as required
Applicability of each system's calibration and operational range to the waste assayed since Audit A-16-15
Successful participation in the CBFO-sponsored PDP
Completed BDRs to ensure data are collected, analyzed, reviewed, and reported as required
Data storage and retrievability

The following IQ3 BDRs were reviewed prior to and during the audit:

- OR-IQ3-0648
- OR-IQ3-0654
- OR-IQ3-0657
- OR-IQ3-0661
- OR-IQ3-0663
- OR-IQ3-0665
- OR-IQ3-0667
- OR-IQ3-0224
- OR-IQ3-0225

Though the current revision of the WIPP WAC (Rev. 8.0) no longer requires the performance of weekly interfering matrix checks, some of the BDRs that were randomly selected for review contained drums that originally were assayed on the IQ3 in 2013.

The audit team also verified ORNL/CCP successfully participated in PDP Cycle 23A that included two matrices (metals and glass). CBFO memorandum CBFO:TSTD:NC:MR:16-1984 documents the results of the PDP test.

The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for NDA are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.4.6 Radiological Characterization (Dose-to-Curie)

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to the DTC process to determine the degree to which the procedures address upper-tier requirements:

- CCP-TP-504, Rev. 18, CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste

- CCP-TP-509, Rev. 6, CCP Remote-Handled Transuranic Container Tracking

Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the adequacy, implementation, and effectiveness of the DTC methodology used by the ORNL/CCP to characterize waste streams OR-REDC-RH-
HET, OR-RF-RH-HET, and OR-CHEM-RH-HET. The audit team interviewed operators, observed actual measurement operations, and interviewed ORNL/CCP representatives to verify compliance with operating procedures and governing requirements applicable to RH DTC contained in the CBFO QAPD, the CCP Transuranic Waste Certification Plan, the WIPP WAC, and the WCPIP.

The following documents were reviewed and provided to the audit team prior to and during the audit:

- CCP-AK-ORNL-500, Rev. 6, CCP AK Summary Report for ORNL Radiochemical Engineering Development Center RH Transuranic Waste
- CCP-AK-ORNL-503, Rev. 2, CCP ORNL QA Equivalency Report and Procedure Matrix for RH TRU Debris Waste
- CCP-AK-ORL-505A, Rev. 1, CCP Nondestructive Assay Sampling Plan for ORNL Radiochemical Engineering Development Center RH Transuranic Waste (Pre-SETF)
- CCP-RC-ORNL-511, Rev. 0, CCP RH TRU RCTR for ORNL Irradiated Fuels Examination Laboratory RH TRU Waste - Waste Stream: OR-RF-RH-HET

The audit team previously evaluated the collection and analysis of swipe samples from the hot cells; the development of scaling factors that relate the measured dose rate to the average activity; and the actual measurement of the dose rate. Since Audit A-16-15, Rev. 5 of CCP-AK-ORNL-501 (RCTR) was issued. The RCTR was revised in order to add Appendix C, Scaling Factors, for two drums that contained waste from two time periods; add Appendix D to address drums resulting from a hot cell maintenance outage with waste from different time periods; add Appendix E to describe the use of neutron dose-to-curie for some time periods; and add Appendix F to address REDC waste generated in the post-2007 time period. These changes to the RCTR were reviewed in advance of this audit and found to be technically adequate. For DTC, the dose rate is defined as the external exposure rate from gamma-ray emitting radionuclides within the waste matrix, predominately Cesium-137 (Cs-137).

The audit team requested and reviewed the following BDRs:

• ORRHDTCT16008
• ORRHDTCT16010
• ORRHDTCT16015
• ORRHDTCT16020
• ORRHDTCT16029
• ORRHDTCT17001

The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for radiological characterization are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.4.7 WIPP Waste Information System (WWIS)/Waste Data System (WDS)

The audit team conducted interviews and reviewed implementing procedures relative to the WWIS/WDS data entry process to determine the degree to which the procedures adequately address upper-tier requirements. The procedures reviewed included:

• CCP-TP-030, Rev. 36, CCP CH TRU Waste Certification and WWIS/WDS Data Entry

• CCP-TP-530, Rev. 12, CCP RH TRU Waste Certification and WWIS/WDS Data Entry

Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team evaluated the implementation of the WWIS/WDS data entry procedures for electronic population of data, manual up-date of data, and electronic data transfer of data from the IDC software database to the WWIS/WDS. The evaluation included review of electronic records in the IDC, review of data up-date by a waste certification
assistant, and waste certification by a waste certification official (WCO). Other records reviewed included container information summaries, pages from BDRs showing analyses values in the IDC, WWIS/WDS Waste Container Data Reports, and submittals for WWIS/WDS review/approval. Records for data entry of both CH- and RH-type waste characterization and certification data were reviewed.

The audit team reviewed waste characterization case files for three CH containers. ORNL CH containers X10C0402943D, X10C1300181A, and X10C9313000A were certified under the current procedural process, CCP-TP-030, Rev. 36, which provides for certification using modules of the IDC. There have been no RH waste characterization activities performed since the last ORNL/CCP program certification assessment (A-16-15, April 19-21, 2016), so there were no RH waste characterization case files reviewed. When RH characterization activities resume, containers will be processed using CCP-TP-530, Rev. 12, which utilizes functions of the IDC for certification and electronic submittal to WWIS/WDS. There has been no shipping of CH or RH waste, so there were no shipping packages reviewed. The audit team determined that the IDC processes for CH waste container certification were performed in accordance with the appropriate procedures. Per interviews with CCP personnel, the audit team determined that personnel are familiar with the processes for characterization of RH waste containers and building of RH and CH waste packages and that procedure implementation is expected to be adequate once these activities resume.

The audit team determined that there are currently no new WSPFs under consideration for submittal for approval. Because of this, there are no CH or RH waste containers currently being characterized to provide data for approval of a new WSPF. NWP WCO personnel are familiar with the process of characterization of CH and RH waste containers for submitting in conjunction with a new WSPF.

The audit team interviewed WCO personnel regarding procedure work steps for performance of Unreviewed Safety Question Determinations (USQDs) and Material at Risk (MAR) evaluations. The audit team determined that WCO personnel have not received containers for certification that exceed the WIPP WAC PE-Ci limit requiring a USQD, and WCO personnel have not received a request from a transportation certification official for a high MAR evaluation. The audit team determined that WCO personnel are familiar with these two processes, simulations of procedure steps have been performed, and that implementation is expected to be adequate if personnel receive containers or evaluation requests.

The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for WWIS/WDS data entry are adequately established, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.
5.4.8 Flammable Gas Sampling and Analysis

The audit team conducted interviews with responsible FGA personnel and confirmed that ORNL/CCP personnel performing FGA use DOE procedure DOE/WIPP 06-3345, Rev. 10, Waste Isolation Pilot Plant Flammable Gas Analysis. A walkthrough of the FGA CH drum sampling area was performed, and the instrumentation and equipment was verified to be acceptable. A demonstration of sampling and analysis was observed. The following FGA BDRs were examined:

- OR16FG11014
- OR17FG11003
- OR17FG8004
- OR17FG8008
- OR16FG11010
- OR16FG11019
- OR16FG11027
- OR16FG11030
- OR17FG11002
- SR1311014_MDL (minimum detection limit)
- LA10FG8002_MDL
- OR16FG11001_ICAL (initial calibration)
- OR16FG8044_ICAL
- OR16FG8075_ICAL
- OR16FG8122_ICAL

All FGA BDRs were determined to have been completed accurately and compliantly. The audit team also examined training and qualification documentation for FGA operators and determined the operators were qualified and able to perform FGA operations.

The audit team observed sampling operations for both CH and RH waste containers immediately followed by sample analysis. No discrepancies were detected for either sampling or analysis of the CH or RH containers observed.

The audit team verified that an independent technical review was performed following analytical BDR completion, that any discrepancies were noted and returned to the analyst for correction, and that the completed and reviewed BDR was submitted to CCP Records in accordance with CCP procedures.

The procedures reviewed and objective evidence assembled concluded that the applicable requirements for FGA are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

5.4.9 Container Management

The audit team reviewed the following implementing procedure for container management (CM) activities conducted at ORNL by the CCP. The audit team verified that CCP conducts CM activities only for CH waste, using procedure CCP-TP-068, Rev. 12, CCP Standardized Container Management. CM activities for RH waste are performed by ORNL personnel using ORNL procedures.
The audit team interviewed personnel and examined in-process and completed records for containers undergoing waste characterization, observed CM activities from initiating containers into the CCP characterization process to final characterization, and verified that CCP ORNL storage of acceptable containers reasonably precluded shipment of unacceptable containers to the WIPP.

The audit team verified CM activities are being performed in compliance with the applicable procedural requirements.

The procedure review, field observations, and document reviews provided evidence that the applicable requirements for container management are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No concerns were identified.

6.0 CARs, CDAs, OBSERVATIONS, AND RECOMMENDATIONS

6.1 Corrective Action Reports

During the audit, the audit team may identify conditions adverse to quality (CAQs), as defined below, and document such conditions on CARs.

Condition Adverse to Quality (CAQ) – Term used in reference to failures, malfunctions, deficiencies, defective items, and nonconformances.

Significant Condition Adverse to Quality – A condition which, if uncorrected, could have a serious effect on safety, operability, waste confinement, TRU waste site certification, compliance demonstration, or the effective implementation of the QA program.

The following CARs were issued as a result of this audit:

CAR 17-031

Condition:

During the audit, it was identified that an obsolete version of an SPM Appointment Letter form (Attachment 7 from Rev. 38 of CCP-QP-002), was utilized to prepare an SME/VEE appointment letter dated 6-23-15.

Requirement:

CCP-PO-005, Rev. 28, CCP Conduct of Operations, section 18.7 states: "Procedures and fillable forms will be verified current at the beginning of each shift. Procedure revisions will be verified against the current revision of the procedure posted in the Controlled Documents folder on the CCP sftp site."
CAR 17-032

Condition:

A data affecting, non-editorial change (i.e., incorrect calibration due date recorded on BDR) was made to BDR ORRHDTCT16029 without receiving the same level of review or approval as the original record.

Requirement:

CCP-QP-008, Rev. 26, CCP Records Management, section 4.7.1 Note states: “Editorial changes may be made to records without the same level of review or approval as the original record. Editorial changes include ONLY the following:

- Correcting grammar or spelling (the meaning has not changed)
- Renumbering sections, attachments, or pagination, providing the original intent of the record has not been altered
- Clarification statements that do not affect the technical or quality content of the record
- Sections without an “N/A” entry, for which “N/A” is the appropriate notation for the record.”

6.2 Deficiencies Corrected During the Audit

During the audit, the audit team may identify CAQs. Audit team members, the Audit Team Leader (ATL), and the CBFO QA Management Representative evaluate the CAQs to determine if they are significant. Once a determination is made that the CAQ is not significant, the audit team member, in conjunction with the ATL and the CBFO QA Management Representative, determines if the CAQ is a minor and isolated case requiring only remedial action and therefore can be corrected during the audit.

Upon determination that the CAQ is minor and isolated, the audit team member, in conjunction with the ATL and the CBFO QA Management Representative, evaluates/verifies any objective evidence/actions submitted or taken by the audited organization and determines if the condition was corrected in an acceptable manner. Once it has been determined that the CAQ has been corrected, the CBFO QA Management Representative categorizes the condition as corrected during audit (CDA) according to the definition below.

CDAs – Isolated deficiencies that do not require a root cause determination or actions to preclude recurrence. Correction of the deficiency can be verified prior to the end of the audit. Examples include one or two minor changes required to correct a procedure (isolated), one
or two forms not signed or not dated (isolated), and one or two individuals that have not completed a reading assignment.

No CAQs were corrected during this audit.

6.3 Observations

During the audit, the audit team may identify potential problems that should be communicated to the audited organization. The audit team members, in conjunction with the ATL, evaluate these conditions and classify them as Observations using the following definition:

Observation – A condition that, if not controlled, could result in a CAQ.

Once a determination is made, the audit team member, in conjunction with the ATL, categorizes the condition appropriately.

Observation 1

CCP qualification cards have not been updated to reflect the newly-developed CCP training procedure structure. Qualification cards for initial and/or re-qualification are currently only in draft format. CCP training personnel indicate that all qualification cards will receive Job Needs Analysis as appropriate and will be reviewed and approved at levels commensurate with their original issue. The analysis and review and approval will be performed as new candidates or re-qualification candidates request qualification cards from CCP Training in accordance with procedure. The audit team concluded that if these qualification cards are not updated to reflect the newly-developed training program, potential indoctrination training may not be identified and provided to the trainee.

Observation 2

Poly beads are not being included in the debris waste stream description for OR-REDC-CH-HET from CCP-AK-ORNL-002. During the review of RTR BDRs, it was identified that an RTR operator scanned a container with poly beads and incorrectly identified the poly beads as absorbent. Since the debris waste stream container appeared to be over 50% homogeneous material, an NCR was written on the nonconforming condition. After an AKE reviewed the container information, it was conveyed to RTR that what appeared to be absorbent was actually plastic beads, which were correctly assigned to the debris waste stream. However, the RTR operator was not comfortable revising the RTR data sheet because poly beads were not listed in the waste stream description. Although several examples of plastic were included in the waste stream description, poly beads were not specifically listed. In addition, the unique use of poly beads, i.e., neutron shielding, was not discussed in the AK summary report. If poly beads are not added to the waste stream description, a nonconformance may occur.
6.4 Recommendations

During the audit, the audit team may identify suggestions for improvement that should be communicated to the audited organization. The audit team members, in conjunction with the ATL, evaluate these conditions and classify them as Recommendations using the following definition:

Recommendations – Suggestions that are directed toward identifying opportunities for improvement and enhancing methods of implementing requirements.

Once a determination is made, the audit team member, in conjunction with the ATL, categorizes the condition appropriately.

Recommendation 1

It was recommended that CCP reassess CCP-TP-005 to assure that the process for developing IWMDLs and AKAs is better defined to describe all possible scenarios for active, inactive, and certified waste stream populations or sub-populations. Furthermore, CCP should assess the need for interface agreements with NFS, REDC, and other ORNL affiliates that may generate waste in the future, and have CBFO/DOE involvement in the development of these interface agreements.

Recommendation 2

Waste Stream NFS-CH-HOM-B (from AK Summary Report CCP-AK-ORNL-001) was developed in anticipation of a future waste stream being generated. Waste Stream NFS-CH-HOM-B was initially included in CCP-AK-ORNL-001, Rev. 7, issued May 10, 2011. However, to date, no containers have been assigned to this waste stream. It was recommended that if this waste stream will not be developed, it should be removed from the AK Summary Report.

7.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit
Attachment 2: Summary Table of Audit Results
Attachment 3: Table of Audited Documents
Attachment 4: List of Processes and Equipment Reviewed
<table>
<thead>
<tr>
<th>NAME</th>
<th>ORG/TITLE</th>
<th>PRE-AUDIT MEETING</th>
<th>CONTACTED DURING AUDIT</th>
<th>POST-AUDIT MEETING</th>
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**Definitions**

E = Effective  
S = Satisfactory  
I = Indeterminate  
M = Marginal  
U = Unsatisfactory  
CAR = Corrective Action Report  
CDA = Corrected During Audit  
Obs = Observation  
Rec = Recommendation  
A = Adequate  
NE = Not Effective  
NA = Not Adequate
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## List of Processes and Equipment Reviewed

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<th>WIPP #</th>
<th>Process/Equipment Description</th>
<th>Applicable to the Following Waste Streams/Groups of Waste Streams</th>
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<td>Nondestructive Assay – Canberra Mobile Qualitative and Quantitative Drum Counter with Isotopics (IQ3) Procedures – CCP-TP-046, CCP-TP-047, &amp; CCP-TP-048</td>
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### NEW PROCESSES OR EQUIPMENT

NONE

### DEACTIVATED PROCESSES OR EQUIPMENT

- **16RR2**
  - Real-Time Radiography Mobile Characterization System (MCS) RTR #7
  - Deactivated September 2015
  - N/A