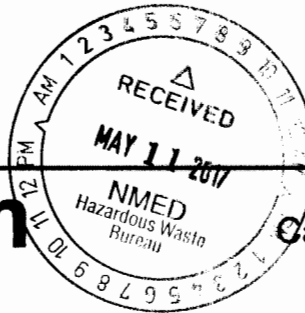


United States Government

memorandum**RECEIVED**
Department of EnergyCarlsbad Field Office
Carlsbad, New Mexico 88221

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 Carlsbad Field Office (CBFO) conducted Audit A-17-21, Oak Ridge National Laboratory/Central Characterization Program (ORNL/CCP) Transuranic (TRU) Waste Characterization Activities, April 18 – 20, 2017. The interim audit report is attached.

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.

Martin P. Navarréte
Senior Quality Assurance Specialist

Attachment



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

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 (PLV&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

OBSERVERS

Tom Carver	CBFO National TRU Program Compliance Division
Jeff Snook	DOE/Office of Enterprise Assessments (EA)-31
Tim Mengers	DOE/EA-31

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 SCG 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

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

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

- 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*
- CCP-TP-506, Rev. 5, *CCP Preparation of Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report*
- 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

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.

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 PLV&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 PLV&V activities are performed in compliance with applicable procedural requirements:

RTR

OR-RTR6-0764
OR-RTR6-0773

OR-RTR6-0792

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*

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

- 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.

ORNL/CCP successfully participated in PDP Cycle 23A that included two matrices (metals and glass). CBFO memorandum CBFO:TSTD:NC:MR:16-1984, *Approval Status Notification for CCP-ORNL - Drum Cycle 23A of the Nondestructive Assay Performance Demonstration Program*, documents the results of the PDP test.

- 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-

- CCP-RH-ORNL-DTC-004, *Operational Logbook for Remote-Handled Dose-to-Curie Operations – Calendar year 2016*

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:

- ORRHDT16008
- ORRHDT16010
- ORRHDT16015
- ORRHDT16020
- ORRHDT16029
- ORRHDT17001

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

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.

CAR 17-032

Condition:

A data affecting, non-editorial change (i.e., incorrect calibration due date recorded on BDR) was made to BDR ORRHDTTC16029 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

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

PERSONNEL CONTACTED DURING AUDIT A-17-21				
NAME	ORG/TITLE	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST-AUDIT MEETING
Ryan Martin	NWP/CCP RH SPM	X	X	X
Shelly Martinez	NWP/CCP CE NDE	X	X	X
Derek Matheny	NWP/CCP VEE	X	X	X
Ray McClure	WAI Operations		X	
Tim Mengers	DOE-HQ EA-31	X		X
Martin Navarrete	CBFO QA Representative	X		X
Fred Oney	NWP/CCP RTR Lead Operator	X	X	X
Berry Pace	NWP/CCP Issues Management/Records	X		X
Sheila Percy	TFE/CCP Records Manager	X	X	X
Eric Pennala	MCS General Manager	X		
Larry Perkins	DOE-HQ EM-43	X		X
Brandye Pyeatt	NWP QA Analyst	X	X	
Mike Ramirez	NWP/CCP Manager			X
Ron Reeves	NWP/CCP Operations Manager	X	X	X
Jeremy Robinson	NWP/CCP Lead FGA	X	X	X
Farok Sharif	NWP/NTP Manager	X		
Craig Simmons	NWP/CCP PM	X	X	X
Patrick Smith II	TFE/CCP Records	X	X	X
Travis Smith	Tech Specs/CCP AKE	X	X	X
Jeff Snook	DOE-HQ EA-31	X		X
Pat Tilmon	NWP/CCP PM	X		X
Shawn Treadway	NWP/CCP Container Manager		X	
Chuck Wallace	NWP/CCP VE Operator		X	
Ronald Whitson	CCP/PSC NDA/DTC Lead	X	X	

TABLE OF AUDITED DOCUMENTS			
	PROCEDURE NUMBER	REV	PROCEDURE TITLE
1.	CCP-PO-001	22	CCP Transuranic Waste Characterization Quality Assurance Project Plan
2.	CCP-PO-002	29	CCP Transuranic Waste Certification Plan
3.	CCP-PO-003	14	CCP Transuranic Authorized Methods for Payload Control (CCP CH-TRAMPAC)
4.	CCP-PO-005	28	CCP Conduct of Operations
5.	CCP-PO-027	6	CCP/TRU Waste Processing Center/Oak Ridge National Laboratory Interface Document
6.	CCP-PO-045	2	CCP Waste Management Field Observation
7.	CCP-PO-047	0	CCP Training and Qualification Program Document
8.	CCP-PO-049	0	CCP Training Implementation Matrix
9.	CCP-PO-505	3	CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP-RH-TRAMPAC)
10.	CCP-QP-002	42	CCP Training and Qualification Plan
11.	CCP-QP-005	25	CCP TRU Nonconforming Item Reporting and Control
12.	CCP-QP-008	26	CCP Records Management
13.	CCP-QP-028	17	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
14.	CCP-QP-041	0	CCP Job Needs Analysis and Design
15.	CCP-QP-042	0	CCP Project Level Training and Qualification
16.	CCP-QP-043	0	CCP Operations Level Training and Qualification
17.	CCP-TP-001	21	CCP Project Level Data Validation and Verification
18.	CCP-TP-002	26	CCP Reconciliation of DQOs and Reporting Characterization Data
19.	CCP-TP-005	29	CCP Acceptable Knowledge Documentation
20.	CCP-TP-028	10	CCP Radiographic Training Container Construction
21.	CCP-TP-030	36	CCP CH TRU Waste Certification and WWIS/WDS Data Entry
22.	CCP-TP-046	6	CCP Mobile IQ3 System Calibration Procedure
23.	CCP-TP-047	13	CCP Mobile IQ3 Gamma Scanner Operation
24.	CCP-TP-048	17	CCP ORNL NDA System Data Reviewing, Validating, and Reporting Procedure
25.	CCP-TP-053	16	CCP Standard Real-Time Radiography (RTR) Inspection Procedure
26.	CCP-TP-058	6	CCP NDA Performance Demonstration Program
27.	CCP-TP-068	12	CCP Standardized Container Management
28.	CCP-TP-076	2	CCP Operating the Mobile ISOCS Large Container Counter Using NDA 2000
29.	CCP-TP-077	2	CCP Calibrating the Mobile ISOCS Large Container Counter Using NDA 2000
30.	CCP-TP-113	20	CCP Standard Contact-Handled Waste Visual Examination
31.	CCP-TP-165	3	CCP Real-Time Radiography #6 Operating Procedure
32.	CCP-TP-200	1	CCEM and AK Assessment Review
33.	CCP-TP-201	0	Verification of Shipping Criteria and Emplacement Criteria
34.	CCP-TP-500	15	CCP Remote-Handled Waste Visual Examination
35.	CCP-TP-504	18	CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
36.	CCP-TP-506	5	CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report
37.	CCP-TP-509	6	CCP Remote-Handled Transuranic Container Tracking
38.	CCP-TP-530	12	CCP RH TRU Waste Certification and WWIS/WDS Data Entry
39.	DOE/WIPP 06-3345	10	Waste Isolation Pilot Plant Flammable Gas Analysis
40.	WP 13-QA.03	26	QA Independent Assessment Program