

United States Government

Department of Energy

memorandum

 Carlsbad Field Office
 Carlsbad, New Mexico 88221


ENTERED

DATE: MAY 22 2012

REPLY TO
ATTN OF: CBFO:OQA:CGF:MAG:12-1409:UFC 2300.00SUBJECT: Transmittal of the Interim Close-Out Audit Report for the Bettis Atomic Power Laboratory
Central Characterization Project Audit A-12-10

TO: Christopher Labee, DOE-NRLFO

The Carlsbad Field Office (CBFO) conducted Audit A-12-10 of the Bettis Atomic Power Laboratory (BAPL) Central Characterization Project (CCP) waste characterization activities on April 24-26, 2012. The CBFO interim audit report is attached.

The audit team concluded that the BAPL/CCP technical and quality assurance programs for remote-handled (RH) transuranic (TRU) Summary Category Group S5000 debris waste characterization activities were adequate in accordance with the Waste Isolation Pilot Plant Hazardous Waste Facility Permit, the *CBFO Quality Assurance Program Document*, the *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, and the *RH TRU Waste Characterization Program Implementation Plan*. Emphasis was placed on characterization reporting activities since the initial certification audit (A-11-12), as well as the process for project termination and closure. The audit team determined that the BAPL/CCP procedures were satisfactorily implemented and the evaluated processes were effective.

As a result of the audit, the TRU waste characterization and certification activities have been completed at the BAPL and applicable requirements for closure have been verified.

If you have any questions or comments concerning this report, please contact Courtland G. Fesmire, P.E., at (575) 234-7548.



for Randy Unger
Director, Office of Quality Assurance

Attachment



Mr. Christopher Labee

-2-

MAY 22 2012

cc: w/attachment

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WIPP Operating Record	ED
CBFO QA File	
CBFO M&RC	

*ED denotes electronic distribution

U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

INTERIM CLOSE-OUT AUDIT REPORT
FOR
TRU WASTE CHARACTERIZATION AND CERTIFICATION ACTIVITIES

PERFORMED BY THE

BETTIS ATOMIC POWER LABORATORY (BAPL)
UTILIZING THE
CENTRAL CHARACTERIZATION PROJECT (CCP)

CARLSBAD, NM

AUDIT NUMBER A-12-10

April 24 - 26, 2012



Prepared by:

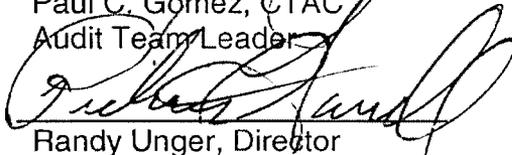


Paul C. Gomez, CTAC
Audit Team Leader

Date:

5/14/2012

Approved by:



Randy Unger, Director
for CBFO Office of Quality Assurance

Date:

5/22/2012

1.0 EXECUTIVE SUMMARY

Carlsbad Field Office (CBFO) Audit A-12-10 was conducted to evaluate the adequacy, implementation, and effectiveness of the transuranic (TRU) waste characterization activities performed by the Washington TRU Solutions (WTS) Central Characterization Project (CCP) for remote-handled (RH) Summary Category Group (SCG) S5000 debris waste at the Bettis Atomic Power Laboratory (BAPL). Emphasis was placed on characterization reporting activities completed since the initial certification audit (A-11-12), as well as the process for project termination and closure. All activities were evaluated to verify compliance with the applicable 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)*, and the *RH TRU Waste Characterization Program Implementation Plan (WCPIP)*.

The audit was performed at the CBFO Skeen-Whitlock Building in Carlsbad, NM, April 24 – 26, 2012. Three conditions adverse to quality (CAQs) were identified and corrected during the audit (CDA) (see section 6.2). There were no CAQs requiring the issuance of a Corrective Action Report (CAR). No observations were identified during the audit, and no recommendations were offered for management consideration.

The audit team concluded that, overall, the BAPL/CCP technical and quality assurance (QA) programs, as applicable to the audited activities, were adequate, satisfactorily implemented, and effective for compliance with upper-tier requirements. TRU waste characterization and certification activities have been completed at the BAPL and applicable requirements for closure have been verified.

2.0 SCOPE AND PURPOSE

2.1 Scope

The audit team evaluated the adequacy, implementation, and effectiveness of the programs and requirements controlling BAPL/CCP TRU waste characterization activities for SCG S5000 RH debris waste stream BT-T001. The following programmatic and technical elements were evaluated.

General

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

Quality Assurance

The following QA elements were evaluated only to the extent needed to support the technical elements listed below:

Personnel Qualification and Training
QA Records
Nonconformances
Sample Control
Control of Measuring and Test Equipment

Technical

Project-Level Validation & Verification (V&V)
Acceptable Knowledge (AK)
Headspace Gas (HSG) Sampling
Visual Examination (VE)
WIPP Waste Information System (WWIS)/Waste Data System (WDS)
Radiological Characterization/Dose-to-Curie (DTC)

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

Waste Isolation Pilot Plant Hazardous Waste Facility Permit, EPA ID.
NM4890139088-TSDF, New Mexico Environment Department

CBFO Quality Assurance Program Document, DOE/CBFO-94-1012

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

*Remote-Handled TRU Waste Characterization Program Implementation Plan,
DOE/WIPP-02-3214*

*CCP Transuranic Waste Characterization Quality Assurance Project Plan
, CCP-PO-001*

CCP Transuranic Waste Certification Plan, CCP-PO-002

Related technical and QA implementing procedures

2.2 Purpose

Audit A-12-10 was conducted to evaluate the adequacy, implementation, and effectiveness of BAPL/CCP waste characterization and certification activities for compliance with the requirements in the WIPP HWFP WAP, the CBFO QAPD, the WAC, and the RH TRU WCPIP.

3.0 AUDIT TEAM AND OBSERVERS

Auditors/Technical Specialists

Court Fesmire
Paul C. Gomez

Management Representative, CBFO
Audit Team Leader, CBFO Technical Assistance
Contractor (CTAC)

Katie Martin	Auditor, CTAC
Rick Castillo	Auditor, CTAC
Cindi Castillo	Auditor, CTAC
Jack Walsh	Auditor, CTAC
Porf Martinez	Technical Specialist, CTAC
Dick Blauvelt	Technical Specialist, CTAC (per telecom)
B. J. Verret	Technical Specialist, CTAC

Observers

Steve Holmes	New Mexico Environment Department (NMED)
Marcus Pinzel	CBFO Office of the National TRU Program (NTP)

4.0 AUDIT PARTICIPANTS

The individuals contacted during the audit are identified in Attachment 1. A pre-audit meeting was conducted in Carlsbad, NM, at the CBFO Skeen-Whitlock Building, room T224, on April 24, 2012. Daily meetings were conducted with management and staff to discuss audit progress, issues, and potential deficiencies. The audit concluded with a post-audit meeting conducted at the CBFO Skeen-Whitlock Building, room T224, on April 26, 2012.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy and Implementation

This audit was performed to assess the ability of the BAPL/CCP to characterize RH SCG S5000 debris waste for compliance with the requirements specified in the WIPP HWFP WAP, the WAC, the RH TRU WCPIP, and the CBFO QAPD. The characterization methods evaluated, as described in the body of this report, were AK, VE, HSG (sample collection), project-level V&V, and radiological characterization (DTC). Additionally, QA program elements within the HWFP WAP C6-1 checklist were evaluated, including nonconformance reporting, QA records, and personnel qualification and training.

The audit team concluded that the BAPL/CCP TRU waste characterization program is adequate, satisfactorily implemented, and effective. Attachment 1 lists the personnel contacted during the audit. Attachment 2 contains a summary table depicting the audit results. Attachment 3 lists the documents examined during the audit. Attachment 4 lists the processes and/or equipment evaluated during the audit.

5.2 General

5.2.1 Results of Previous Audits

The results of CBFO Certification Audit A-11-12 of the BAPL/CCP were examined. No CAQs were issued as a result of the referenced audit.

5.2.2 Changes in Programs or Operations

No changes in programs or operations have occurred since the previous audit (CBFO Certification Audit A-11-12).

5.2.3 New Programs or Activities Being Implemented

No new programs or activities have been implemented by the BAPL/CCP since the previous audit (CBFO Certification Audit A-11-12). All TRU waste characterization and certification activities have been completed.

5.2.4 Changes in Key Personnel

No changes in key personnel have been made by the BAPL/CCP since the previous audit (CBFO Certification Audit A-11-12).

5.3 Quality Assurance Activities

The following elements related to QA program implementation were evaluated by the audit team. Each QA element evaluated is discussed in detail below. The objective evidence compiled to assess compliance is briefly cited, along with the audit team's conclusions for each area evaluated.

5.3.1 Personnel Qualification and Training

The audit team interviewed responsible personnel and examined documentation to verify that BAPL/CCP adequately addresses and complies with the requirements in the HWFP WAP, the WAC, the CBFO QAPD, the RH TRU WCPIP, and CCP implementing procedures for personnel training and qualification.

Training and qualification records for the following positions were reviewed: RH waste acceptable knowledge experts(AKEs); QA engineers; RH waste site project managers (SPMs); HSG Summa[®] container sampling operators/independent technical reviewers (ITRs); DTC survey operators/ITRs; VE operators; and helium leak testing/transportation personnel. Record reviews also included visual examination expert (VEE) and subject matter expert/on-the-job training appointment letters.

Real-time radiography and VE personnel are required to be trained on newly developed and revised waste stream reports ONLY when changes are made to the report regarding (1) waste generating processes, (2) packaging, and (3) expected waste material parameters. Changes incorporated into the latest revision (Rev. 2) of CCP-AK-BAPL-500 did not affect the above-listed three elements; therefore, waste stream training was not required or conducted for CCP-AK-BAPL-500, Rev. 2.

No concerns were identified. Overall, the process and requirements for the qualification and training of personnel were determined to be adequate, satisfactorily implemented, and effective.

5.3.2 QA Records

The audit team interviewed responsible personnel and examined documentation to verify that BAPL/CCP adequately addresses and complies with the requirements in the HWFP WAP, the CBFO QAPD, the WAC, the RH TRU WCPIP, and CCP implementing procedures for the control of QA records. Evidence reviewed included personnel training and qualification records, characterization process batch data reports (BDRs), a sample of BAPL/CCP-generated records, and the BAPL/CCP Records Inventory and Disposition Schedule (RIDS).

The audit team conducted interviews and reviewed implementing procedures relative to the control and administration of QA records to determine the degree to which the procedures adequately address upper-tier requirements. The procedures review included CCP-PO-001, Rev. 20, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*; CCP-PO-002, Rev. 26, *CCP Transuranic Waste Certification Plan*; CCP-QP-008, Rev. 19, *CCP Records Management*; and CCP-QP-028, Rev. 14, *CCP Records Filing, Inventorying, Scheduling, and Dispositioning*. Control of QA records was verified through review of the CCP RH RIDS dated 8/15/2011. Three CAQs were identified during the record review portion of this audit relative to the accuracy and completeness of records in the areas of acceptable knowledge source documents and a headspace gas summary. The CAQs were resolved through the CDA process and the corrective actions were verified complete prior to the end of the audit (see section 6.2).

Concerns cited for the AK source documents in records were resolved during a briefing held April 25, 2012, after the management briefing. The AK management lead, the auditors who cited the concerns, the audit team leader (ATL), and the CBFO QA management representative attended the briefing. The first portion of the citing involved the numbering of documents in the source document record. Two documents in the same record each had two identification numbers. Agreement was reached when the AK management lead stated that the entire record across the complex will have various source document numbers for the same information. The ATL and CBFO QA management representative agreed that this is not an issue. A similar concern was cited for source document number U235 being identified as U135. The title in this document was the primary source of information. The AK management lead offered the same rationale, stating that site officials needed this document to be given a different number. The ATL and CBFO QA management representative agreed that this is not an issue. The next concern addressed source documents in the record files that are not listed in section 9.0 of the AK summary report. The AK management lead stated that there are several hundred extra documents that may not make the list in the summary report. The ATL and CBFO QA management representative agreed that this had no impact on the pertinent information in the summary report. The last concern cited was the recording of 13 of 91 instances in the records where the source document number

was not assigned. This issue was resolved with copies of the record reflecting the correct information, including information provided in electronic files. After noting that the titles of the documents matched, this concern was also determined to be a non-issue. The one remaining point was that the title to source document U397 did not match the title listed in section 9.0 of the AK summary report. This concern was corrected during the audit (CDA 1, see section 6.2).

A CAQ was identified regarding records associated with the Headspace Gas Summary for RH Lot 1, BT-T001. The SPM failed to sign pages 004, 010, and 011. This concern was corrected during the audit (CDA 2, see section 6.2).

Shipping BDRs for shipment numbers BAR11001, BAR11003, and BAR11005 were examined during this audit. Shipping data package preparation was complete. Independent Technical Review and Site Project Manager Review were performed as required. Leak test results were verified to be compliant, calibration of measuring and test equipment (M&TE) was checked and found to be acceptable, and entry of information into the WWIS/WDS system by the Waste Certification Official (WCO) was verified as acceptable.

While reviewing records, the audit team identified a deficiency on one of the leak test forms where the operator recorded the wrong year. CCP records personnel corrected the error by recording the correct year, re-reviewed and signed the form, and submitted the corrected form to CCP records (CDA 3, see section 6.2).

The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for QA records are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.3.3 Nonconformances

The audit team interviewed the project office QA Engineer/Nonconformance Report (NCR) Coordinator and reviewed all NCRs generated at BAPL/CCP from 2010 to the present. The following NCRs were reviewed to confirm that deficiencies are being appropriately documented and tracked through resolution, as required: NCR-RHBAPL-0001-10, NCR-RHBAPL-0200-10, NCR-RHBAPL-0300-11, NCR-RHBAPL-0501-11, NCR-RHBAPL-0502-11, NCR-RHBAPL-2143-11, NCR-RHBAPL-2453-11, NCR-RHBAPL-2454-11, and NCR-ALD-0500-11.

The audit team reviewed the BAPL/CCP NCRs and determined there were no reportable NCRs generated since the previous certification audit. All NCRs were verified as managed and tracked in the CCP Data Center, FTP site, and on the CCP NCR Logs. Additionally, the audit team reviewed the BAPL Data Generation Level and Project Level NCR Log Reconciliation Reports for 2011, and verified CCP complied with procedural requirements.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the

applicable requirements for nonconformances are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

Sample Control

The audit team interviewed personnel and reviewed documentation to verify that BAPL/CCP complies with the requirements of QAPD Section 4.1, *Sample Control*. Evidence of sample control was verified through the review of HSG sampling BDRs and associated chain-of-custody records.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for sample control are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

Control of Measuring and Test Equipment

The audit team interviewed personnel and reviewed documentation to verify that the BAPL/CCP complies with the requirements of QAPD Section 2.4.5, *Monitoring, Measuring, Testing, and Data Collection Equipment*. Evidence of control of M&TE was verified through review of certificates of calibration associated with instruments used during the collection of HSG samples.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for control of measuring and test equipment are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4 Technical Activities

Each technical area evaluated is discussed in detail in the following sections. Technical activities evaluated included data generation-level and project-level V&V, AK, HSG sampling, VE, WWIS/WDS, and radiological characterization (DTC). Since all characterization activities have been completed, the evaluations of activities were based on objective evidence collected and examined during the audit including AK summaries, source documents, BDRs, sampling records, and personnel training and qualification records.

Each characterization process involves:

- Collecting raw data
- Collecting quality assurance/quality control samples or information
- Reducing the data to a useable format, including a standard report
- Review of the report by the data generation facility and the site project office

- Comparing the data against program data quality objectives (DQOs)
- Reporting the final waste characterization information to WIPP

The flow of data for each characterization technique was reviewed to ensure that all applicable requirements were captured in the site operating procedures. Specific procedures audited, the objective evidence reviewed to assess compliance, and the audit team's conclusions for each area evaluated are briefly cited in the following sections.

5.4.1 Project-Level Validation and Verification

The audit team evaluated project-level V&V data collected as a result of the waste characterization implementing procedures. Objective evidence was reviewed as part of this assessment and was used in completion of Table C6-1, the WAP Checklist. The objective evidence included completed BDRs from the CCP SPM review of HSG sampling and analysis and VE. In addition, procedures and objective evidence were reviewed to ensure that BAPL/CCP could adequately perform data reconciliation and properly prepare a Waste Stream Profile Form (WSPF).

The flow of data from the point of generation to inclusion in the WSPF for each characterization technique was reviewed to ensure compliance with site operating procedures. The material in this section is also addressed in more detail in the following checklists, where the specific procedures audited and the objective evidence reviewed are identified.

Compliance with the project-level data V&V requirements of the HWFP WAP was evaluated through examination of the BDRs listed below. Some of the BDRs cited were used to demonstrate confirmation of AK, to reconcile DQOs, and to prepare a WSPF.

VE BDR:

RHBAPLVE100001

Headspace Gas Sampling and Analysis BDRs:

BAHSGS100001

ECL10037G

ECL10037M

Dose-to-Curie BDR:

BAPLRHDTTC11001

The Field Reference Standard results and quarterly repeat of data generation-level requirements for HSG sampling and VE were reviewed during the initial certification audit and determined to be acceptable. Additionally, a review was performed of the RH WSPF Characterization Information Summary for BAPL/CCP waste stream BT-T001.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for project-level data validation and verification are adequately

established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.2 Acceptable Knowledge

Evaluations were performed to verify compliance with the requirements for AK associated with the BAPL/CCP RH TRU waste stream designated as BT-T001. The results of the evaluations are documented on the WAP C6-3 checklist and in portions of the C6-1 checklist. Objective evidence was compiled and examined to verify compliance with each of the requirements during Audit A-11-12, and any updates since that initial certification audit are reported in these checklists. The team also reviewed AK documentation in relation to the requirements of the RH TRU WCPIP, Rev. 2, driven primarily by U.S. Environmental Protection Agency (EPA) requirements during Audit A-11-12. This inventory of RH TRU waste is expected to represent the final volume for this waste stream.

In addition to AK Summary Report CCP-AK-BAPL-500, Rev. 2, the audit team reviewed a freeze file of proposed changes for the next revision, a copy of the WSPF and attachments, and numerous relevant AK source documents to establish support for the conclusions noted in the AK Summary Report. The team also examined completed AK attachments prescribed by CCP-TP-005, *CCP Acceptable Knowledge Documentation*, addressing a crosswalk between the AK source documents and the WAP requirements during Audit A-11-12. These attachments included the Acceptable Knowledge Information List (attachment 4), Hazardous Constituents (attachment 5), Waste Form, Waste Material Parameters, Prohibited Items, and Packaging (attachment 6), and Waste Containers List (attachment 8).

The required traceability exercise was performed from all containers that have been completely through the characterization and certification process for VE, HSG, and DTC. The random selection memos for HSG sampling and analysis for Lot 1 were reviewed, along with the HSG summary reports for Lot 1, during Audit A-11-12. The team also examined copies of the AK Accuracy Report, AKE and SPM training records, copies of the Project-Tracking System database and the AK Tracking Spreadsheet, and the reconciliation of the characterization data with the AK record for the shipping lots, along with the requisite AK Characterization Checklists during Audit A-11-12.

Non-WAP-related checklists were used during the initial certification audit (A-11-12) to evaluate the requirements of the WCPIP, including the AK requirements, and the completion of a WCPIP WSPF, AK accuracy report, and characterization reconciliation reports (CRRs). The focus of the WCPIP requirements is upon physical and radiological properties and the absence of residual liquid in the waste. The audit team examined AK source documentation that supported these parameters in the AK Summary Report and in the CCP RH TRU Radiological Characterization Technical Report for this stream in CCP-AK-BAPL-501. The CRRs for each of the shipping lots were reviewed to assure that for each of the DQOs identified in the WCPIP, the supporting AK sources and methods of qualification of the data were appropriately identified and the relevant QA objectives were met.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for acceptable knowledge are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.3 Headspace Gas Sampling

Objective evidence was reviewed to evaluate compliance with HSG sampling requirements specified in the WIPP HWFP. BAPL/CCP collects HSG samples in SUMMA[®] canisters and ships the canisters to the Idaho National Laboratory (INL) for analysis. Evidence examined included HSG sampling BDR BAHSGS100001. The audit team reviewed documentation on the random selection of containers, drum age criteria, use of operational logbooks, sample chain-of-custody, certificates of calibration for M&TE, certificates of accuracy, and transfer to the analytical laboratory.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for headspace gas sampling are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.4 Visual Examination

The audit team evaluated BAPL/CCP capability to characterize SCG S5000 RH debris waste using the VE characterization method.

BAPL/CCP Procedures CCP-TP-500, Rev. 11, *CCP Remote-Handled Waste Visual Examination*, CCP-QP-002, Rev. 32, *CCP Training and Qualification Plan*, and CCP-PO-005, Rev. 22, *CCP Conduct of Operations*, were reviewed to ensure they adequately address the applicable requirements in the WIPP HWFP and the RH TRU WCPIP.

VE activities at BAPL have been completed for the RH waste stream evaluated during Audit A-11-12. Therefore, the audit team examined RH VE BDR RHBAPLVE100001 to verify implementation and compliance with the requirements for documenting VE activities as stipulated in CCP-TP-500.

The audit team reviewed training records for VE operators and verified that the required training and qualification had been achieved. Additionally, the audit team confirmed the appointment of the BAPL/CCP VEE in accordance with requirements.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for visual examination are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

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

The audit team evaluated the implementation of the CCP RH TRU Waste Certification and WWIS/WDS Data Entry procedure by observing the data entries using the WWIS/WDS data entry spreadsheet. The evaluation included data population of the spreadsheet, review of data entry by a Waste Certification Assistant, and waste certification by the WCO. Record reviews included container information summaries, pages from BDRs showing analyses values, WWIS/WDS container data reports, and submittals for WWIS/WDS review/approval.

The audit team reviewed one WWIS/WDS waste certification package for RH waste canister BE0003, which had three internal containers (HIP-41-27-14, HIP-41-05-13, and HIP-41-24-7), and one WWIS/WDS waste certification package for RH waste canister BE0004, which also had three internal containers (HIP-41-23-4, HIP-41-30-3, and HIP-41-32-6).

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for the WWIS/WDS are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

5.4.6 Radiological Characterization – DTC Methodology

The audit team assessed the adequacy, implementation, and effectiveness of the DTC methodology used by BAPL/CCP to characterize waste stream BT-T001, consisting of fifteen 55-gallon drums of RH TRU debris waste.

During Audit A-11-12 in April 2011, inventory information to support development of DTC scaling factors was presented for waste generated in the Bettis facility. The audit team previously evaluated the collection and analysis of swipe samples from the hot cell, the development of scaling factors that relate the measured dose rate to the average activity, and the actual measurement of the dose rate. There were no changes in any of these areas between the initial certification audit (A-11-12) and Audit A-12-10. 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).

Based on a review of the current revisions of CCP procedures and the data provided prior to and during the audit, a checklist was prepared and used to evaluate the following:

- Continued use of average radionuclide ratios previously developed through examination of swipe sample data
- Continued use of the previously approved relationship between the measured dose or exposure rate and the activity of Cs-137

- Measurement of the external dose or exposure rate of the waste containers
- Calculation of the radionuclide activities and other derived radiological quantities and associated uncertainties
- Results of applying the DTC methodology to characterize waste, as documented in BDR BAPLRHDTTC11001
- Determination of the number of containers examined, completed BDRs, and BDRs that had been through project-level review that were generated prior to this audit
- Completed BDRs to ensure data were reported and reviewed as required
- Data storage and retrievability
- Personnel qualification and training

As verified, prior to the certification audit, measurements of the external dose or exposure rates of the waste are made in a high-bay area of N Building. The exposure rate, attributed entirely to Cs-137, is measured four times at a distance of one meter from the 55-gallon waste containers. Auditors examined calibration records applicable to the dose rate measurement probes used at BAPL. Each container is successively rotated 90 degrees between each of the four measurements. The average measured dose or exposure rate for each 55-gallon waste container and associated scaling factors are used to estimate the activity of individual radionuclides and other derived radiological quantities and associated uncertainties.

The audit team interviewed DTC personnel and examined electronic and paper copies of reports and records. Since the previous audit (A-11-12), one BDR was completed for a total of 15 containers. Sampling BDRs BARH10001 and BARH10003 were examined during this audit. Chain-of-custody and sample labels were verified to be compliant. Sampling data package preparation was complete. Independent Technical Review and Site Project Manager Review was performed as required.

Analytical data packages ALD100052A and ALD100052A_SDP (supporting data package); ALD10053A and ALD10053A_SDP; ALD10054G and ALD10054G_SDP; and ALD10053I and ALD10053I_SDP; ALD10055B and ALD10055B_SDP; and ALD10052L and ALD10052L_SDP from CCP/INL were examined for Site Project Level Review, which was properly performed. Analysis of samples by CCP-INL is not in the scope of this audit.

No concerns were identified during the audit. The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for radiological characterization are adequately established for compliance with upper-tier requirements, satisfactory in the implementation of these requirements, and effective in achieving the desired results.

6.0 CORRECTIVE ACTIONS, OBSERVATIONS, AND RECOMMENDATIONS

6.1 Corrective Action Reports

During the audit, the audit team may identify conditions adverse to quality (CAQs) and document such conditions on corrective action reports (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 Quality Assurance (QA) program.

No CAQ necessitating the generation of a CAR was identified during the course of this audit.

6.2 Deficiencies Corrected During the Audit

During the audit, the audit team may identify CAQs. The audit team members and the ATL 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, determines if the CAQ is an isolated case requiring only remedial action and therefore can be corrected during the audit. Upon determination that the CAQ is isolated, the audit team member, in conjunction with the ATL, 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 ATL categorizes the condition as corrected during the 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.

Three CDAs were identified as a result of the audit and ordered as received.

CDA 1

The title of the source document U397 did not reflect the title listed in Section 9.0 of the AK Summary Report. A freeze file has been issued to reflect the correct title of the AK source document in the AK Summary Report. The audit team verified the freeze file contained the corrected title prior to the end of the audit.

CDA 2

It was identified during the audit that the Headspace Gas Summary for Remote-Handled Lot 1 BT-T001, the SPM failed to sign pages 004, 010, and 011. The deficiency was corrected and the audit team verified the records were correct and complete prior to the end of the audit.

CDA 3

It was identified that an incorrect year was recorded on attachment 7 of Shipping BDR BAR11001. The error on attachment 7 was corrected and the audit team verified the correction. The attachment was resigned and re-reviewed, and entered into records prior to the end of the audit.

6.3 Summary of Observations and Recommendations

During the audit, the audit team may identify potential problems or suggestions for improvement that should be communicated to the audited organization. The audit team member, in conjunction with the ATL, evaluates these conditions and classifies them as Observations or Recommendations using the following definitions.

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

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.

6.4 Observations

No Observations were documented as a result of this audit.

6.5 Recommendations

No Recommendations were presented to BAPL/CCP management for consideration as a result of this audit.

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: Listing of Processes and/or Equipment Reviewed

SUMMARY TABLE OF AUDIT RESULTS

Area/Activity	Concern Classification				QA Evaluation		Technical
	CARs	CDAs	Obs	Rec	Adequacy	Implementation	Effectiveness
Headspace Gas Sampling (HSG)					A	S	E
Visual Examination (VE)					A	S	E
Project Level Data Validation and Verification (PL V&V)					A	S	E
Quality Assurance – C6		2			A	S	E
Dose-to-Curie (DTC)					A	S	E
Acceptable Knowledge (AK)					A	S	E
Transportation		1			A	S	E
TOTALS		3			A	S	E

Definitions

E = Effective

S = Satisfactory

I = Indeterminate

M = Marginal

U = Unsatisfactory

CAR = Corrective Action Report

CDA = Corrected During Audit

EP = Exemplary Practice

NE = Not Effective

Obs - Observation

Rec = Recommendation

A = Adequate

NA = Not Adequate

**BETTIS ATOMIC POWER LABORATORY
 CENTRAL CHARACTERIZATION PROJECT
 TABLE OF AUDITED DOCUMENTS
 Audit A-12-10**

No.	Procedure Number	Rev	DOCUMENT TITLE
1.	CCP-AK-BAPL-500	2	Central Characterization Project Acceptable Knowledge Summary Report for Bettis Atomic Power Laboratory
2.	CCP-AK-BAPL-501	1	Central Characterization Project Remote-Handled Transuranic Radiological Characterization Report for Remote-Handled Transuranic Debris Waste from the Bettis Atomic Power Laboratory (BAPL)
3.	CCP-AK-BAPL-502	1	Central Characterization Project Remote-Handled Transuranic Waste Certification Plan for 40 CFR Part 194 Compliance and Confirmation Test Plan for Bettis Atomic Power Laboratory
4.	CCP-PO-001	20	CCP Transuranic Waste Characterization Quality Assurance Project Plan
5.	CCP-PO-002	26	CCP Transuranic Waste Certification Plan
6.	CCP-PO-008	9	CCP Quality Assurance Interface with the WTS Quality Assurance Program
7.	CCP-PO-505	1	CCP Remote-Handled Transuranic Waste Authorized Methods for Payload Control (CCP RH-TRAMPAC)
8.	CCP-QP-002	32	CCP Training and Qualification Plan
9.	CCP-QP-005	20	CCP TRU Nonconforming Item Reporting and Control
10.	CCP-QP-008	19	CCP Records Management
11.	CCP-QP-021	7	CCP Surveillance Program
12.	CCP-QP-028	14	CCP Records Filing, Inventorying, Scheduling, and Dispositioning
13.	CCP-TP-001	19	CCP Project Level Data Validation and Verification
14.	CCP-TP-002	24	CCP Reconciliation of DQOs and Reporting Characterization Data
15.	CCP-TP-003	18	CCP Data Analysis for S3000, S4000, and S5000 Characterization
16.	CCP-TP-005	24	CCP Acceptable Knowledge Documentation
17.	CCP-TP-082	8	CCP Preparing and Handling Waste Containers for Headspace Gas Sampling
18.	CCP-TP-093	16	CCP Sampling of TRU Waste Containers
19.	CCP-TP-106	7	CCP Headspace Gas Sampling Batch Data Report Preparation
20.	CCP-TP-162	1	CCP Random Selection of Containers for Solids and Headspace Gas Sampling and Analysis
21.	CCP-TP-163	3	CCP Evaluation of Waste Packaging Records for Visual Examination of Records
22.	CCP-TP-180	2	CCP Analytical Sample Management
23.	CCP-TP-500	11	CCP Remote-Handled Waste Visual Examination
24.	CCP-TP-504	11	CCP Dose-to-Curie Survey Procedure for Remote-Handled Transuranic Waste
25.	CCP-TP-506	2	CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report
26.	CCP-TP-507	7	CCP Shipping of Remote-Handled Transuranic Waste
27.	CCP-TP-509	3	CCP Remote-Handled Transuranic Container Tracking
28.	CCP-TP-530	10	CCP RH TRU Waste Certification and WWIS/WDS Data Entry
29.	WP 13-QA.03	19	Quality Assurance Independent Assessment Program

List of Processes and/or Equipment Reviewed

WIPP #	Process/Equipment Description	Applicable to the Following Waste Streams/Groups of Waste Streams	Currently Approved by NMED	Currently Approved by EPA
APPROVED PROCESSES OR EQUIPMENT				
BAPL/CCP Audit A-12-10 Remote Handled (RH) S5000 debris waste				
N/A	Acceptable Knowledge (AK) Procedure – CCP-TP-002 & CCP-TP-005	Debris (S5000)	Yes	Yes
19RHVE1	Visual Examination (VE) Procedure – CCP-TP-500	Debris (S5000)	Yes	Yes
19DTC1	Radiological Characterization (DTC) Procedure – CCP-TP-504	Debris (S5000)	N/A	Yes
N/A	Headspace Gas Sampling Procedure – CCP-TP-093	Debris (S5000)	Yes	N/A
N/A	Data Generation and Project Level Validation & Verification (V&V) Procedure – CCP-TP-001	Debris (S5000)	Yes	Yes
N/A	WIPP Waste Information System (WWIS/WDS) Procedure – CCP-TP-530 and CCP-TP-507	Debris (S5000)	Yes	Yes
N/A	Quality Assurance	N/A	N/A	Yes