DATE: October 25, 2019

REPLY TO: CBFO:OQA:ARS:JM:19-1080:UFC 2300.00

ATTN OF: CBFO:OQA:ARS:JM:19-1080:UFC 2300.00

SUBJECT: Interim Audit Report Recertification Audit A-19-26, of the Advanced Mixed Waste Treatment Project (AMWTP)

TO: Mr. Jim Malmo, DOE-ID


The audit team concluded with the exception of Acceptable Knowledge (AK) for Summary Category Group (SCG) S4000, that, overall, the AMWTP technical and quality assurance (QA) processes evaluated for characterizing SCG S3000 homogeneous solids, SCG S4000 soils/gravels and SCG S5000 debris waste were adequately established for compliance with applicable upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. Since there are no completed Enhanced AK Products and no AK Summary Report for waste stream ID-SDA-SOIL from the CH S4000 soils/gravel SCG, the AK for that SCG is deemed indeterminate.

The audit team identified six concerns during the audit. Two concerns were classified as conditions adverse to quality documented on corrective action reports (CARs); one of the concerns was classified as an observation; and three concerns were offered to management as recommendations.

If you have questions concerning the Audit Report, please contact me at (575) 234-7372.

Attachment
cc: w/attachment
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D. Pruitt, DOE-ID  ED
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G. White, CTAC  ED
Site Documents
CBFO QA File
CBFO M&RC
*ED denotes electronic distribution
U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

INTERIM AUDIT REPORT

OF THE

ADVANCED MIXED WASTE TREATMENT PROJECT

FOR

TRU WASTE ACTIVITIES
AT
IDAHO FALLS, IDAHO

AUDIT NUMBER A-19-26

September 23 – 26, 2019

Prepared by: Dustin Stegman, CTAE
Audit Team Leader

Approved by: Donald C. Gadbury, Director
CBFO Office of Quality Assurance

Date: 10-15-19

Date: 10-25-19
1.0 EXECUTIVE SUMMARY

U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) Recertification Audit A-19-26 was performed to evaluate the continued adequacy, implementation, and effectiveness of established programs for transuranic (TRU) waste characterization activities performed for the Advanced Mixed Waste Treatment Project (AMWTP). 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. 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), and the Waste Isolation Pilot Plant Documented Safety Analysis (DSA), Chapter 18.

Audit activities were conducted at the AMWTP Sawtelle Street facilities in Idaho Falls, Idaho (ID) and the AMWTP Idaho National Laboratory (INL) facilities on September 23 – 26, 2019. The audit team concluded that the AMWTP TRU waste characterization program procedures characterizing CH SCGs S3000 solids, S4000 soils/gravel, and S5000 debris wastes, adequately address upper-tier requirements. The processes for characterizing CH SCGs S3000 solids, S4000 soils/gravel, and S5000 debris wastes were satisfactorily implemented and effective in achieving the desired results. However, there were no completed Enhanced Acceptable Knowledge (AK) products and no AK Summary Report has been developed for waste stream ID-SDA-SOIL from the CH S4000 Soils/Gravel SCG; therefore, AK for SCG S4000 has been deemed indeterminate.

No WIPP HWFP Waste Analysis Plan (WAP)-affecting conditions adverse to quality (CAQs) or WAP-affecting Observations were identified during the audit. Two non-WAP-affecting CAQs were identified, resulting in the issuance of two corrective action reports (CARs) (see section 6.1.2). One non-WAP-affecting Observation was identified during the audit (see section 6.3.2), and three concerns 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 adequacy, implementation, and effectiveness of the technical and quality assurance (QA) activities performed by the AMWTP at INL for characterization of CH SCG S3000 solids waste, CH SCG S4000 soils/gravel waste, and CH SCG S5000 debris waste. 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
Generator Site Technical Review (GSTR) (non-WAP-related)

**WAP-Related Quality Assurance Activities**
- Personnel Qualification and Training
- Nonconformances (NCRs)
- Records

**Non-WAP-Related Quality Assurance Activities**
- AMWTP Organization and QA Program
- Procurement
- Graded Approach
- Reports to Management
- Document Control
- Corrective Actions
- Audits and Assessments
- Quality Improvement
- Measuring and Test Equipment (M&TE)
- Software Quality Assurance (SQA)

**WAP-Related Technical Activities**
- Acceptable Knowledge (AK)
- Project-Level Data Validation and Verification (PL V&V)
- Real-time Radiography (RTR)
- Visual Examination (VE)
- WIPP Waste Information System (WWIS)/Waste Data System (WDS)

**Non-WAP-Related Technical Activities**
- Nondestructive Assay (NDA), including Performance Demonstration Program (PDP)
- Container Management
- Load Management

The evaluation of the adequacy of AMWTP documents was based on current versions of the following documents:

- Waste Isolation Pilot Plant Hazardous Waste Facility Permit NM4890139088-TSDF
- DOE/CBFO-94-1012, *CBFO Quality Assurance Program Document* (QAPD)
- PLN-5199, *Quality Assurance Project Plan*
Programmatic and technical checklists were developed from current versions of the following documents:

- PLN-5198, Certification Plan for INL Transuranic Waste
- PLN-5199, Quality Assurance Project Plan
- Related AMWTP technical and QA implementing procedures

2.2 Purpose

Audit A-19-26 was conducted to evaluate the adequacy and effective implementation of program requirements for the characterization and certification of CH SCGs S3000 solids, S4000 soils/gravel, and S5000 debris wastes at the AMWTP for compliance with applicable upper-tier requirements.

3.0 AUDIT TEAM, MANAGEMENT REPRESENTATIVE, TECHNICAL SPECIALISTS, AND OBSERVERS

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Role</th>
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</thead>
<tbody>
<tr>
<td>Anthony Stone</td>
<td>CBFO Quality Assurance Management Representative</td>
</tr>
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<td>Dennis S. Miehls</td>
<td>CBFO Quality Assurance Management Representative</td>
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<td>Dustin Stegman</td>
<td>Audit Team Leader, CBFO Technical Assistance Contractor (CTAC) (Program Status)</td>
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<tr>
<td>Cindi Castillo</td>
<td>Auditor, Co-Team Leader, CTAC (Program Status)</td>
</tr>
<tr>
<td>Harley Kirschenmann</td>
<td>Auditor, CTAC (Organization/QA Program, Corrective Actions/NCRs, Procurement/Graded Approach)</td>
</tr>
<tr>
<td>B.J. Verret</td>
<td>Auditor, CTAC (Container Management, M&amp;TE, Instrumentation)</td>
</tr>
<tr>
<td>Charlie Riggs</td>
<td>Auditor, CTAC (C6 QA, Document Control, Records, Management &amp; Independent Assessments)</td>
</tr>
<tr>
<td>Porf Martinez</td>
<td>Auditor, CTAC (RTR)</td>
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<tr>
<td>Prissy Yanez</td>
<td>Auditor, CTAC (VE)</td>
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<tr>
<td>Kirk Kirkes</td>
<td>Auditor, CTAC (AK)</td>
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<tr>
<td>Steve Shafer</td>
<td>Auditor-in-Training, CTAC (AK)</td>
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<td>Bob Blyth</td>
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<td>David Guerin</td>
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<td>Randy Fitzgerald</td>
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<td>Paul Gomez</td>
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<tr>
<td>Dick Blauvelt*</td>
<td>Technical Specialist, CTAC (AK, Load Mgmt.)</td>
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<tr>
<td>Rhett Bradford</td>
<td>Technical Specialist, CTAC (VE)</td>
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<td>Shelly Martinez</td>
<td>Technical Specialist, CTAC (RTR)</td>
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<tr>
<td>Jim Oliver</td>
<td>Technical Specialist, CTAC (NDA/PDP)</td>
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</tbody>
</table>
Michel Hall
Technical Specialist, CTAC (NDA/PDP)
* Indicates team members working via telecom.

OBSERVERS

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Berta Oates
High Desert Consulting Services (Contractor to DOE-ID)

4.0 AUDIT MEETING ATTENDEES AND PERSONNEL CONTACTED

The audit meeting attendees and personnel contacted during the audit process are identified in Attachment 1. A pre-audit meeting was held on September 23, 2019, at the Sawtelle Street Facility in Idaho Falls, ID. Daily management briefings were held to update AMWTP management and staff on audit progress and identified concerns. A post-audit meeting was held on September 26, 2019, at the same location. Attachment 2 lists the AMWTP personnel contacted during the audit by subject area.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

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

Attachment 3 contains a summary table of audit results. Attachment 4 identifies the WAP-related objective evidence compiled (provided in boxes). Attachment 5 lists the audited procedures. Attachment 6 lists the processes and equipment evaluated. Attachment 7 contains the WAP-related procedure revision matrix.
The audit team concluded that, based on personnel interviews, observations of operations, and review of associated documentation and records, AMWTP TRU waste characterization program procedures characterizing CH SCGs S3000 solids, S4000 soils/gravel, and S5000 debris wastes, adequately address upper-tier requirements. The processes for characterizing CH SCGs S3000 solids, S4000 soils/gravel, and S5000 debris wastes were satisfactorily implemented and effective in achieving the desired results. However, there were no completed Enhanced AK products and no AK Summary Report has been developed for waste stream ID-SDA-SOIL from the CH S4000 soils/gravel SCG; therefore, AK for SCG S4000 has been deemed indeterminate.

5.2 General Activities

5.2.1 Results of Previous Audits

The audit team examined the results of the previous CBFO recertification audit of the AMWTP (A-18-04), wherein fourteen CAQs were identified. Seven CAQs resulted in the initiation of CARs 18-051, 18-052, 18-053, 18-054, 18-055, 18-056, and 18-057. CAR 18-054 was WAP-affecting. The other CAQs resulted in three Observations and four concerns were offered to management as Recommendations.

During the performance of this audit, the audit team verified sustained corrective actions and did not observe any similar instances to the CAQs identified during the previous recertification audit (A-18-04), suggesting that steps taken to address these issues were adequate in precluding recurrence.

5.2.2 Changes in Programs or Operations

The audit team determined through interviews with the AMWTP Site Project Manager (SPM) that there were no significant changes in programs or operations since the previous recertification audit (A-18-04).

5.2.3 New Programs or Activities Being Implemented

No new programs or activities have been implemented since the previous recertification audit (A-18-04).

5.2.4 Changes in Key Personnel

Changes in key personnel since the previous recertification audit (A-18-04) include the following:

- A Fluor Idaho employee has been appointed as a site liaison to improve communications between CBFO ONTP, DOE-ID, and Fluor.
5.2.5 Generator Site Technical Review (non-WAP-related)

The CBFO and Nuclear Waste Partnership (NWP), as WIPP HWFP co-permitees, performed Generator Site Technical Review (GSTR) ID-1-17-01, January 23 – 27, 2017, at the AMWTP in Idaho Falls, ID. The GSTR final report was issued on July 6, 2017 (CBFO:ONTP:CF:RMS:17-0674:UFC 5822.00). The GSTR team completed their review of the program, AMWTP satisfactorily addressed and resolved all of the identified issues related to the GSTR, and the GSTR closure letter was issued on October 6, 2017 (CBFO:ONTP:CF:RMS:17-2320:UFC 5900.00).

5.3 WAP-Related 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 verified that AMWTP met the requirements of the CBFO QAPD Section 1.2, Personnel Qualification and Training. The audit team conducted interviews with responsible personnel in the AMWTP Training Department. Implementing procedures were reviewed to determine the degree to which the procedures adequately address upper-tier requirements:

- MCP-33, Rev. 15, Personnel Qualification and Certification
- MCP-48, Rev. 15, Training Analysis, Design, Development and Release
- MCP-68, Rev. 6, Training Program Evaluation
- MCP-85, Rev. 17, Training Records Administration
- MCP-196, Rev. 18, Qualification of Auditors and Lead Auditors
- MCP-1309, Rev. 14, Inspection Personnel Certification
- PRD-4374, Rev. 2, WIPP Training Requirements Implementation Matrix

Review of the current implementing procedures confirmed that they adequately address upper-tier requirements.

Personnel training records associated with AK, NDA, RTR, VE, and PL V&V were examined to verify implementation of associated requirements and to verify personnel performing characterization activities were appropriately trained and qualified.

Record reviews provided evidence of AMWTP training program implementation. The audit team evaluated AMWTP qualification/qualification packages (qualification cards) and related individual training files for the various AMWTP positions through job analysis documentation and employee training history documentation from the Training
Records and Information Network (TRAIN) database. The team reviewed qualification packages for AK Experts (AKEs), NDA, RTR, VE, VE Experts (VEEs), Waste Certification Officials (WCOs) and SPMs. Documentation of waste stream training required for RTR and VE operators was evaluated, along with RTR operator training container (capability demonstration) documentation and eye examination forms. The audit team reviewed the TRU Programs and WIPP WAP Overview training module and the course report from the TRAIN database, indicating AMWTP personnel received the required training.

The audit team verified that access to computerized training records is controlled and personnel entering changes are authorized by the training manager/supervisor. Employee training files are stored on Electronic Document Management System (EDMS) and read/write access to the training folders on these systems is restricted. The audit team verified that a management assessment of the AMWTP training program was performed in July 2019.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for personnel qualification and training are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting, or non-WAP-affecting, concerns in the area of personnel qualification and training were identified.

5.3.2 Control of Nonconforming Items

The audit team verified that AMWTP met the requirements of the CBFO QAPD Section 1.3.2, Nonconformances. The audit team conducted interviews with representatives of the AMWTP QA organization. Implementing procedure MCP-538, Control of Non-Conforming Items, was reviewed to determine the degree to which the procedure adequately addresses upper-tier requirements. The audit team evaluated a random selection of nonconformance reports (NCRs) and observed AMWTP QA personnel demonstrate activities in the Issues Management System (IMS – TrackWise), to ensure nonconforming conditions were appropriately identified, documented, dispositioned, and tracked through closure. TrackWise is an integral part of the AMWTP QA Issues Management Program and allows readily available information to track issues through closure; initiate issues when identified; and prompt users to follow up on action items needed to correct and close issues.

The audit team examined a portion of AMWTP-related NCRs initiated between August 1, 2018 and August 31, 2019. There were three WIPP-related CH NCRs generated during that timeframe, requiring reporting to the CBFO. In addition, two NCRs not related to the AMWTP that identified nonconforming items identified during receipt inspection were examined to verify process adequacy. All were processed as required.

The audit team verified that AMWTP personnel are familiar with the process for identifying and processing NCRs. The NCRs examined were verified to have been entered, managed, and tracked to closure effectively using TrackWise.
The procedures reviewed and objective evidence assembled provided evidence 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 WAP-affecting or non-WAP-affecting concerns in the area of nonconformances were identified.

5.3.3 QA Records

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 1.5, Records, and evaluated the following AMWTP procedures to determine the degree to which the procedures adequately address upper-tier requirements:

- MCP-557, Rev. 20, Records Management
- MCP-2064, Rev. 6, Implementing Records Management Processes

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

AMWTP has implemented a uniform method for organizations and employees to manage records. General records management instructions are provided in procedure MCP-557. Records Management program processes for planning, identifying, categorizing, maintaining, and dispositioning records are specified in procedure MCP-2064.

The audit team reviewed a Training Course Report from the TRAIN database for 000ICP91, ICP Records General Awareness Training. All AMWTP organization employees and subcontractors are required to complete this training. The audit team verified AMWTP records management personnel are trained through completion of required reading for procedures MCP-557 and MCP-2064, as well as completion of course 00TRN900, Document Image and Electronic Record Processing.

The audit team interviewed Records Management personnel and observed records processing activities and determined that AMWTP record storage methods and records storage practices were in compliance with CBFO QAPD requirements. Records Management activities evaluated by the audit team included records custodian training, records receipt, identification, verification, validation, submittal, and records maintenance. The audit team reviewed a selection of record transmittals and receipt logs, and observed record indexing and a demonstration of a records search. The audit team reviewed Electronic System Record Storage Record Identification forms and Interim Record Holding System Approval forms, indicating records are adequately stored and maintained in approved electronic record repository applications.

The audit team conducted a walkthrough of the INL Site Records Center (ISRC) to verify organization, maintenance, storage, dispositioning, and retrievability of records. Access to the area is controlled through a posted access list of authorized personnel.
The audit team performed a review of sustained corrective actions from CBFO CAR 18-051, identified during CBFO Audit A-18-04, which identified that RTR characterization records had not been submitted to EDMS since 2016. The corrective actions included submitting the characterization records to EDMS and performing an investigation for similar conditions. The audit team verified the sustained corrective actions and did not observe any similar instances to the CAQ identified in CAR 18-051.

Lifetime and nonpermanent WIPP records are categorized and classified in Appendix B and Appendix C, respectively, of procedure MCP-2064. The audit team verified procedures are established to ensure that the generator/storage site maintains records that are designated as WIPP lifetime records for the life of the waste characterization program plus six years, or are transferred to the WIPP Records Archive (WRA). The team also verified the generator/storage site maintains records that are designated as WIPP nonpermanent records for ten years from the date of record generation, and are then dispositioned according to the approved schedule, or transferred to the WRA.

The procedures reviewed and objective evidence assembled and evaluated provided evidence that overall, the applicable requirements for records are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting or non-WAP-affecting concerns in the area of QA records were identified.

5.4 Non-WAP-Related Quality Assurance Activities

Each non-WAP-related QA 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 CBFO QAPD, WIPP WAC, or WIPP DSA, as applicable, is cited briefly; and the result of the assessment is provided.

5.4.1 AMWTP Organization/QA Program

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 1.1, Organization and Quality Assurance Program, and evaluated the following AMWTP procedures to determine the degree to which the procedures adequately address upper-tier requirements:

- PLN-5198, Rev. 3, AMWTP CH TRU Waste Certification Plan
- PLN-5199, Rev. 2, Quality Assurance Project Plan

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

The audit team interviewed AMWTP project and QA management personnel and reviewed the organizational structure to verify independence of the QA program from TRU waste characterization activities. The AMWTP QA Manager has the authority and overall responsibility to independently audit AMWTP’s implementation of the QA
Program to verify the achievement of quality. Quality is achieved and maintained by those assigned responsibility for performing work, and is verified by those not directly responsible for performing the work.

A reorganization of Environmental Safety Health and Quality during the past year combined Performance and QA organizations in a new directorate. Updated organization charts were issued. The results of the audit team's interviews and documentation review concluded that roles and responsibilities and QA requirements are understood and adequately implemented.

The Core Implementing Plan identifies the implementing procedures to satisfy the regulatory and QA requirements.

The CH-TRU Program Manager is responsible for providing adequate training for quality assurance and technical project personnel.

The AMWTP QA Program includes provisions for ensuring that participant employees have the responsibility for the quality of their work and promptly report potential CAQs. Employees are also responsible for issuing a stop work when dangerous or significant noncompliant conditions are observed.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for organizational/QA program implementation are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No non-WAP-affecting concerns in the area of organizational/QA program implementation were identified.

5.4.2 Graded Approach

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 1.1.2.3, Grading Items and Activities and Applying Management Controls, and evaluated the following AMWTP procedure to determine the degree to which the procedure adequately addresses upper-tier requirements:

- MCP-540, Rev. 25, Assigning Quality Levels

Results of the review indicate that the procedure adequately addresses upper-tier requirements. MCP-540 was submitted to, and approved by, the CBFO QA Director, on September 22, 2016.

The audit team performed a review of the Quality Level Determination (QLD) form and the software process of the QLD database in the EDMS, and verified that there was sufficient detail provided to understand the scope and boundaries of the identified system. Completion of the QLD form identifies the Quality Level after the Requester/Design Authority provides scope and boundary responses to the software process. Initial questions to be answered by the Requester/Design Authority relating to background information is provided by the software, including item or activity, Nuclear
Regulatory Commission (NRC) regulated item or activity, software or Waste-Acceptance-Impacting information. Completion of questions that follow relate to failure consequence level and failure potential level, which further defines the scope and boundaries that are evaluated by the QLD web based program. Results are developed by following the above process description. The results were deemed appropriate by the audit team.

A representative sample of QLDs were selected for review, and were found to adequately address in sufficient detail the scope and boundaries of the identified item/service.

Procedure MCP-540 implements the requirements of the QLD process by Requestor/Design authority review of the relevant factors to the QLD of items and services. Utilization of the QLD is used in the controlling documents of individual procedures for various processes, such as procurement and design control, to assure the proper quality requirements are applied.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for control of the graded approach are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No non-WAP-affecting concerns in the area of graded approach were identified.

5.4.3 Procurement

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 2.3, Procurement, and evaluated the following AMWTP procedures to determine the degree to which the procedures adequately address upper-tier requirements:

- MCP-4021, Rev. 2, Acquisition of Material and Services
- MCP-4022, Rev. 2, Material Management
- MCP-591, Rev. 27, Supplier Evaluation and Qualification

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

The audit team conducted interviews with responsible personnel, toured and inspected the Warehouse, and reviewed selected records to determine the degree to which the AMWTP program effectively implements the requirements for the quality program elements noted above.

The audit team selected a representative sample of procurement records packages generated since the previous CBFO Audit, A-18-04. The reviews specifically focused on adherence to program requirements for purchase requisitions and purchase orders, quality requirement specifications, supplier selection, procurement document review and approvals, supplier evaluation and procurement acceptance practices,
suspect/counterfeit inspection and warehousing controls of items. Responsible personnel in procurement and receipt inspection activities were determined to have been appropriately trained and qualified.

The personnel interviewed, documents reviewed, and the computer system evaluated during the audit provided evidence that the applicable requirements for procurement are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No non-WAP-affecting concerns were identified.

5.4.4 Corrective Action

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 1.3.3, Corrective Action, and evaluated the following AMWTP procedures to determine the degree to which the procedure adequately addresses upper-tier requirements:

- STD-1113, Rev. 8, Cause Analysis and Corrective Action Development

Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team reviewed Apparent Cause Analysis (ACA), Documented Cause Analysis (DCA), Formal Cause Analysis (FCA) and Corrective Action Plan (CAP) development documentation. All activities reviewed, including reporting requirements, were conducted in compliance with procedural requirements.

There were no revisions to procedure MCP-598 and no significant changes in personnel that process AMWTP related corrective actions made since the previous CBFO Audit (A-18-04). The audit team interviewed the AMWTP QA Program Manager and examined a representative sample of AMWTP-related corrective action reports for objective evidence.

A representative sample of training and qualification documentation for individuals performing corrective action activities was examined. All individuals were determined to be qualified to perform their role in the AMWTP corrective action process.

AMWTP CARs are processed using the AMWTP Issues Management System. Information generated outside of the Issues Management System that is pertinent to processing CARs is either entered into the Issues Management System or attached to the CAR record.

The majority of CARs examined were classified as non-significant CAQs. One CAR classified as a significant condition adverse to quality was examined. All CARs examined were processed in accordance with procedure MCP-598.

Corrective action program effectiveness is reported every six months by the AMWTP
QA Manager in QA program status reports to the TRU Programs Site Project Manager. No adverse trends were identified.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for developing cause analysis and corrective actions are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No non-WAP affecting concerns in the area of corrective action were identified.

5.4.5 Quality Improvement

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 1.3, Quality Improvement, and evaluated the following AMWTP procedure to determine the degree to which the procedure adequately addresses upper-tier requirements:

- MCP-598, Rev. 36, Corrective Action System.

Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team reviewed issues management activities (CAQs, NCRs, CARs and trend reports), as well as issue closures, queries, and reports in the TrackWise Issues Management System. All activities and documentation reviewed were conducted in compliance with procedural requirements.

Training records of personnel conducting Quality Improvement activities were reviewed and found to meet procedural requirements. QA Records are maintained as required in EDMS, an approved Interim Record Holding System (IRHS). The EDMS approval was reviewed and met all applicable requirements.

The procedures reviewed and objective evidence assembled and evaluated during the audit provided evidence that the applicable requirements for Quality Improvement are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No non-WAP-affecting concerns in the area of Quality Improvement were identified.

5.4.6 Document Control

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 1.4, Documents. The audit team evaluated the following AMWTP procedures to determine the degree to which the procedures adequately address upper-tier requirements:

- MCP-135, Rev. 45, Document Management
- WIP-5, Rev. 2, Obtaining DOE-ID and Carlsbad Field Office Review and Approval of WIPP Documents
Results of the review indicate that the procedures adequately address upper-tier requirements.

The audit team conducted interviews with document control personnel and observed activities for adherence to approved procedures. The audit team evaluated recently completed Document Change Requests (DCRs) and case files associated with current and revised work instructions and management procedures. Demonstrations of the EDMS allowed for the audit team to evaluate and verify performance of document issuance, validation, verification, and revision/changes. New procedures and revisions were properly reviewed, approved, and issued. The audit team verified procedures for format and content, including action steps, notes, hold points, verification, independent witness points, warnings, and cautions. The audit team verified that forms receive the same review as the implementing document, and that current forms are accessed through the EDMS. EDMS is the repository for electronic controlled copies of documents. A limited number of hardcopy documents are maintained as controlled copies. These are distributed from the Document Control office through a formal transmittal and receipt process.

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

5.4.7 Quality Trending - Reports to Management

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 1.3.3.9, Quality Trending. The audit team evaluated the following AMWTP procedure to determine the degree to which the procedure adequately addresses upper-tier requirements:

- MCP-4014, Rev. 2, Reports to Management

Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team reviewed the following completed Semi-Annual Reports to Management:

- CCN 323069 for July through December 2018 issued January 15, 2019
- CCN 323913 for January 1, 2019 through June 30, 2019 issued July 22, 2019

The reports detail Changes to Plans, Recommendations to QA/QC, NCRs, CAR and NCR Trends, Assessments of QC Data, Limitations, PDP Status, and Audits and Surveillances.
The audit team verified that the SPM performed a review of the reports and commented as necessary. Further, it was verified that a copy of the report is provided to Document Control, DOE-ID, and the AMWTP Program Manager. The report is scanned and entered into the EDMS for document enquiries.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for reports to management are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No non-WAP-related concerns in the area of reports to management were identified.

5.4.8 Inspection and Testing (Control of Measuring and Test Equipment for Data Collection)

The audit team verified that AMWTP complies with the requirements of the CBFO QAPD Section 2.4, Inspection and Testing. The audit team evaluated the following AMWTP procedures to determine the degree to which the procedures adequately address upper-tier requirements:

- MCP-4023, Rev. 1, Measuring and Test Equipment Program;
- MCP-6303, Rev. 6, Calibration of Installed Facility Process and Control Instrumentation
- TPR-7998, Rev. 2, Calibration and Control of Measuring and Test Equipment

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

The audit team interviewed personnel and reviewed the applicable AMWTP procedures for the established methods and processes to calibrate and control both Measuring and Test Equipment (M&TE) and in-plant and process instrumentation. In general, M&TE is calibrated by an approved calibration facility. In-plant and process instruments undergo calibration and/or functional checks performed using M&TE at prescribed intervals using approved procedures. Each item of M&TE has a unique number for identification and accurate tracking.

Records of both M&TE calibrations and in-plant and process instrumentation checks are maintained in the Computerized Maintenance Management System (CMMS) in the Maximo database. Multiple records for M&TE and in-plant and process instruments were reviewed using CMMS. Interviews were also conducted to verify adequate implementation of the site tool crib and in-plant instrumentation.

The audit team verified sustained corrective actions from CBFO CAR 18-052 from Audit A-18-04, pertaining to items on the CMMS Inventory List that indicated availability, but
were actually retired from service. Sustained corrective actions were verified to preclude recurrence.

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

5.4.9 Audits/Surveillance/Assessments

Audits

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 3.2.2, Audits. The audit team evaluated the following AMWTP procedure to determine the degree to which the procedure adequately addresses upper-tier requirements:

- MCP-9278, Rev. 12, Quality Assurance Audits

Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team reviewed the current AMWTP audit schedule. Four audits were conducted during the second half of fiscal year 2019, and two audits were in process, scheduled to be completed by the end of fiscal year 2019. The majority of oversight activities is accomplished through surveillances and management assessments. The objective evidence reviewed confirmed that QA audits are conducted in compliance with procedural requirements.

Training records for personnel conducting QA audits were reviewed and found to meet procedural requirements. QA records are maintained as required in EDMS. The EDMS approval was reviewed and met all applicable requirements.

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

Surveillances

The audit team verified that AMWTP meets the requirements of CBFO QAPD Section 3.2.1, Surveillances. The audit team evaluated the following AMWTP procedure to determine the degree to which the procedure adequately addresses upper-tier requirements:

- MCP-589, Rev. 16, Quality Assurance Surveillance
Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team reviewed the current AMWTP surveillance schedule (August 1, 2018 to present) and completed surveillance reports to ensure surveillances were scheduled, planned, and performed; results evaluated and corrective action taken as necessary. Training records of personnel conducting surveillances were reviewed and found to meet procedural requirements. QA records are maintained as required in EDMS. The EDMS approval was reviewed and met all applicable requirements.

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

Management Assessments

The audit team verified that AMWTP meets the requirements of the CBFO QAPD Section 3.1, Management Assessments. The audit team evaluated the following AMWTP procedure to determine the degree to which the procedure adequately addresses upper-tier requirements

- MCP-8, Rev. 16, Self Assessments

Results of the review indicate that the procedure adequately addresses upper-tier requirements.

The audit team reviewed the current AMWTP management assessment schedule and completed management assessment reports to ensure management assessments were scheduled, planned, and performed; results evaluated and corrective action taken as necessary. Management assessment reports for the QA Manager’s effectiveness review of corrective actions for significant CAQs were also reviewed and found to meet procedural requirements.

Training records of personnel conducting management assessments, issue identification and corrective action activities were reviewed and found to meet procedural requirements.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for management assessments are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No non-WAP-related concerns in the area of management assessments were identified.
5.4.10 Software Quality Assurance

The audit team reviewed AMWTP procedures with respect to requirements of the CBFO QAPD Section 6, *Software Requirements*. The audit team evaluated the following AMWTP procedures to determine the degree to which the procedures adequately address upper-tier requirements:

- MCP-3996, Rev. 4, *Software Quality Assurance*
- MCP-3997, Rev. 2, *Software Version Control*
- MCP-3998, Rev. 7, *Software Inventory Classification*
- MCP-3999, Rev. 4, *System Data Change Request*
- MCP-4000, Rev. 2, *Class III Software Change Requests*
- MCP-4001, Rev. 3, *Temporary Software Override*
- MCP-9600, Rev. 0, *AMWTP Change Control*
- MCP-9609, Rev. 0, *AMWTP Facility Modification Proposal Preparation*
- WIP-1, Rev. 1, *TRU Waste Certification*

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

The audit team evaluated the implementation of the AMWTP Software Quality Assurance (SQA) process. The evaluation included interviews with personnel and examining SQA work activity. AMWTP personnel demonstrated system software known as Helix application. The Helix application is used for software configuration and change management and the approval process. Software testing, installation, release control, and retirement is controlled through the Helix application. The audit team interviewed the Integrated Control System (ICS) Lead and verified that system change requests (SCRs) and temporary software overrides (TSO) are initiated, developed, and tested. In addition, the audit team verified that software impact analysis, unresolved safety questions, and abnormal or infrequent issues are generated per procedural requirements.

The audit team reviewed the inventory baseline to confirm it was updated, and that software data change requests (SDCRs) were initiated, reviewed by system administrator, and approved by a Cognizant System Engineer (CSE) per procedural requirements.

The audit team reviewed test reports, test cases, SDCRs, TSOs, software parameter updates (SPUs), SCRs, SCR release documentation, software change screenings, SQA plans, and software change impact analyses. Details of SCRs were reviewed from printed electronic record documents. Details of configuration control of software code modules were reviewed for the Polytronic Version Control System (PVCS) used to
control AMWTP programming code. User access permission and assigned user roles were utilized to track and manage software changes and check-in/check-out software code modules for modification or installation.

The audit team reviewed the generation and management of facility modification proposals (FMPs) and determined that review and approval of FMPs are performed in accordance with procedural requirements. The FMPs were reviewed by and contained signatures of operations, QA, and SQA personnel. These approvals are adequately documented from inception to resolution of a proposed system modification. The facility modifications are also reviewed and approved by the applicable cognizant system engineer. The coordination of software changes with facility modifications was reviewed and determined to be adequately managed and documented.

Involvement of appropriate departments in the generation, review, approval, implementation, and closure of software changes, data changes, parameter updates, facility changes, and temporary software overrides are adequate and satisfactorily documented.

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

5.5 WAP-Related 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.

5.5.1 Table C6-1, WAP Checklist

The C6-1 WAP Checklist addresses general program requirements from an overall management perspective. The general requirements checklist addresses both technical requirements and specific WIPP HWFP WAP-related QA programmatic requirements that, when collectively implemented, ensure effective overall management of TRU waste characterization activities. Requirements are integrated into controlled documents to ensure the waste characterization strategy, as defined in the WAP, is accomplished and documented in accordance with controlled processes and procedures.

Technical elements evaluated for waste characterization activities consisted of DGL and PL V&V, AK, RTR, VE, WWIS/WDS, and preparation of WSFs. Objective evidence was selected and reviewed to evaluate the implementation of the associated waste characterization activities. BDRs, sampling records, and personnel qualification and training documentation were included in the evaluation. Where possible, the audit
included direct observation of actual waste characterization activities. Each characterization process involves:

- Collecting raw data
- Collecting QA/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 DQOs
- Reporting the final waste characterization information to the WIPP

The flow of data from the point of generation to inclusion in the WSPF for each waste characterization technique was reviewed to ensure that all applicable requirements were captured in the site operating procedures. The specific procedures audited and the objective evidence reviewed are described in the following sections.

During the audit, AMWTP demonstrated compliance with the waste characterization requirements of the WAP through documentation and by performing characterization activities.

**Project-Level Data Validation and Verification (PL V&V)**

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 adequately address upper-tier requirements:

- PLN-5198, Rev. 3, *AMWTP CH TRU Waste Certification Plan*
- PLN-5199, Rev. 2, *Quality Assurance Project Plan*

Procedures used during the Project Level review include:

- WIP-1, Rev. 1, *TRU Waste Certification*
- WIP-2, Rev. 3, *Level I Data Validation*
- WIP-3, Rev. 0, *Level II Data Validation*
- WIP-4, Rev. 0, *Data Reconciliation*
- WIP-7, Rev. 1, *Preparation of Waste Stream Profile Forms*

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

The audit team verified that SPMs who conducted work for AMWTP were appropriately trained and qualified as required by MCP-33, Rev. 15, *Personnel Qualification and Certification*. 
The audit team evaluated the following BDRs in support of CH waste characterization activities completed at the AMWTP to verify that PL V&V activities are performed in compliance with applicable procedural requirements:

**RTR**
- RTR18-00045
- RTR18-00051
- RTR19-00007
- RTR19-00015
- RTR19-00022

**VEA**
- VEA18-00015
- VEA18-00013
- VEA19-00070
- VEA19-00079
- VEA18-00061
- VEA19-00045

**VEB**
- VEB18-00717
- VEB19-00103
- VEB19-00246
- VEB19-00220
- VEB18-00733

**VEP**
- VEP18-00039
- VEP18-00080
- VEP18-00077
- VEP18-00061
- VEP18-00066

**VNC**
- VNC18-00003
- VNC19-00001

**NDA**
- ASY18-01963
- ASY18-01969
- ASY18-02002
- ASY18-02257
- ASY19-01001
- ASY19-01275
- ASY19-00223
- ASY19-00685
- BSY19-00097
- BSY19-00038
- BSY17-00126
- BSY18-00052

The BDRs were verified to be complete and accurate, and were found to be in compliance with all applicable procedural requirements.

- The audit team verified that the WSPF was properly completed with a Characterization Information Summary (CIS). The WSPF and CIS was reviewed for the following: Waste Stream AMWTP RPT-TRUW-09, Rev. 11, Acceptable Knowledge Summary for First/Second Stage Sludge (BNINW216)
- Waste Stream AMWTP RPT-TRUW-83, Rev. 12, Acceptable Knowledge Summary for Supercompressed Debris Waste

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

- ICP Surveillance Report – 116268 for VEB18-00570 completed 10/03/2018 for 3rd Quarter 2018
• ICP Surveillance Report – 122147 for RTR18-00040 completed 10/03/2018 for 3rd Quarter 2018
• ICP Surveillance Report – 122148 for RTR18-00053 completed 01/30/2019 for 4th Quarter 2018
• ICP Surveillance Report – 122149 for VEB18-00704 completed 01/30/2019 for 4th Quarter 2018
• ICP Surveillance Report – 116270 for VEB19-00055 completed 02/11/2019 for 1st Quarter 2019
• ICP Surveillance Report – 116271 for RTR19-00010 completed 07/18/2019 for 2nd Quarter 2019
• ICP Surveillance Report – 122150 for RTR19-00001 completed 02/11/2019 for 1st Quarter 2019
• ICP Surveillance Report – 122157 for VEB19-00215 completed 08/08/2019 for 2nd Quarter 2019

The results were completed for the listed reports and no issues were reported.

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, are satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting or non-WAP-affecting concerns in the area of PL V&V were identified.

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

The audit team conducted interviews and reviewed implementing procedure WIP-1, *TRU Waste Certification*, relative to the CBFO QAPD Section 2.1, *Work Processes*, and WWIS/WDS data entry process 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 evaluated the implementation of WWIS/WDS procedure specific to data entry, waste characterization, and waste certification using the AMWTP EDMS and the Waste Tracking System (WTS) software application. Waste management activities include implementation of the Waste Container Data Entry Form (WCDEF) and the Offsite Shipping Module (OSM) within the AMWTP WTS. The audit team conducted a review of documentation for the data entry process, and observed demonstrations of data entry, data review, and data submittal using the OSM waste certification method. Documentation of waste certification using the WCDEF method was also reviewed. Demonstrations were conducted and waste container certifications were presented by AMWTP WCOs.
The audit team reviewed WCDEF and OSM data reports, WWIS/WDS Container Data Reports, and review of electronic container information summaries and electronic BDRs that presented waste characterization analytical values used in the data entry and verification process. The audit team observed a demonstration of data entry, container characterization, and a container certification submittal into WWIS/WDS. Data collection, container characterization, and container certification using the OSM method is a fully electronic means, including interface with analytical equipment software applications and electronic promotion and reviewed in WTS and WWIS/WDS. Verification of waste characterization analytical values in the OSM is performed electronically within WTS. BDRs and characterization and certification data forms are reviewed and compared electronically. The AMWTP WTS is used to electronically manage and track NCRs associated with containers being characterized and certified. Verification of resolution of NCRs associated with specific containers is performed electronically within the AMWTP WTS. The OSM characterization and certification method is the primary method in use. Electronic access of enhanced AK information that supports container characterization and certification was also demonstrated by the AMWTP WCO.

The audit team reviewed WWIS/WDS waste certification packages for CH waste containers for 10060731 and 10034452, WSPF BN510.4, and Chemical Compatibility Evaluation (CCE) BN1NW218. These containers provided evidence using either the WCDEF method or the OSM certification method, demonstrating flammable gas analysis and data entry performed by NWP Central Characterization Program (CCP) on behalf of AMWTP for subsequent certification of the container by AMWTP. The audit team determined that waste certification and documentation of characterization and certification activities for both the WCDEF and OSM methods are adequately performed including data entry, data entry review, and certification of waste containers.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for WWIS/WDS data entry were adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting or non-WAP-affecting concerns in the area of WWIS/WDS were identified.

**Load Management**


The audit team examined waste stream BN1NW216 which is payload managed (as described in RPT-TRUW-09, Rev. 11, *Acceptable Knowledge Summary for First/Second Stage Sludge [BN1NW216]*). The containers from BN1NW216 are assayed and can be overpacked into a standard waste box such that the payload container is
calculated to be less than 100 nanocuries per gram (nCi/g). Estimates of the amount of waste greater than, and less than 100nCi/g are provided as required with supporting documentation available in RPT-TRUW-07, Rev. 22, Determination of Radioisotopic Content in TRU Waste Based on Acceptable Knowledge.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for load management are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting or non-WAP-affecting concerns in the area of load management were identified.

5.5.2 Table C6-2, Acceptable Knowledge Checklist

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 adequately address upper-tier requirements:

- MCP-8, Rev. 16, Self-Assessments
- MCP-538, Rev. 30, Control of Non-Conforming Items
- WIP-6, Rev. 0, Collection, Review, and Management of Acceptable Knowledge Documentation
- WIP-7, Rev. 1, Preparation of Waste Stream Profile Forms
- WIP-9, Rev. 1, Preparation of Chemical Compatibility Evaluation and Basis of Knowledge Assessment
- TPR-7997, Rev. 7, Visual Examination Operations at RWMC
- TPR-8041, Rev. 8, Visual Examination Operations

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

The audit team members examined the AK record for waste streams from CH SCG S5000 Debris and S3000 Solids. With regard to CH SCG S4000 Soil/Gravel, there is one AMWTP CH S4000 waste stream, ID-SDA-SOIL. There is currently no AK Summary Report associated with this waste stream. Further, no enhanced AK products have been developed; therefore, AK for CH SCG S4000 is deemed indeterminate.

The audit team performed a review of the AK record and compiled objective evidence demonstrating compliance with all applicable AK requirements from both the WIPP WAP and the WIPP WAC. The two waste streams examined during the audit included the CH SCG S5000 debris stream, BN510.4, described in AK Summary RPT-TRUW-83,
Rev. 12, AK Summary Report for the Supercompacted Debris Waste (510.4), and the CH SCG S3000 solids stream, BNINW216, described in RPT-TRUW-09, Rev. 11, Acceptable Knowledge Summary for First/Second Stage Sludge (BNINW216). These AK Summary Reports document information that addresses the waste stream-specific requirements of the WAP. The corresponding documentation of the WAP programmatic requirements for these two waste streams are found in generator site AK documents: RPT-TRUW-06, Rev. 18, Acceptable Knowledge Document for AMWTP Waste, and RPT-TRUW-56, Rev. 7, AK Document for INL Stored TRU Waste-Rocky Flats Plant, respectively. A review of these AK documents demonstrated that the WAP programmatic and waste stream-specific requirements are met. Objective evidence was compiled that demonstrates compliance with the WAP requirements including Form 1066 (FRM-2182) TRU Waste Management Checklist, and Form 1067 (FRM-2457) TRU Waste Stream AK Documentation Checklist. These forms provide a crosswalk between the WAP requirements and specific AK Source Documents that address the requirement.

In addition to the AK Summary Reports and generator site AK documents noted above, the audit team performed a review of RPT-TRUW-12, Rev. 25, ICP TRU Waste Stream Designations, RPT-TRUW-05, Rev. 45, Waste Matrix Code Reference Manual, and RPT-TRUW-07, Rev. 22, Determination of Radioisotopic Content in TRU Waste Based on Acceptable Knowledge. The audit team examined AK discrepancy resolution documentation for discrepancies in the AK record and discrepancies identified during RTR. The audit team also reviewed NCRs dealing with the identification and remediation of prohibited items. Documentation of electronic holds on non-compliant containers was also examined.

The audit team verified that all waste has been assigned an IDC based upon available AK information. A compilation of these IDCs is found in RPT-TRUW-05, Waste Matrix Code Reference Manual, Rev. 45. There are a total of 126 IDCs for debris waste from both onsite and offsite generators that are approved as feedstock into the supercompaction process that yields approved waste stream BN510.4. There was discussion regarding the role that the Sludge Repackaging Project (SRP) will play when it resumes operation following relocation of the operation. The SRP may involve treatment of sludges that cannot be direct shipped and may also involve the treatment of TRU soil prior to repackaging.

The AK audit team examined, as part of the established audit scope, several revisions of TPR-8040, Rev. 20, Boxline Operations. This procedure is being used to treat liquid squeezants by absorption prior to their reentry into the supercompaction process. Previous versions were reviewed based on a start date for this activity sometime in the first quarter of 2018. It was determined that this procedure directs the use of the appropriate amount of an approved absorbent to properly treat squeezants introduced into the boxline trough.
Numerous documents from the AK record demonstrate compliance with applicable requirements previously referenced in the report. The WSPFs and attachments were reviewed and compiled as objective evidence and included the reconciliation of DQOs for the two waste streams (ID-SDA-SOIL and BN510.4). The auditors examined or reexamined a large number of AK Source Documents and AK Source Document Summaries from which the AK is derived along with the latest version of the AK Document Reference Inventory, a complete listing of all AK Source Documents for AMWTP waste streams, and the latest AK Accuracy Reports.

With regard to the status of the development of enhanced AK products, the audit team examined the most recent enhanced AK products for the waste streams reviewed. A summary of the products reviewed is described below.

**Interface Waste Management Documents List (IWMDL)**

There were no IWMDLs available for the waste streams examined. Tracking of current waste management activities and the addition of containers covered by requisite AK Assessments are addressed in AKA Addendums.

**Chemical Compatibility Evaluation (CCE)**

Two Chemical Compatibility Evaluation Memorandum’s (CCEMs) and supporting documentation were examined during this audit. The first CCEM reviewed was written and approved for the entire BNINW216 waste stream. The CCEM was applied to all waste containers in this waste stream including those containers at the INL that have not yet been certified. The CCEM was examined during the previous audit. During the audit process, it was noted that an additional 31 chemicals had been identified after CBFO approval was granted. Subsequently, guidance was issued by CBFO and an addendum to this CCEM was issued. The auditors reviewed the addendum for compliance.

The second CCEM examined was for waste streams BN510, 510.1, 510.2, 510.3 and 510.4 from supercompaction. This CCEM is distinguished by an Attachment 4, *BN510 Waste Streams Insignificant Trace Chemicals/Materials*. Supporting documentation reviewed and compiled as objective evidence includes comments or document review records (DRRs) from internal reviews, CBFO reviews, and CBFO approval documentation.

**Acceptable Knowledge Assessment (AKA)**

The AK audit team examined several AK Assessments (AKAs) during this audit that represented the following waste stream subpopulations:

- The BNINW216 Lot 3 certified but not shipped subpopulation at the INL; and
- The BN510.4 Lot 3 certified but not shipped subpopulation at the INL.
Each of the AKAs for these waste stream subpopulations identified relevant historic and current waste management practices, absorbents and neutralization agents utilized and listed specific waste containers to which the AKA applied. Supporting AK documentation in the form of review comments from the SPM and the Site Management Representative (SMR) were collected as objective evidence.

Basis of Knowledge (BoK)

Basis of Knowledge (BoK) memoranda were reviewed for the following waste stream subpopulations:

- The BNINW216 Lot 3 certified but not shipped subpopulation at the INL.

The BoK memorandum was examined with regard to the response to every criterion identified in the BoK procedure for waste at the generator sites. Supporting documentation in the form of review checklists and BoK review comments were compiled.

In addition to the BoK noted above, the audit discussed with the author, a BoK memorandum for BN510.4 for the waste containers listed in the AKA for BN510.4 Lot 3. Although verbal approval has been received from the CBFO reviewers, a formal acceptance letter has not been received; therefore, the BoK was not available for review.

Acceptable Knowledge Briefings

The requirements for conducting an AK briefing in AMWTP WIP-6 are as follows:

A. When the AK summary report is revised due to changes in the waste stream characteristics or packaging configuration.

B. As requested by the SPM or SMR when generation of waste varies in characteristics or packaging configuration.

There has been one AK Summary Report revision since the last audit, RPT-TRUW-09 R11. The AK auditors reviewed that AK Briefing along with the attendance list.

Traceability

A total of nine drums were tracked for the WAP-required traceability exercise including four product drums from BN510.4 at the INL, four drums from BNINW216 at INL, and one drum from the ARP Soil waste stream ID-ARP-SoIL. In addition to reviewing the relevant VE, RTR and NDA characterization BDRs, the audit team also compiled traceability screenshot data from the waste tracking system (WTS). The auditors also reviewed several data reconciliation packages for the traceability containers that reconciled characterization data with requisite AK information.
With regard to the QA aspects of the AK portion of the audit, the audit team reviewed the training records and qualification cards for five AKEs and one SPM for AMWTP. All were found to be current in their qualifications. The audit team reviewed NCRs and AK Resolutions (Forms 1070 and 2184) to ensure a process was in place to resolve IDC assignments, impenetrable containers, Low Level Waste determinations, and prohibited items. The audit team reviewed the handling of AK records for compliance with preparation, legibility, accuracy, review, approval, and maintenance requirements. The distribution, control and use of appropriate AK procedures was reviewed. The audit team also reviewed the AK Audit Report IAS 18335 conducted by AMWTP QA from July 30 thru August 6, 2019. The team evaluated upper-tier requirements, documents, records, and training.

The AK team identified one concern. On Attachment 4, CCEM for BNINW216 [CCN 319981, dated July 20, 2017, p. 22], Waste Stream BNINW216 Insignificant Trace Chemicals/Materials, SP-400 (acrylic resin) references footnote “k”, in “Justification & Assumptions” which states, “Magnesium oxide is only slightly soluble in water so it will not be present in any considerable quantity in the aqueous sludge.”

The correct footnote reference should be footnote “o” which states, “Although the Drill and Drain process was included in the AK for this waste stream in preparation for beginning the process, it was discontinued after making only 2 containers that were never added to this waste stream. Therefore SP-400 is not in this waste stream.” (See Recommendation 1 in section 6.4.)

With the exception of the non-WAP-affecting concern identified, the procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for AK are adequately established. For the waste streams containing CH SCGs S3000 solids and S5000 debris waste reviewed by the audit team, all elements of Enhanced AK were verified to be implemented. The information provided demonstrated that the AK process was satisfactorily implemented and effective in achieving the desired results. There were no completed Enhanced AK products and no AK summary report for ID-SDA-SOIL from the CH SCG S4000 Soils/Gravel; therefore, the AK for that SCG is deemed indeterminate. No WAP-affecting concerns in the area of AK were identified.

5.5.3 Table C6-3, Radiography Checklist

The audit team evaluated the adequacy, implementation, and effectiveness of the AMWTP RTR characterization process for SCGs S5000 debris waste, S4000 soil/gravel, and S3000 homogeneous solids.

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

• MCP-33, Rev. 15, Personnel Qualification and Certification
• MCP-135, Rev. 45, *Document Management*
• MCP-538, Rev. 30, *Control of Non-Conforming Items*
• MCP-557, Rev. 20, *Records Management*
• MCP-598, Rev. 36, *Corrective Action System*
• MCP-2980, Rev. 8, *Logkeeping*
• MCP-4023, Rev. 1, *Measuring and Test Equipment Program*
• PLN-5198, Rev. 3, *AMWTP CH-TRU Waste Certification Plan*
• PLN-5199, Rev. 2, *Quality Assurance Project Plan*
• PRD-4374, Rev. 2, *WIPP Training Requirements Implementation Matrix*
• TPR-8089, Rev. 6, *Real-Time Radiography Examinations (Certification Scans)*
• WIP-2, Rev. 3, *Level I Data Validation*

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

AMWTP has three RTR units; Z-213-101, Z-213-106, and unit RTR-1001. RTR unit Z-213-106, located in building WMF-634 was not being utilized during the audit. RTR unit RTR-1001, located in building WMF-610 is no longer used to perform certification scans.

The team interviewed RTR personnel, verified the equipment was operational, and verified the use of the most current operating procedures and AK summary documents. AMWTP uses RPT-TRUW-05, *Waste Matrix Code Reference Manual*, as their AK reference to confirm the assigned IDC is correct.

RTR operations were observed on RTR unit Z-231-101 for the Image Quality Indicator (IQI) and characterization scan of container #10667330, BDR #RTR1900028, SCG S5000 debris waste from Item Description Code (IDC) AW-167. All operations were performed with approved procedures. The audit team also verified the IQI was reviewed by the facility shift supervisor as required. RTR units Z-213-101 and Z-213-106 contained the components required by the WAP to effectively characterize the CH SCG wastes subject to the scope of the audit. The audit team also examined RTR operational logbook entries in the electronic login system (eSOMS) for RTR unit Z-231-101 to verify logbook entries were correct and reviewed by the facility shift supervisor as required.

The audit team evaluated RTR operator training documentation. The audit team examined training records for three RTR operators and determined they were appropriately trained and qualified for compliance with training requirements. The training files for each of the RTR operators included an annual record of eye
examination, RTR Operator/Independent Technical Review (ITR) qualification card, and
documentation/required read & signs for current AK summary reports. The team
evaluated the RTR operator required training container documentation, along with the
corresponding audio/video media for two qualified operators. AMWTP has a training
container representing waste from all SCGs S3000 Homogeneous Solids, S4000,
Soil/Gravel and S5000 debris wastes.

During the review of training container documentation, associated work orders, and
audio/video media, the audit team identified three concerns. The first concern identified
that there was no objective evidence provided for a Waste Matrix Code (WMC) being
associated with training containers. RTR Operators are currently not identifying the
WMC of training containers on the data forms as required in Appendix F of the WIPP
WAC (see CAR 19-077 in section 6.1).

The second concern was also in the area of the training container. The RTR SME is the
point of contact when providing instructions associated with the construction of a
training container. The work order examined by the audit team referenced a specific
individual. In addition, instructions in work orders for building/reconfiguring training
containers need to be more specific when reconfiguring a training container. The audit
team observed minimal changes to items in the work order for the construction of the
training container. For example, containers with liquids have not been changed, only
rearranged in the training container. RTR Operators need be able to identify containers
with items (including prohibited items) common to the waste streams to be
characterized and internal containers of various sizes. These conditions may cause
RTR operators to routinely identify known liquid amounts, which if not corrected, may
lead to a condition adverse to quality (see Observation # 1 in section 6.3).

The third concern was in the area of the semiannual reconfiguration of training
containers. RTR training containers are required to be reconfigured semiannually. The
training container evaluated was reconfigured on February 19, 2019. This training
container has not been reconfigured again in 2019. A work package was initiated to
reconfigure the container. The audit team recommends that an action item be placed in
TrackWise to notify the RTR SME when to construct the next training container (see
Recommendation # 2 in section 6.4).

The audit team examined BDRs and audio/video media for selected containers within
the following RTR BDRs:

<table>
<thead>
<tr>
<th>RTR18-00043</th>
<th>RTR18-00051</th>
<th>RTR19-00007</th>
<th>RTR19-00015</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTR18-00045</td>
<td>RTR18-00052</td>
<td>RTR19-00008</td>
<td>RTR19-00019</td>
</tr>
<tr>
<td>RTR18-00048</td>
<td>RTR19-00004</td>
<td>RTR19-00009</td>
<td>RTR19-00022</td>
</tr>
<tr>
<td>RTR18-00049</td>
<td>RTR19-00006</td>
<td>RTR19-00010</td>
<td></td>
</tr>
</tbody>
</table>

One concern was identified during the review of RTR BDRs. Frequently, RTR operators
do not agree with the IDC assigned to the waste being examined. When this happens,
the RTR operator recommends an IDC change that is relayed to the AKE. The AKE
may agree or recommend another IDC. When the AKE recommends another IDC, the instruction to perform rework are given to the RTR operator to make the change. There are no procedural steps in TPR-8089, Rev. 6, *Real-Time Radiography Examination (Certification Scans)* to describe the actions taken by the RTR Operator when performing rework to confirm the waste stream description as provided by the AK summary report (see CAR 19-078 in section 6.1).

The audit team also verified sustained corrective actions for CBFO CARs 18-051 and 18-055 identified during the previous recertification audit (A-18-04). Sustained corrective actions were verified to preclude recurrence.

With the exception of the four non-WAP-affecting concerns noted above, the procedures reviewed, field observations, and objective evidence assembled provided evidence that the applicable requirements for RTR characterization of CH SCGs S3000 solids, S4000 soil/gravel, and S5000 debris waste are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting concerns in the area of RTR were identified.

5.5.4 Table C6-4, Visual Examination Checklist

The audit team evaluated the adequacy, implementation, and effectiveness of AMWTP VE characterization process for CH SCG S3000 solids, S4000 soils/gravel, and S5000 debris waste.

The audit team reviewed the following AMWTP procedures to determine the degree to which the procedures adequately address upper-tier requirements:

- MCP-33, Rev. 15, *Personnel Qualification and Certification*
- TPR-7997, Rev. 7, *Visual Examination Activities At RWMC*
- TPR-8040, Rev. 20, *Boxline Operations*
- TPR-8041, Rev. 8, *Visual Examination Operations*
- WIP-2, Rev. 3, *Level 1 Data Validation*

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

The audit team toured the North Box Lines and interviewed the VE operators and the VEE. The audit team observed VE operations of container #10672955 from SCG S5000 debris waste from IDC 508.

The audit team also toured the ARP facility in building WMF-1621 and observed VE of container #10672706, SCG S4000 soil/gravel waste from IDC 706. AMWTP uses RPT-TRUW-05, *Waste Matrix Code Reference Manual*, as their AK reference to confirm the assigned IDC is correct. The logbooks for the North and South Box Lines and the ARP
VIII facility were logged correctly and were reviewed by the Vendor Project Manager (VPM) as required. The team verified the following items of M&TE used during VE:

- Torque wrench 730837 calibration due date - 10/18/2019
- Torque wrench 724694 calibration due date - 10/18/2019
- Scale 724386 calibration due date - 11/27/2019
- Scale 724677 calibration due date - 11/27/2019

The audit team examined the following VE Batch Data Reports:

| VEA19-00045 | VEB19-00010 | VEP18-00039 |
| VEA19-00058 | VEB19-00071 | VEP18-00059 |
| VEA19-00070 | VEB19-00103 | VEP18-00061 |
| VEB18-00555 | VEB19-00169 | VEP18-00074 |
| VEB18-00587 | VEB19-00174 | VEP18-00080 |
| VEB18-00664 | VEB19-00199 | VEP18-00083 |
| VEB18-00733 | VEB19-00220 | VNC18-00003 |
| VEB18-00717 | VEB19-00356 | VNC19-00001 |

The audit team examined training records for VE operators/ITRs and confirmed the appointment letters of AMWTP VEEs. The audit team verified that VE operators/ITRs and the VEEs were appropriately qualified as required.

The audit team identified one concern during the audit. It was recommended that the language in procedure TPR-8040, Rev. 20, Boxline Operations, be clarified to identify which port the squeezants are processed through (see section 2.9 and Appendix D verses section 4.10) (see Recommendation 3 in section 6.4). The audit team verified the two concerns from the previous audit (A-18-04) were adequately addressed. Sustained corrective actions were verified to preclude recurrence.

With the exception of the one non-WAP-affecting concern, the procedures reviewed, field observations, and objective evidence assembled provided evidence that the applicable requirements for VE characterization of CH SCG S5000 debris, S4000 soils/gravel, and S3000 solids waste are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting concerns in the area of VE were identified.

5.6 Non-WAP-related Technical Activities

Each non-WAP-related 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 CBFO QAPD, WIPP WAC, or WIPP DSA, as applicable, is cited briefly; and the result of the assessment is provided.
5.6.1 Nondestructive Assay

The audit team evaluated the continued adequacy, implementation, and effectiveness of the following NDA systems:

- Integrated Waste Assay Systems (IWAS) designated as Z-390-100 and Z-390-101
- NDA systems in building WMF-676, also IWAS, designated as Z-211-102 and Z-211-103
- NDA systems in building WMF-634, Retrieval Box Assay System (RBAS), designated as Z-212-105
- Waste Assay Gamma Spectrometer (WAGS) also in building WMF-634
- SWEPP (Stored Waste Examination Pilot Plant) Gamma-Ray Spectrometer (SGRS), also in building WMF-634
- Two In-Situ Object Counting Systems (ISOCS), designated as Z-295-100/200 and Z-295-101/201

CBFO previously evaluated these systems during Audit A-18-04 in August of 2018.

The Z-390-100 and Z-390-101 systems are capable of assaying waste in 55-gallon drums, while the Z-211-102 and Z-211-103 systems are capable of assaying waste in both 55 and 83/85 gallon drums. The RBAS is capable of assaying boxes with a maximum dimension of 98" X 58.5" X 78." Boxes assayed may include Standard Waste Boxes (SWBs), Standard Large Boxes 2 (SLB2s), and Fiber Reinforced Plywood (FRP) boxes or their custom equivalents. The WAGS and SGRS can only assay 55-gallon drums.

The Z-390-100 and Z-390-101 units are located inside the AMWTP processing facility where waste is sorted and delivered to the supercompactor. These units therefore see only SCG S5000 waste. The RBAS is capable of assaying both S3000 and S5000 SCG’s, but has not been used to assay S3000 waste. The Z-211-102, Z-211-103, WAGS and SGRS have seen waste from all approved SCGs.

The IWAS NDA systems are Canberra multi-mode hybrid systems that run on NDA 2000 and incorporate Canberra’s Genie 2000, Multi Group Analysis (MGA), as well as Multi-Group Analysis-Uranium (MGA-U), when sufficient quantities of uranium are detected or anticipated based on AK. Each IWAS system consists of the following components:

- Two broad energy germanium (BEGe) gamma detectors mounted one over the other in the assay chamber wall, perpendicular to, and pointing toward the vertical axis of the drum;
- An array of 122 Helium-3 (He-3) proportional tubes arranged in a 4π geometry around the assay chamber. These tubes are divided into 16 detector banks
currently only used in the passive neutron coincidence counting mode. These systems have the capability (both qualified and maintained) to assay in the active neutron differential die-away (DDA) mode. Active mode was not used for WIPP assay purposes since the last audit;

- A Cf-252/Cs-137 Add-A-Source (AAS) correction source, mounted in a retractable housing external to the assay cavity, with an intensity of approximately 105 neutrons per second is used, in part, for the determination of matrix correction factors (MCF); and

- A 14 MeV neutron generator with a capability of producing 108 14-MeV neutrons per second can be used, along with cavity and barrel flux monitors and four Fast Neutron Detector Packs (FNDP), in the active neutron DDA mode.

The RBAS is an imaging passive/active neutron system supplemented with a High Purity Germanium (HPGe) gamma system. The measurement techniques used with the box assay system are passive neutron multiplicity counting, imaging active neutron counting using thermal and epithermal DDA techniques, and high-resolution gamma isotopic analysis. The integrated information from the neutron measurements, gamma-ray measurements, and AK are used to determine the isotopic distribution, quantify the radionuclide masses, and compute the associated derived quantities (Plutonium Equivalent Curies [PECi], the Plutonium equivalent Fissile Gram Equivalents [FGE], the total TRU Alpha Activity, and the decay heat) for each waste box.

Once a box is loaded onto the RBAS loader/turntable, the system feeds the box fully into the RBAS where the gamma measurement is taken. The box is then conveyed to the middle section of the unit where banks of Helium-3 detectors count the passive neutrons emitted by the waste and a neutron source is directed through the box to allow for the measurement of moderating and absorbing characteristics of the waste and correct for waste matrix effects. The neutron detectors also count the neutrons that are emitted actively in response to the source to perform the DDA analysis. The box is measured in segments as it passes through the area of detectors and the interrogating source. Once the full length of the box has passed through this region, the loader/turntable unloads the box, rotates it 180 degrees and repeats the entire measurement.

The RBAS uses PC-FRAM (Fixed-energy Response function Analysis with Multiple efficiencies) for the isotopic analysis of the gamma spectra. Integration of FRAM results and RBAS neutron results is performed using off-line software known as RBAS WIPP Analysis Reporting Software for Expert Analysis (RWARS-EA).

The SGRS and WAGS are both gamma spectrometers with multiple high-resolution Broad Energy Germanium (BEGe) detectors. The WAGS uses six such detectors divided into two vertical banks of three detectors each. One bank is positioned opposite a set of three Ba-133 sources. These detectors are calibrated, based on a density correction obtained from the Ba-133 transmission, to quantify gamma-emitting radionuclides using the Canberra MGA software. The second bank of three BEGe
detectors uses cadmium filters to attenuate low energy gamma rays, thus reducing dead time and increasing measurement resolution. The spectra obtained from these detectors are used to determine the relative isotopic ratios of gamma-emitting radionuclides. The SGRS differs from the WAGS in that it does not use a transmission source to perform a density correction. The SGRS utilizes four BEGe detectors that each acquires a gamma spectrum. The four spectra are then summed and corrected using a multi-curve correction that was developed during system calibration. This multi-curve correlates detector efficiency with waste density and gamma energy. Once the spectra are corrected, the same Canberra MGA software is used to quantify the individual radionuclides present.

For the ISOCS systems, the different number designations indicate whether the system is being used to characterize drummed waste (the 100 and 101 designations) or boxed waste (the 200 and 201 designations). The Z-295-100/200 instrument was previously equipped with a Low Energy Germanium (LEGe) detector (S/N 8753) and a laptop computer (WTSL295100). Since the last audit, the detectors has been replaced with a Broad Energy Germanium (BEGe) detectors making the Z-295-100/200 unit functionally identical to the Z-295-101/201 unit. The Z-295-101/201 instrument contained two Broad Energy Germanium (BEGe) detectors (S/N 8149 and 8151) and a laptop computer (WTSL295101).

The ISOCS systems are capable of assaying waste in a wide variety of containers as there are no limitations imposed by assay chambers or fixed calibration geometries. Waste containers include:

- 55-Gallon drums
- 83/85 Gallon drums
- 100 Gallon puck drums
- 110 Gallon drums
- Low Level Waste Export Boxes
- Shredder Boxes
- Standard Large Box 2 Assembles
- Standard Waste Boxes
- Fiberglass Reinforced Packages
- M-III bins
- Various other container geometries as long as those geometries have been properly modeled and input into the ISOCS modeling system.

Additionally, and of important note, the mobile nature of the ISOCS systems differentiates them from the other NDA systems evaluated at AMWTP. The CBFO has experience with other ISOCS systems that are integral parts of the Mobile ISOCS Large Container Counters (MILCCs) found at Oak Ridge National Laboratory (ORNL) and LANL. Similar to the systems at ORNL and LANL, the ISOCS units at AMWTP will be
routinely repositioned in order to properly orient the detectors relative to waste containers and to compensate for effects such as high gamma containers that could cause excessive dead time in detectors. AMWTP may choose to reposition the ISOCS detectors; however, they must meet the applicable WIPP WAC requirements to account for location specific effects of measurements including all effects of background radiation and the presence of any materials that could affect the energy and profile of measured gamma rays (e.g., attenuators or reflectors.)

Based on a review of the current revisions of AMWTP procedures and reports provided prior to and during the audit, checklists were prepared and used to evaluate the following:

- System stability as evidenced by the implementation and effectiveness of daily and weekly measurement controls and calibration verifications;
- Applicability of each system's calibration and operational range to the matrix, geometry and radionuclide content of waste assayed since Audit A-18-04;
- Successful participation in the CBFO-sponsored NDA PDP Cycle 26A and B18A;
- Completed BDRs to ensure data are reported and reviewed as required;
- Data storage and retrievability;
- Personnel qualification and training; and
- Continued operability and condition of the NDA systems since Audit A-18-04.

The audit team interviewed AMWTP NDA personnel and operations staff, observed equipment operations and practices, and examined electronic and paper copies of records, including BDRs, control charts, NCRs, and work orders. No system recalibrations have been required or performed on the assay systems since Audit A-18-04 and the system performance checks have been performed as required. AMWTP successfully participated in PDP cycle 26A for 8 drum systems (4 IWAS units, the two SGRS, the WAGS, and the 2 ISOCS systems and box cycle B18A for the RBAS and two ISOCS).

The audit team specifically reviewed the following documents/procedures:

**IWAS**

- CI-IDN-0055, Rev. 1, *Total Measurement Uncertainty for the AMWTP Integrated Waste Assay System*
- TPR-7994, Rev. 2, *Drum Assay Post-Maintenance Calibration and Verification*
- TPR-8025, Rev. 7, *In-Plant Drum Assay Operations*
- TPR-8094, Rev. 4, Drum Assay Operations

RBAS

- BII-5112-TMU-001 Rev. 2, AMWTP Retrieval Box Assay System (RBAS) Total Measurement Uncertainty Report
- PSC-5431-CCR-001, Rev. 0, 1, and 2, RBAS Calibration Confirmation Reports
- PSC-5431-SADD-001 Rev. 10, System and Algorithm Definition Document
- PSC-5431-SADD-002 Rev. 3, System and Algorithm Definition Document
- TPR-8095, Rev. 7, Box Assay Operations
- TPR-7995, Rev. 3, Box Assay Post-Maintenance Calibration and Verification

SGRS

- CCP-INL-SGRS-001, Rev. 2, SWEPP Gamma-Ray Spectrometer(SGRS) Calibration, Confirmation, and Verification Report
- CCP-INL-SGRS-0002, Rev. 0, Total Measurement Uncertainty for the SGRS Assay System
- TPR-7996, Rev. 2, Waste Assay Gamma Spectrometer/ SWEPP Gamma-Ray Spectrometer Post-Maintenance Calibration and Verification
- TPR-8092, Rev. 5, Stored Waste Examination Pilot Plant Gamma-Ray Spectrometer Operations

WAGS

- CCP-INL-WAGS-001, Rev. 1, Waste Assay Gamma Spectrometer (WAGS) Calibration, Confirmation, and Verification Report
- CCP-INL-WAGS-002, Rev. 0, Total Measurement Uncertainty for the WAGS System
- CCP-INL-WAGS-003, Rev. 0, Waste Assay Gamma Spectrometer (WAGS) Calibration, Confirmation, and Verification Report
- CCP-INL-WAGS-08-002, Rev. 0, Calibration Extension Addendum for the Waste Assay Gamma Spectrometer Operated by the Central Characterization Project at the Idaho National Laboratory
- TPR-7996, Rev. 2, Waste Assay Gamma Spectrometer/ SWEPP Gamma-Ray Spectrometer Post-Maintenance Calibration and Verification
- TPR-8093, Rev. 4, Waste Assay Gamma Spectrometer Operations
ISOCS

- 10000008684, Rev. 1, ISOCS Calibration, Confirmation and Verification Report (including Attachments 1-6)
- 10000008737, Version 1.12.8, Total Measurement Uncertainty for ISOCS
- TPR-8182, Rev. 3, ISOCS Technical Operations
- TPR-8184, Rev. 1, ISOCS Post-Maintenance Calibration and Verification

The following drum assay BDRs were reviewed during the audit:

**Z-390-100 IWAS**

- ASY18-01964  ASY18-01967  ASY18-02002  ASY18-02127
  ASY18-02251  ASY18-02294  ASY18-02340  ASY18-02360
  ASY18-02410  ASY18-02448  ASY18-02486  ASY18-02525
  ASY18-02548  ASY19-00019  ASY19-00020  ASY19-00047
  ASY19-00088  ASY19-00124  ASY19-00158  ASY19-00220
  ASY19-00243

**Z-390-101 IWAS**

- ASY18-02487  ASY18-01961  ASY18-01976  ASY18-01995
  ASY18-02053  ASY18-02097  ASY18-02142  ASY18-02257
  ASY18-02318  ASY18-02365  ASY18-02419  ASY18-02455
  ASY18-02542  ASY19-00005  ASY19-00016  ASY19-00034
  ASY19-00055  ASY19-00086  ASY19-00126  ASY19-00142
  ASY19-00175  ASY19-00223  ASY19-00258  ASY19-00309
  ASY19-00381  ASY19-00470  ASY19-00584  ASY19-00685
  ASY19-00708  ASY19-00735  ASY19-00756  ASY19-00782
  ASY19-00823  ASY19-00864  ASY19-00966  ASY19-00990
  ASY19-01009  ASY19-01027  ASY19-01041  ASY19-01057
  ASY19-01078  ASY19-01136  ASY19-01168  ASY19-01219
  ASY19-01248-2 ASY19-01258-2 ASY19-01272-2 ASY19-01303-2
  ASY19-01326-2 ASY19-01348-2 ASY19-01370-2 ASY19-01391-2

**Z-211-102 IWAS**

- ASY19-00870  ASY18-02029  ASY18-02078  ASY18-02080
  ASY18-02106  ASY18-02156  ASY18-02157  ASY18-02237
  ASY18-02287  ASY18-02336  ASY18-02562  ASY18-02563
  ASY19-00949  ASY19-00973  ASY19-01001  ASY19-01010
  ASY19-01285  ASY19-01286  ASY19-01336
Z-211-103 IWAS

- ASY18-02281 ASY18-01988 ASY18-02027 ASY18-02077
  ASY18-02079 ASY18-02155 ASY18-02240 ASY18-02242
  ASY18-02302 ASY18-02398 ASY19-00450 ASY19-00499
  ASY19-00689 ASY19-01092 ASY19-01158 ASY19-01181

SGRS

- ASY19-00209 ASY18-02113 ASY18-02120 ASY18-02126
  ASY18-02131 ASY18-02177 ASY18-02182 ASY18-02259
  ASY18-02311 ASY18-02343 ASY18-02367 ASY18-02392
  ASY18-02428 ASY18-02447 ASY18-02526 ASY18-02529
  ASY19-00218 ASY19-00352 ASY19-00406 ASY19-00487
  ASY19-00488 ASY19-00544 ASY19-01248 ASY19-01258
  ASY19-01272 ASY19-01303 ASY19-01326 ASY19-01348
  ASY19-01370 ASY19-01391

WAGS

- ASY19-00603 ASY19-00974 ASY19-00996 ASY19-01048
  ASY19-01071 ASY19-01081 ASY19-01177 ASY19-01201

The following box assay BDRs were reviewed during the audit:

RBAS

- BSY15-00004 BSY17-00054 BSY17-00126 BSY17-00148
  BSY18-00052 BSY18-00242 BSY19-00038 BSY19-00097

Z-295-100 ISOCS

- ASY18-01852 ASY19-01364 ASY19-01368

Z-295-101 ISOCS

- ASY18-01853 ASY19-00299 ASY19-00447 ASY19-00569
  ASY19-00620 ASY19-00621 ASY19-00656 ASY19-00668
  ASY19-00757 ASY19-00771 ASY19-00772 ASY19-00776
  ASY19-00815 ASY19-00827 ASY19-00857 ASY19-00892
  ASY19-00946 ASY19-00947 ASY19-00955 ASY19-00958
  ASY19-01028 ASY19-01060 ASY19-01089 ASY19-01134
  ASY19-01241 ASY19-01275 ASY19-01282

The audit team concluded overall, NDA activities were determined to be adequate, satisfactorily implemented, and effective.
The audit team evaluated NDA qualification packages for technicians, ITRs, and Expert Technical Reviewers (ETRs) for each NDA system (including initial indoctrination for In-situ Object Counting System [ISOCS]). The auditors verified NDA personnel are trained to the existing industry standardized training requirements of the Standard Guide for Use of Modeling for Passive Gamma Measurements and Guide for the Selection and Qualification of Nondestructive Assay (NDA) Personnel, American Society for Testing and Materials (ASTM) C1726/C1726M and C1490, respectively.

NDA technicians/ITRs have received indoctrination training; on-the-job training; required reading on the WIPP WAP, WIPP WAC, and applicable implementing operating procedures; and training on the objectives of the WIPP program. The audit team received objective evidence to show that NDA operators, ETRs, and ITRs qualifications are current and that they are requalified every two years. For initial qualifications pertinent to the ISOCS, the qualification packages for the ISOCS subject matter expert (SME), senior scientists, ETRs, ITRs, and technicians included qualification cards, resumes, and a letter from Mirion Technologies (Canberra), Inc.; dated 4/30/2018), an industry leader in the nuclear measurements and instrumentation. Canberra recognized Fluor Idaho NDA personnel as possessing the required expertise, training, education, and experience required to perform the ISOCS field measurements, and associated data reviews and validation in accordance with ASTM C1490 and C1726.

During field activities, the following QA-related elements were evaluated to verify compliance with upper-tier QA requirements of the DOE CBFO QAPD:

- **M&TE Certificates of Calibration (COC):** The audit team verified that all NDA-related scales were within the calibration limits and did not exceed the expiration dates listed on the calibration certificates or stickers:
  - RBAS Z-212-105 (WO546317) cal. date: 10/30/18 exp.: 10/30/19
  - IWAS Z-211-102/103 (WO553812) cal. date: 06/13/19 exp.: 06/13/20
  - IWAS Z-390-100/101 (WO555347) cal. date: 06/05/19 exp.: 06/05/20
  - MSI-7300 dyna-link load cell cal. date: 11/19/18 exp.: 11/19/19
  - WAGS-610 cal. date: 09/27/19 exp.: 09/27/20
  - ISOCS – no scale
  - SGRS – no scale

- **NCRs:** The audit team verified quality-affecting problems and items that do not meet established requirements are identified, documented, reported and corrected. The audit team held discussions with the technicians regarding the current process for identification of nonconforming items. Technicians were knowledgeable of the requirements of and utilize the current revision of MCP-538, Control of Nonconforming Items, as required.

- **Document Control:** The audit team verified that the operating procedures are distributed to affected personnel and were verified to be at each NDA system
work location. Each operating procedure contains an effective date and the current status and revision of controlled forms are maintained within eSOMS and WTS.

- NDA-related records: The audit team reviewed BDRs, ETR reports, NDA-related calibration, confirmation & verification reports; raw electronic data including instrument readouts, calculation records and radioassay quality control records; required reading documentation/training watch lists; qualification packages; technical review reports, and other applicable records generated from the NDA process. The audit team found the NDA records accurately reflect completed work and were in compliance with QA requirements.

- NDA supplier assessments are verified to be planned and were conducted as scheduled based on review of the QA Surveillance/Assessment/Audit FY19 Schedule. Merion Technologies (Canberra) was surveilled (report no. 116269) in January 2019 with no issues, observations, recommendations or non-conformance reports (NCRs). The next scheduled assessment of NDA activities will be in January 2020 based on the 4th Quarter 2019, Level 1 TRU Program Data Generation and Validation-Non-destructive Assay Schedule.

- It was verified the QA Manager tracks and performs trend analysis of CAQs and reports quality problems areas to senior management based on the issuance of the Semi Annual Report to Management on Status of TRU Waste Programs Quality Assurance Activities at the AMWTP, 1/1/19 – 6/30/19.

- Based on interviewing the QA Manager, the audit team verified the QA program has no responsibilities un-related to the QA program and verified the QA program interfaces with the management of Fluor management/organizations, project participants, and other stakeholders on QA matters.

- Based on Rev. 2, of the Quality Assurance Project Plan (QAPjP; PLN-5199), the Idaho Completion Project (ICP) has designated a SPM. The SPM oversees the characterization program activities, is responsible for waste selection and tracking, verification/validation of data, reconciliation of data with DQOs, assignment of EPA HWNs, provides QA/QC reports and transmits data (Data Validation and Characterization Information Summaries, WSPFs, Waste Stream Characterization Packages) to the CBFO.

- It was verified that PLN-5199 Rev. 2 was reviewed for concurrence and approval by the SPM, the site QA Manager, the CBFO NTP assistant manager and the CBFO Office of QA.

The procedure reviews, field observations, and document reviews provided evidence that the applicable requirements for characterizing SCG S5000 debris waste, SCG S4000 soils waste, and SCG S3000 homogeneous solids waste using the NDA process is adequately established for compliance with upper-tier requirements, satisfactory in
the implementation of these requirements, and effective in achieving the desired results. No non-WAP-affecting concerns in the area of NDA were identified.

5.6.2 Container Management and Filter Installation

The audit team conducted interviews with responsible personnel and reviewed the following implementing procedures relative to container management and filter installation to determine the degree to which the procedures adequately address upper-tier requirements:

- MCP-4011, Rev. 2, *Waste Receipt and Shipping Inspection*
- MCP-4003, Rev. 9, *Production Planning*
- TPR-8083, Rev. 10, *Waste Container Handling*
- TPR-8108, Rev. 5, *WMF-615 Filter Insertion Operations*

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

The audit team performed a walkthrough of AMWTP container storage areas in buildings WMF-630, WMF-636 Pad 2, and WMF-636 Pad 1; and observed a demonstration of electronic tracking methods; and conducted interviews with operators involved with container management. Container status and location are tracked using the WTS. Containers were chosen from the list of containers in the Electronic Inventory Analysis (EIA) and their documented locations were verified in buildings WMF-630, WMF-636 Pad 2, and WMF-636 Pad 1. A random selection of containers from each building was made, and the location of the selected containers were verified in the EIA. Daily checks are performed and reported to management via email to verify location of acceptable drums.

Movement of containers is accomplished with the use of Production Planning Move Sheets which give the initial location of the containers, number of containers, ending location and the reason for the move or row description.

Storage of containers ready for shipment were verified to be satisfactory and effective in preventing non-eligible containers from being shipped to WIPP. Non-INL containers were verified to be stored separately from INL containers. Containers with NCRs are stored in separate rows from acceptable containers and the WDS system prevents these containers from being used as certified containers using information stored in the WDS and accessed using hand-held scanners. Containers ready for shipment were stored indoors in rows labeled “Containers Ready to Ship,” while rows of containers with NCRs did not have such a label. AMWTP has signage posted at each entry door reminding employees that there may be NCR drums in the building. Labelling of containers was verified to be compliant and tracking of the drums using the labels was acceptable.
Filter installation equipment for TRU drums in Building 634 has been discontinued.

Vent operations in Building WMF-615 were evaluated during this audit. Unvented drums enter the venting chamber via conveyor. The drum is drilled using a remote control drill, and filters are installed by hand using a pass-through glove box. The filters are installed and then, using the conveyor, the drums are removed from the filter installation chamber and stored until characterization operations begin. M&TE calibration of instruments and equipment in WMF-615 was verified to be current and the labels were found to be complete. Personnel training was verified to be current.

Three Bills of Lading from shipments of TRU waste, 003680221 GBF, 003680222 GBF, and 003680222 GBF were examined. These manifests were verified to be complete and compliant with requirements.

The procedures reviewed and objective evidence assembled provided evidence that the applicable requirements for container management and filter installation are adequately established for compliance with upper-tier requirements, satisfactorily implemented, and effective in achieving the desired results. No WAP-affecting or non-WAP-affecting concerns in the area of container management or filter installation 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 corrective action reports (CARs).

Condition Adverse to Quality (CAQ) – An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, nonconformances, and technical inadequacies.

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

6.1.1 WAP-Affecting Corrective Action Reports

No WAP-affecting CARs were identified during the audit.

6.1.2 Non-WAP-Affecting Corrective Action Reports

Two non-WAP-affecting CARs were identified during the audit.
CAR 19-077

Condition:

No objective evidence was provided of a Waste Matrix Code (WMC) being associated with training containers. RTR Operators are currently not identifying the WMC of training containers on the data forms.

Requirement:

DOE/WIPP-02-3122, Rev. 9, F.2 Radiography Training, states in part: “Successful examination of a training container is defined as the acceptable identification of the WMC and prohibited items including observable liquid in excess of waste acceptance criteria limits, the assignment of waste items to waste material parameters, and their estimated weights, as evaluated by a radiography SME.”

CAR 19-078

Condition:

There are no procedural steps in TPR-8089, Rev. 6, Real-Time Radiography Examination (Certification Scans) to describe the actions taken by the RTR Operator when performing rework to confirm the waste stream description as provided by the AK summary report.

Requirement:

PLN-5198, Rev. 3, AMWTP CH TRU Waste Certification Plan, Section 5.8, Performance Requirements, states in part: “The work processes and items supporting and affecting quality are controlled through approved plans and procedures.....These procedures provide the following information:

(D) Step-by-step instructions for the process (including any allowance for out-of-sequence processing).”

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.

6.2.1 WAP-Affecting Deficiencies Corrected During the Audit

No WAP-affecting CAQs were identified and corrected during this audit.

6.2.2 Non-WAP-Affecting Deficiencies Corrected During the Audit

No non-WAP-affecting CAQs were identified and 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.

6.3.1 WAP-Affecting Observations

No WAP-affecting Observations was identified during the audit.

6.3.2 Non-WAP-Affecting Observations

One non-WAP-affecting Observation was identified during the audit.

Observation 1

Currently, the RTR SME is the point of contact when providing instructions associated with the construction of a training container. The work order examined by the audit team referenced a specific individual. In addition, instructions in work orders for building/reconfiguring training containers need to be more specific when reconfiguring a training container. The audit team observed minimal changes to items in the work order.
for the construction of the training container. For example, containers with liquids have not been changed, only rearranged in the training container. RTR Operators need be able to identify containers with items (including prohibited items) common to the waste streams to be characterized and internal containers of various sizes. These conditions may cause RTR operators to routinely identify known liquid amounts, which if not corrected may lead to a condition adverse to quality.

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.

Three Recommendations were identified during the audit.

Recommendation 1

The audit team recommends an editorial change an AWMTP CCEM, as follows:

On Attachment 4, CCEM for BNINW216 [CN 319981, dated July 20, 2017, p. 22], Waste Stream BNINW216 Insignificant Trace Chemicals/Materials, SP-400 (acrylic resin) references footnote “k”, in “Justification & Assumptions” which states, “Magnesium oxide is only slightly soluble in water so it will not be present in any considerable quantity in the aqueous sludge.”

The correct footnote reference should be footnote “o” which states, “Although the Drill and Drain process was included in the AK for this waste stream in preparation for beginning the process, it was discontinued after making only 2 containers that were never added to this waste stream. Therefore SP-400 is not in this waste stream.”

Please note this change was made during the audit.

Recommendation 2

RTR training containers are required to be reconfigured semiannually. The training container was reconfigured on 2/19/19. This training container has not been reconfigured again, in 2019. A work package has been initiated to reconfigure the container.
The audit team recommends that an action item be placed in TrackWise to notify the RTR SME when to construct the next training container.

Also, after the fact, the audit team was provided a Qualified Watch Stander (QWL) developed from the TRAIN system to show the RTR SME is notified of the operators next training container due date.

**Recommendation 3**

The audit team recommends clarifying language in step 2.19 of procedure TPR-8040, Rev. 20, *Boxline Operations*, to process squeezants in the boxline.

**7.0 LIST OF ATTACHMENTS**

Attachment 1: Meeting Attendees and Personnel Contacted During Audit A-19-26
Attachment 2: Personnel Contacted During the Audit by Subject Area
Attachment 3: Summary Table of Audit Results
Attachment 4: WAP-Related Objective Evidence Reviewed During the Audit
Attachment 5: Table of Audited Procedures
Attachment 6: List of Processes and Equipment Evaluated
Attachment 7: WAP-Related Procedure Revision Matrix
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## PERSONNEL CONTACTED DURING THE AUDIT BY SUBJECT AREA (WAP-RELATED)

| Personnel Qualification and Training     | Holly Clark  
|                                         | Frank LaMarca  
|                                         | Kathy Merrill  
|                                         | L.J. Walker  
| Control of Nonconforming Items          | Elvin Dumas  
|                                         | Gary LaBruyere  
|                                         | Angie Morse  
| Records                                 | Janet Cook  
|                                         | Marti McKeen  
|                                         | Angie Morse  
|                                         | Danny Raschke  
|                                         | K.C. Sellars  
|                                         | Delisa Tucson  
| WIPP Waste Information System (WWIS Data Entry) | Jeri Miles  
|                                         | Stormie Winterbottom  
| Waste Certification/Project-Level Data V&V | George Byram  
|                                         | Angie Morse  
|                                         | Joe Poirier  
| Acceptable Knowledge                    | Molly Anderson  
|                                         | George Byram  
|                                         | Steve Carpenter  
|                                         | Ricardo Chavez  
|                                         | Clay Dennert  
|                                         | Lisa Frost  
|                                         | Mindy Giles  
|                                         | Crystal Hart-P'Pool  
| Real-Time Radiography                   | Sam Phillips  
|                                         | Mark Sorenson  
|                                         | Steve Tallman  
|                                         | Gina Tedford  
| Visual Examination                      | Justin Burton  
|                                         | Thad Clark  
|                                         | Sara Fellows  
|                                         | Aaron Fenn  
|                                         | Jeffery Field  
|                                         | Mark Griffin  
|                                         | Ron Grise  
|                                         | Matt Hutson  
|                                         | Josh Peterson  
|                                         | Richard Rowe  
|                                         | Tyrell Thomas  
|                                         | L.J. Walker  

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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
WAP-Related Objective Evidence Reviewed During the Audit

The WAP-related objective evidence supporting the Audit A-19-26 will be included in the shipping box(es) submitted with the final audit report. Included in the shipping box(es) will be a "Content Map" describing the location (using color coding) and identity of all required objective evidence supporting the performance of the audit.
## Audit A-19-26

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**NOTE:** The two procedures above were evaluated during the audit; however, were not included in the 2019 NTP Scope memo for the AMWTP Recertification Audit (CBFO:ONTP:KEP:RMS:19-1376:UFC 5900.00 dated August 8, 2019.

The following were not evaluated during A-19-26 AMWTP Recertification Audit A-19-26: however, were included in the 2019 NTP Scope memo for the AMWTP Recertification Audit (CBFO:ONTP:KEP:RMS:19-1376:UFC 5900.00 dated August 8, 2019.

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**NOTE:** The procedures were not reviewed during the audit due to the following conditions listed below:

67) This procedure has been canceled; therefore was not evaluated during the audit.

68) This procedure has been canceled; therefore was not evaluated during the audit.
## Processes and Equipment Evaluated During Audit A-19-26

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### Processes and Equipment Evaluated During Audit A-19-26

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#### Nondestructive Examination (NDE)

##### Real-Time Radiography

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*Method described in TPR-8103. Location WMF-634. This process has been canceled; therefore, was not evaluated during the audit*
# Processes and Equipment Evaluated During Audit A-19-26

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<td>Visual Examination Procedure – TPR-8103 Description – Newly Generated Waste Visual Examination Closure (VNC)</td>
<td>Solids (S3000) Debris (S5000)</td>
</tr>
<tr>
<td>9VE6</td>
<td>Visual Examination Procedure – TPR-8041 Description – Newly Generated Waste Visual Examination Closure (VNC)</td>
<td>Debris (S5000)</td>
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<tr>
<td>9VE7</td>
<td>Visual Examination Procedure – TPR-8041 Description – Box Line Visual Examination (VEB) – Box to drum repackaging</td>
<td>Debris (S5000)</td>
</tr>
<tr>
<td>9VE8</td>
<td>Visual Examination Procedure – TPR-8041 Description – Box Line Visual Examination (VEB) – Drum to new drum repackaging</td>
<td>Debris (S5000)</td>
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<tr>
<td>9VE12</td>
<td>Visual Examination Procedure TPR-7997 Description – Visual Examination: ARP Packaging Stations (VEA and VEP)</td>
<td>Solids (S3000) Soils (S4000) Debris (S5000)</td>
</tr>
<tr>
<td>N/A</td>
<td><strong>Boxline operations, including Squeezants re-introduced into the boxline and processed for super-compaction</strong> Method described in TPR-8040, Boxline Operations. Location: North and South boxlines at the AMWTP Treatment Facility</td>
<td>Debris (S5000)</td>
</tr>
</tbody>
</table>

## DEACTIVATED PROCESSES OR EQUIPMENT

No processes or equipment have been deactivated since the previous Audit A-18-04.

*TPR-8103 was included in the CBFO NTP Scope dated August 8, 2019; however, this procedure has been canceled.*

**TPR-8040 activities have not previously been included in NTP scopes; this is an initial review.*
## WAP-RELATED PROCEDURE REVISION MATRIX

<table>
<thead>
<tr>
<th>Previous AMWTP Annual Audit A-18-04</th>
<th>Current AMWTP Annual Audit A-19-26</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No.</strong></td>
<td><strong>Procedure Number</strong></td>
</tr>
<tr>
<td>1.</td>
<td>MCP-33</td>
</tr>
<tr>
<td>2.</td>
<td>MCP-48</td>
</tr>
<tr>
<td>3.</td>
<td>MCP-68</td>
</tr>
<tr>
<td>4.</td>
<td>MCP-85</td>
</tr>
<tr>
<td>5.</td>
<td>MCP-538</td>
</tr>
<tr>
<td>6.</td>
<td>MCP-557</td>
</tr>
<tr>
<td>7.</td>
<td>MCP-2064</td>
</tr>
<tr>
<td>9.</td>
<td>PLN-5199</td>
</tr>
<tr>
<td>10.</td>
<td>PRD-4374</td>
</tr>
<tr>
<td>11.</td>
<td>RPT-TRUW-05</td>
</tr>
</tbody>
</table>
# WAP-RELATED PROCEDURE REVISION MATRIX

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<table>
<thead>
<tr>
<th>No.</th>
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<th>Brief Description of Procedure Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>RPT-TRUW-06</td>
<td>Acceptable Knowledge Document for AMWTP Waste</td>
<td>R18</td>
<td>R18</td>
<td>N/A</td>
</tr>
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</table>

## Current AMWTP Annual Audit A-19-26

<table>
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<tr>
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</tr>
</thead>
</table>
| 13. | RPT-TRUW-09      | Acceptable Knowledge Summary for First/Second Stage Sludge (BNINW216) | R9 | R11 | Rev. 10 – Updated for consistency with AKA, CCE, and BoK for waste in the waste handling building, Lot 1 and Lot 2 and to update references.  
Rev. 11 – Restored the numbering in the Reference section that fell out when Rev 10 was issued. |
## WAP-RELATED PROCEDURE REVISION MATRIX

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</tr>
<tr>
<td>14.</td>
<td>RPT-TRUW-12</td>
</tr>
<tr>
<td>15.</td>
<td>RPT-TRUW-56</td>
</tr>
<tr>
<td>16.</td>
<td>RPT-TRUW-83</td>
</tr>
<tr>
<td>17.</td>
<td>TPR-7997</td>
</tr>
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<td>Procedure Number</td>
<td>Procedure Title</td>
<td>Revision During Last Annual Audit</td>
</tr>
<tr>
<td>18.</td>
<td>TPR-8089</td>
<td>Real-Time Radiography Examinations (Certification Scans)</td>
<td>R4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rev. 5 – Changed waste material parameters for uncured cement and Aquaset in Appendix C; revised steps for recording in eSOMS, operator logs and WTS.</td>
</tr>
<tr>
<td>19.</td>
<td>TPR-8041</td>
<td>Facility Visual Examination Operations</td>
<td>R5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rev 6 – Acronym usage, added a new prerequisite for the VEE to ensure VEOs are trained and qualified to address WIPP audit finding and added VEE responsibility to Scope.</td>
</tr>
</tbody>
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<td></td>
<td>Procedure Number</td>
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</tr>
<tr>
<td>20.</td>
<td>WIP-1</td>
<td>TRU Waste Certification</td>
</tr>
<tr>
<td>21.</td>
<td>WIP-2</td>
<td>Level I Data Validation</td>
</tr>
<tr>
<td>22.</td>
<td>WIP-3</td>
<td>Level II Data Validation</td>
</tr>
<tr>
<td>23.</td>
<td>WIP-4</td>
<td>Data Reconciliation</td>
</tr>
<tr>
<td>24.</td>
<td>WIP-6</td>
<td>Collection, Review, and Management of Acceptable Knowledge Documentation</td>
</tr>
<tr>
<td>25.</td>
<td>WIP-7</td>
<td>Preparation of Waste Stream Profile Forms</td>
</tr>
</tbody>
</table>
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<tr>
<td>26.</td>
<td>WIP-9</td>
<td>Preparation of Chemical Compatibility Evaluation and Basis of Knowledge Assessment</td>
<td>R0</td>
<td>R1</td>
<td>Rev. 1 – Removed Attachment 2 because the information was moved into the body of the CCEs, editorial changes for clarification; updated reference section; updated the DOE-ID and CBFO review process for draft CCEs and BOKs; added AK source documents, added clarification for CBFO CCE major/minor changes, and updated the WRC responsibilities.</td>
</tr>
</tbody>
</table>