Allen, Pam, NMENV

ENTERED

From: Biswell, David, NMENV
Sent: Thursday, July 19, 2018 2:52 PM
To: Allen, Pam, NMENV
Cc: Maestas, Ricardo, NMENV
Subject: FW: Audit Report for AK portion of LANL WIPP Re-certification audit A-18-14
Attachments: LANL AK Audit Observ A-18-14 NMED May 2018 - Draft Report (DOS Edits).docx

From: Maestas, Ricardo, NMENV
Sent: Friday, June 01, 2018 10:40 AM
To: Biswell, David, NMENV <David.Biswell@state.nm.us>; McLean, Megan, NMENV <Megan.McLean@state.nm.us>
Subject: FW: Audit Report for AK portion of LANL WIPP Re-certification audit A-18-14

Fyi..

From: Jana Dawson [mailto:dawson.jana@gmail.com]
Sent: Friday, June 01, 2018 10:39 AM
To: Maestas, Ricardo, NMENV <Ricardo.Maestas@state.nm.us>
Subject: Audit Report for AK portion of LANL WIPP Re-certification audit A-18-14

Please see the attached audit report I completed for the observation of the AK portion of the LANL WIPP Re-certification audit A-18-14.

I included a write-up of the issue identified regarding the discrepancy between the VE BDR and AK supplemental information for waste stream LA-MHD03.001 where the waste stream was identified as containing potassium permanganate but the summary form indicated no oxidizers were present. However I did not state whether you/NMED identified this as a concern or not because I did not know what you decided regarding this issue.

Please feel free to contact me if you have any questions or would like me to add anything to the report based on your assessment of the audit results.

Thank you, and I look forward to working with your audit team in the future!

Jana Dawson
Trinity Engineering Associates
703-627-0821

180601

Audit Observation
Acceptable Knowledge

Central Characterization Program (CCP)
Waste Isolation Pilot Plant (WIPP)
Re-Certification Audit A-18-14

May 8-10, 2018

Prepared for:

New Mexico Environment Department

Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building I
Santa Fe, New Mexico 87505-6303

Prepared by:

Trinity Engineering Associates
25 W. Fountain Ave.
Cincinnati, Ohio 45246

May 2018

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I. Purpose

This report documents the New Mexico Environment Department (NMED) observation of the Acceptable Knowledge (AK) portion of the **Waste Isolation Pilot Plant (WIPP) A-18-14 LANL/CCP Recertification Audit** conducted at the Los Alamos National Laboratory (LANL) on May 8-10, 2018. The scope of AK portion of the audit was to evaluate the adequacy, implementation, and effectiveness of technical and related quality assurance (QA) processes for AK characterization of transuranic (TRU) waste, with specific focus on characterization activities associated with the Summary Category Groups (SCGs) S3000 homogenous solids. The audit assessed the AK characterization activities for compliance with the Nuclear Waste Partnership LLC (NWP) Central Characterization Program (CCP) procedure CCP-TP-005, *Acceptable Knowledge Procedure* incorporating the requisite enhanced AK provisions. The Enhanced AK includes the Enhanced Chemical Compatibility Evaluation (CCE) processes and memorandums; AK assessments; AK briefings; the Interface Waste Management Documents List (IWMDL); and the Basis of Knowledge (BOK). The waste streams selected for audit included LA-MHD 01.001, LA-MIN 05-V.001, LA-MHD 03.001, LA-MSG 04.001, and LA-MIN 06-NS.001.

The Department of Energy (DOE) Carlsbad Field Office (CBFO) team lead for the AK portion of this audit was Mr. Richard Blauvelt. The NMED observers were Mr. Ricardo Maestros and Ms. Jana Dawson, NMED support contractor, Trinity Engineering Associates.

II. Background

The WIPP is operated in accordance with the Resource Conservation and Recovery Act (RCRA) regulations/WIPP Hazardous Waste Facility Permit (HWFP) Permit [WIPP Permit] issued under the authority of the Secretary of the New Mexico Environment Department (Secretary) in accordance with the New Mexico Hazardous Waste Act (HWA), NMSA 1978, §§74-4-1 through 74-4-14 and the New Mexico Hazardous Waste Management Regulations (HWMR), 20.4.1 NMAC. The WIPP Permit contains terms and conditions that the Secretary determined are necessary to protect human health and the environment, pursuant to 20.4.1.900 NMAC (incorporating 40 CFR §270.32(b)(2)).

Details pertaining to the requirements for identification and characterization of (TRU) waste, and TRU-mixed waste streams, (i.e., TRU waste containing RCRA hazardous substances or which are RCRA hazardous due to a toxicity characteristic), as promulgated in 20.4.1.500 NMAC (incorporating 40 CFR §264.13(a)) [TRU-mixed waste] are found in the WIPP Permit Attachment C Waste Analysis Plan (WAP) . The CCP is responsible for the identification, characterization, and certification of all TRU/TRU-mixed waste streams destined for disposal at WIPP in accordance with all applicable federal and state regulations, and the WIPP Permit. As defined in the WIPP Permit WAP, identification and characterization of TRU waste streams is accomplished by compiling information documenting the physical, chemical, and radiological components of the waste. The documentation that includes this information is considered the basis for the AK, which is used to characterize the waste. In accordance with the WIPP Permit WAP, the AK characterization information is confirmed with visual examination (VE), AK

assessments conducted by CCP AK Experts (AKEs) and management, followed by non-destructive assay (NDA) and non-destructive examination (NDE) using radiography, and/or waste container sampling and analysis. The compilation and verification of this information is used to certify TRU waste for acceptance and disposal at the WIPP. Characterization of TRU waste is governed by the Nuclear Waste Partnership, LLC (NWP) Quality Assurance Program Description (QAPD) and the *CCP Quality Assurance Project Plan* (QAPjP), CCP-PPO-021, Revision 21, April 17, 2013. The QAPjP describes how waste characterization and certification by the CCP complies with NM 4890139088-TSDF, Waste Isolation Pilot Plant Hazardous Waste Facility Permit (HWFP), Attachment C-C6, WAP (NMED) and the NWP QAPD.

AK is used in TRU/TRU-mixed waste characterization activities in the following ways:

- To delineate TRU waste streams
- To assess whether TRU waste streams are also considered RCRA hazardous waste because the waste exhibits a hazardous characteristic (20.4.1.200 5 NMAC, incorporating 40 CFR §261 Subpart C) [TRU-mixed waste] or due to the presence of listed chemicals (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart D) [TRU-mixed waste]
- To characterize, manage, certify, and dispose of TRU and TRU mixed waste streams in accordance with the Treatment Storage and Disposal Facility Waste Acceptance Criteria (TSDF-WAC) and WIPP Permit requirements
- To estimate waste material parameter weights and to meet payload control requirements

The primary upper-tier documents which mandate the programmatic standards for contact-handled (CH) and remote-handled (RH) TRU waste, and RCRA mixed TRU waste identification, characterization, certification and disposal at the WIPP facility, pursuant to the New Mexico Hazardous Waste Act (HWA), NMSA 1978, §§744-1 through 74-4-14, in accordance with the New Mexico Hazardous Waste Management Regulations (HWMR), 20.4.1 NMAC include the following:

1. Waste Isolation Pilot Plant Hazardous Waste Permit, issued pursuant to the authority of the Secretary of the New Mexico Environment Department (Secretary) under the HWA in accordance with the HWMR, dated March 2018 [WIPP Permit]

2. *Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, Revision 8, dated July 5, 2016 DOE/WIPP-02-3122 [WIPP-WAC]

3. *Waste Isolation Pilot Plan Documented Safety Analysis*, Revision 5b dated April 2016 DOE/WIPP 07-3372 [WIPP DSA]

4. *Department of Energy Carlsbad Field Office Quality Assurance Program Document*, Revision 13, dated April 20, 2017 DOE/CBFO-94-1012 [WIPP QAPD]

5. *Central Characterization Program (CCP) Quality Assurance Project Plan* (QAPjP), CCP-PPO-021, Revision 21, April 17, 2013

<u>Acceptable Knowledge Procedural Requirements</u>

The CCP is tasked with certification of CH TRU waste for transportation to and disposal at the WIPP. One of the steps required in this process is the gathering of the process knowledge for

each waste stream to characterize the physical, chemical, and radiological properties in order to demonstrate compliance with the WIPP-WAC for certification. Procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation* describes how AK is collected, reviewed, and managed by the CCP. The CCP is responsible for collection, review, and management of AK documentation in accordance with the CCP procedure, CCP-TP-005; and reviews and approves the AK summary reports generated by the compilation of all AK information required by the CCP certification process. CCP maintains responsibility for the AK summary reports, which provide a defensible and auditable record of the AK associated with each waste stream and includes all generated forms and records as QA records. In addition, CCP maintains a copy of the "historical source documents" as non-QA records.

As specified in Procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation*, the WIPP Waste Analysis Plan (WIPP-WAP) AK requirements are addressed in CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*; and the WIPP-WAC AK requirements are addressed in CCP-PO-002, *CCP Transuranic Waste Certification Plan*. Additionally, this report provides the AK information required by CCP-PO-003, *CCP Transuranic Authorized Methods for Payload Control* (CCP CH-TRAMPAC).

The previous 2017 WIPP Re-Certification audit, A-17-17 was conducted at the LANL facilities in Los Alamos, New Mexico on May 16-18, 2017. The AK portion of this audit evaluated programs, procedures, and processes for characterizing CH SCGs S3000 solids, S4000 soils/gravel, and S5000 debris wastes, excluding wastes processed through the Waste Characterization, Reduction, and Repackaging Facility (WCRRF). This audit focused on evaluating Waste Campaign (WC) 304 consisting of sixty (60) remediated nitrate salt (RNS) containers stored at Technical Area (TA) 54, Area G, Dome 375 perma-Con, as well as over one hundred (100) containers at the Waste Control Specialists (WCS) facility in Texas. These containers required treatment to render the waste stable, by removing the hazardous waste characteristics of ignitability and corrosivity, in accordance with the WIPP Waste Acceptance Criteria. Waste streams examined included LA-CIN01.001, LA-MHD01.001, LA-MSG04.001, LA-MIN02-V.001, and LA-MIN04-S.001. The A-17-17 audit report concluded that the technical and QA programs evaluated were adequately established for compliance with applicable upper-tier requirements and, excepted as noted in the report, were satisfactorily implemented and effective.

III. Audit Documents

The following is a list of select procedures, AK Summaries, AK Documents, and other AK Reports that were among those provided for review. The list is representative of those documents and procedures related to AK of waste streams LA-MHD 01.001, LA-MIN 05-V.001, LA-MHD 03.001, LA-MSG 04.001, and LA-MIN 06-NS.001 that were examined during the audit:

Procedures

- CCP-TP-005, Revision 29, *Central Characterization Project (CCP) Acceptable Knowledge (AK) Documentation*, November 17, 2016

- CCP-QP-018, Revision 12, *CCP Management Assessment*, March 19, 2018
- CCP-TP-068, CCP, Revision 12, *Standardized Container Management*, December 8, 2015
- CCP-PO-001, CCP Revision 22, *Transuranic Waste Characterization Quality Assurance Project Plan*, January 13, 2016_____
- CCP-PO-002, Revision 29, *CCP Transuranic Waste Certification Plan*, July 22, 2016
- PA-FM-01016, Revision 2, *WCATS Questionnaire*, _____
- CCP-TP-200, Revision 4, *Enhanced Acceptable Knowledge Review*, March 28, 2018

AK Documentation

- CCP-AK-LANL-009, Revision 8, *CCP Acceptable Knowledge Summary Report for LANL Chemistry and Metallurgy Research (CMR) Facility, Waste Streams: LA-MHD03.001, LA-CIN03.001, LA-MIN05-V.001*; November 5, 2013, (Document No. CP-AKLA-UR-13-28386)
- CCP-AK-LANL-015, Revision 0, *CCP Acceptable Knowledge Summary Report for LANL Treated Legacy Nitrate Salt Transuranic Waste, Waste Stream LA-MIN06-NS.001*; March 22, 2018 (Document No. AK-LANL-00199)
- CCP-AK-LANL-010, Revision *6, CCP Acceptable Knowledge Summary Report for LANL TA-21 DP West Facility, Waste Streams LA-MHD04.001, LA-MSG04.001*; February 14, 2013 (Document No. P2010-3392)
- Detailed Chemical Evaluation, Waste Stream MHD01.001, for AK Summary Report CCP-AK-LANL-006, dated April 8, 2005
- *Waste Stream Chemical Compatibility Evaluation for Waste Stream LA-MIN06-NS.001* (AK Source Document CCE08), dated April 5, 2018 – Draft-C
- CCP-AK-LANL-015, *AK Summary Report for CCP-AK-LANL-008*, Revision 0, Attachment 11 "AK Source Document Discrepancy Resolution – Reassignment of Previously Remediated Waste Stream LA-MIN06-NS.001 and Waste Campaign Plan 304," R.5 dated November 17, 2016 (document AK-LANL-00157).
- *AK Summary Report for CCP-AK-LANL-010, TA-21 Attachment 11: AK Source Document Discrepancy Resolution for LA-MHD04.001 regarding Removal of Drum Greater than 50% Solids* (document LA-UR-09-03191)
- Memo to CCP Central Records, dated February 28, 2017 from Michael J. Papp, CCP AKE re: AKA of Containers from AK Summary Report CCP-AK-LANL-010 Waste Stream LA-MSG04.001
- CCP Document Review Record, Acceptable Knowledge Assessment of Containers from Acceptable Knowledge Summary Report CCP-AK-LANL-010 Waste Stream LA-MSG04.001
- LA-MIN05-v.001 (mixed absorbed TRU waste stream)

Basis of Knowledge

- BOK15_SD – MIN05 and BOK12_SD – MHD03.001

WWIS/WDS

- WIPP Waste Information System (WWIS)/Waste Data System (WDS) and reporting data on containers for disposal at the WIPP

- CCP-PO-012, Revision 16, *CCP/Los Alamos National Laboratory (LANL) Interface Document*, February 26, 2016
- Document Services Review Record – CCE 11 Waste Stream LA-MHD03.001
- Waste Compliance and Tracking System (WCATS) Waste Profile Form Waste Stream Identification 42333 - Revision 2, PA-FM-01016, R2

CCE

- Waste Stream Chemical Compatibility Evaluation Memorandum, CC08 Draft-D, Chemical Compatibility Evaluation for Waste Stream LA-MIN06-NS.001 (AK Source Document CCE08)

NDA

- BDR 2LANDA1293, NDA Counter HENC 2, dated 04-27-17, Container IDs: 53718, 53809, 53833, 54045, 54236, 54263

NDE

- CCP Nonconformance Report, NCR No. NCR-LANL-0425-17 Revision 0, Batch Data Report (BDR) LA-HERTR-17-0004
- BDR LA-HERTR017-0012, Waste Stream LA-MHD01.001, dated 11-13-17, Container IDs: 70263, 70277, 70575, 70593
- CCP NCR. No. NCR-LANL-0493-17, Revision 0, November 9 2017
- BDR LA-HERTR-17-0013 Dated, 11-14-17, Waste Stream LA-MHD01.001, Container IDs: 70231, 70266, 70273, 70585, 70596

Flame Gas

- BDR LA-HERTR-17-0014, dated 12-05-17, Waste Stream ID LA-MHD01.001, Container IDs: 71953, 70584
- BDR LA-HERTR-18-0001, Waste Stream ID LA-MHD01.001 dated 3-5-18, Container IDs 70134, 70111, 70167
- CCP NCR No. NCR-LANL-0132-18, Rev. 0 for BDR LA-HERTR-18-0001 dated March 22, 2018

VE

- BDR Number: LAVE030073, Waste Stream LA-MHD03.001, Examination Date May 24, 2017, Container ID: 71598

Flame Gas

BDR Number: LA17FG2005, dated 8-30-17, Container ID: 67667Waste Container Tracking

- LANL AK Tracking Spreadsheet 5-3-18 12_36_56

IV. General AK Audit Observations and Discussions

The AK portion of the LANL WIPP Re-certification Audit A-18-14 was conducted by the CBFO Technical Assistance Contractor (CTAC) auditors Mr. Dick Blauvelt (by phone), Mr. Ricardo Chavez, and Mr. Randy Fitzgerald. The AK portion of the audit was observed by the New

NMED representative, Jana Dawson with Trinity Engineering Associates and Ricardo Maestas, NMED.

The AK Summary Reports selected for review as part of the A-18-14 audit included the following:

- CCP-AK-LANL-006, for LANL Waste Stream LA-MHD01.001
- CCP-AK-LANL-009 for LANL Chemistry and Metallurgy Research (CMR) Facility, Waste Streams: LA-MHD03.001, LA-CIN03.001, LA-MIN05-V.001
- CCP-AK-LANL-010 for LANL TA-21 DP West Facility, Waste Streams LA-MHD04.001, LA-MSG04.001
- CCP-AK-LANL-015 for LANL Treated Legacy Nitrate Salt Transuranic Waste, Waste Stream LA-MIN06-NS.001

AK Process for Waste Characterization and Certification

Mr. Blauvelt opened the audit on May 8, 2018 with a discussion of how the AK documentation is gathered and reported.

Currently Generated Waste AK Characterization

Currently there are two active streams at LANL, (1) newly generated LA-MHD01.001 and LA-MHD03.001. The process of gathering AK information begins with collecting the numbers and type of containers in a given waste stream, along with historical AK reports and documents. Mr. Blauvelt stated that some LANL procedures pre-date the waste container generation process but do not pre-date when waste stream began being generated. For Waste Stream LA-MHD03.001 that was selected for specific review as part of this WIPP Re-Certification Audit A-18-14, generation began in the 1970s. Historical draft AK reports include references to historical documents; and the draft AK report is one of the referenced documents in the current AK summary reports. Container counts come from a LANL database. The CBFO Technical Assistance Contractor (CTAC) would compare the container information from the older database, CONCERT, to the current list of containers in Waste Compliance and Tracking System (WCATS) yearly. Table 5 of the current AK summary reports includes the list of containers. Mr. Blauvelt noted that for waste stream LA-MHD03.001, the AK summary report includes references for historic LANL documents (e.g., waste profile form), but does not state which document supersedes each of the historical documents. Mr. Blauvelt suggested that the link between historical documents and current AK requirements be explained in the AK summary reports. For example, Procedure M-012, *Waste Profile Form Guidance*, Revision 0 and 1 (2003) states that the waste profile form is now addressed in the WCATS questionnaire and database. Mr. Blauvelt recommended that information be included in the AK summary report that states which documents/processes supersede outdated historical documents/requirements.

It was discussed that the AK Summary Report, Attachment 9, Interface Waste Management Documents List (IWMDL) is where current waste generation and waste management documents are listed. CCP started with a list of current practices and then built the list of historical documents from the current procedures and documents.

The August 2015, Revision 27 version of the IWMDL included a new mandate for Attachment 9. Starting December 1, 2016, the procedure required starting with the AK report

and using the operations procedures to develop the list of documents for the IWMDL. The current CCP) Procedure CCP-LANL-005 states that the CCP AK Expert (AKE) will compile (i.e., gather) source documents that identify TRU waste management program information in the Acceptable Knowledge Documentation Checklist. The AKEs follow up by meeting with facilities personnel to update latest revisions of procedures, and then contact the Site Management Representative (SMR). For example, when waste is remediated, such as the nitrate salts waste, it is put on the IWMDL. The purpose of this IWMDL form is to identify and maintain a current list of generator site plans, procedures, and reports associated with current waste management and packaging (e.g., waste management, waste generation, waste treatment, waste packaging, waste repackaging, waste remediation, waste stream delineation, and waste characterization procedures). This IWMDL form is to be reviewed before the AKE submits an "Add Container Memo", allowing shippable payload containers to be added to the Waste Containers List or Container Tracking Spreadsheet. In addition, the form identifies the generator Points of Contacts (POCs) and Subject Matter Experts (SMEs) from the groups directly involved with the generation, characterization, and management of containers in the waste stream.

Mr. Blauvelt noted that in Revision 3 of the WCATS, the AK source summary write-up listed the processes that were completed for generation and characterization, and the information was verified as being completed on a specific date. The AK Assessments (AKAs) discussed previous versions and what occurred in the past. The IWMDL, Attachment 9 of the AK Summary Report does not provide a discussion of historical activities because it is completed to document current waste management activities for newly generated wastes only.

The CMR Waste Management Requirements procedure is now retired; therefore, Mr. Blauvelt inquired about how CCP personnel update the Attachment 3 forms in the AK Summary Report for the TA55 program. CCP representative, Ms. Sherrie Nance, an AKE stated she gets a daily list from TA55 with all of the document revisions listed. Ms. Nance stated that if there are any discrepancies and questions, she may contact the SME or other staff as appropriate to clarify.

Ms. Nance and Mr. Michael Papp, CCP AKEs stated that for the IWMDL, they would discuss the information with the designated POC and SME. When CCP performs a field observation, such as in the field observation of waste stream LA-MIN06-NS.001, CCP representatives watch the process on video with DOE and other observers. CCP representatives stated that they were able to ask questions during this process.

CCP personnel stated that there may be a lot of discussions and questions and answer exchanges with the POC and SME regarding procedures processes before the waste is considered verified and the date of verification is documented.

Waste Container Evaluation and Addition to the Container Tracking Sheet

The "Add Container Evaluation" is the process whereby container information/AK is reviewed and the procedures reviewed are documented on the IWMDL. Once the container is verified, the AKE completes the "Add Container Memo" as the formal process for identifying a container as certified and approved for tracking and WIPP disposal.

CCP Procedure CCP-TP-030, Revision 36 , *CCP CH TRU Waste Certification and WIPP Waste Information System (WWIS)/Waste Data System (WDS)*, effective as of January 31, 2017; describes the process for entering and reporting data on containers requiring certification for

disposal at the WIPP. This step occurs after the AK information has been compiled, reviewed by the AK Experts, and verified to be accurate and complete.

For the P410 initial verification, Mr. Blauvelt stated there was a change to the RNS waste treatment process that was significant and a statement was made that certain containers would have to be re-evaluated. Based on the revision, containers on the AK Summary Report Attachment 3 needed to be re-evaluated on a container-by-container basis. Mr. Papp suggested they freeze file the AK summary report to ensure any changes are effectively identified and captured.

Containers 69354, 69360 were over packed with other containers that cannot be shipped (from LA -MHD03.001). For LA-MIN05-v.001, these containers are not included in the LA-MIN05-v.001 waste stream on the tracking spreadsheet because LANL cannot ship them to WIPP.

The audit continued on May 9, 2018 at 8:30 am.

Review of documentation for Waste Streams MHD03.001 and LA-MIN05-v.001

During the audit, CTAC auditors noted the Visual Examination Batch Data Report (BDR) for waste stream LA-MHD03.001 included AK information listing potassium permanganate as a chemical used in the process that generated the waste stream. The BDR form stated that glassware in this waste stream was rinsed with potassium permanganate ($KMnO_4$). However, the WCATS questionnaire was filled out indicating no oxidizers were present. It was noted that the AK summary for LA-MHD03.001 does not include the oxidizer designation; however, the oxidizer designation is listed in the AK Summary Report for waste stream LA-MDH01.001. For waste stream LA-MHD01.001, a draft CCE exists in the AK Summary report in Attachment 4 – CCE. However, a draft CCE had not been written for waste stream LA-MDH03.001.

The container 71598 from this LA-MHD03.001 waste stream in question, was not listed in the AK tracking spreadsheet.

CCP personnel were questioned about how VE BDRs are generated. CCP AKEs stated that they reconcile AK characterization information after VE is completed. AKEs Ms. Nance and Mr. Papp stated they look at WCATs and the AK summary to make sure they match. Then they add additional information to the CCE if it needs to be updated. The AKEs review VE, CCE, and supplemental AK information to determine if all the information is consistent. If the AK information is not consistent, the AKEs conduct additional investigation and as needed, SME/POC interviews to determine whether the CCE/AK needs to be updated or whether they can freeze file the CCE/AK if it is not something that will significantly affect the characterization. It was also noted that while VE is used to validate the AK by verifying the physical form does not contain prohibited items such as liquids, VE could not be used to verify chemical constituents or incompatibility. This step must be completed during the AKE review. Further, it was noted that waste stream LA-MHD03.001 (CCE11) includes nitrate salts, which are particular to the debris waste streams, but that a liquid is needed to disperse the salts to have a chemical compatibility problem/hazard. For the MDH03.001 waste, everything that went into this waste stream was sorbed, therefore there could be inorganic sorbents. However, even though this waste stream is a debris stream, the overall matrix is cement so chemical compatibility is not a concern.

The process of generating a new waste container was discussed among the audit team. LANL will load a container several times before the drum is considered complete and is considered a

waste container ready for review and certification. During this process of adding material to a container, material is loaded in container and it is locked until it is opened again to put more waste in it. Each time waste is emplaced, two VE personnel sign there are no prohibited items in the container. On the last day, it is closed, and the prohibited items checklist is completed. The standing work order says absorbed liquids as well as liquids must be identified, and the BDR should indicate no prohibited items. VE should also be verifying AK information. The supplemental information is not provided prior to VE, and VE personnel are not present when supplemental information is provided, it is only provided after VE is completed. VE personnel are only responsible for identifying what they see; they are not responsible for CCE chemicals. VE will note anything that is discolored or stained. If they see a glass container is empty and not stained, no problems are noted. VE verifies AK. For example, the paperwork for the container stated that a glass container was rinsed, dried, and bagged. The LANL AK operator that competed the supplemental AK that stated the glassware he saw was discolored. Then he went to the generator, found out what it was, and also that it was rinsed and dried. The LANL CCP VE operators did not have this information when the VE was performed. The CCP AKE reviews the AK summary report, supplemental AK, CCE, and BDRs to reconcile all the information.
VE Operators and CCP AKE were interviewed. VE and CCP personnel stated that Supplemental AK is required to document chemicals because VE cannot identify chemicals. While the drum is being packaging, the contents are considered to be in-process material for which LANL is responsible. LANL does the Visual Inspection (VI) with CCP CTAC staff looking observing their work. LANL AK staff fill out the supplemental AK information during VE. CCP personnel put a Tamper Indicating Device (TID) on the drum at the completion of packing and accept the container as a waste.
After the container has gone through VE and project level review (Site Project Manager [SPM] review), the AKEs review the information. Once all AK reviews have been completed, the AKE completes the Add Container Memo that directs CCP to include the container on the AK tracking spreadsheet. Once this process is complete, the container(s) undergoes the NDA and Real-Time Radiography (RTR) evaluations.
LANL uploads the WCATS questionnaire to WCATS. A recent standing order eliminated the requirement to attach supplemental AK information to BDR; it is accessed in WCATS.
The populations of eligible containers include those listed in the AKA reports. The containers approved for certification are included in the AK tracking spreadsheet. For example, for waste stream LA-MSG04, the AK tracking spreadsheet will contain the list of certified containers from this waste stream.
As discussed previously, the intent of the AK Summary Report Attachment 9, IWMDL is to provide a record of all documentation regarding waste generation, and management processes and procedures, and identify the generator POCs/SMEs from the groups directly involved with the generation, characterization, and management of containers in the waste stream. However, the current Procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation* is not worded this way. Mr. Blauvelt said this issue would be tabled as a concern, with the explanation that the audit team and CCP personnel agree with the assessment that Procedure CCP-TP-005 it is not well written. Mr. Blauvelt stated that regardless, the procedure is working and that Ms. Sherri Nance and Mr. Papp have done an excellent job and things are working well. Mr. Papp requested a formal freeze file to modify this section describing the purpose of the IWMDL in the next revision of Procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation*. Mr. Papp

stated a draft is in process for the next revision of CCP-TP-005, Revision 29, *CCP Acceptable Knowledge Documentation*, dated November 16, 2016.
Ms. Nance and Mr. Papp stated that daily procedure updates are circulated among all CCP staff, and CCP AKEs check these updates daily.

Waste Stream Characterization Checklist

Both LA-MIN 05-v.001 and MHD03.001 have the potential to have poly-organics in the waste. For waste stream LA-MIN05-v.001 (CCE15), metal perchlorates are discussed in the AK information because some material in this waste stream was obtained from LANL building ducts. The ducts at LANL were all evaluated to ensure metal perchlorates were not present in these structures. LANL CCP and CTAC personnel determined that the concentrations of metal perchlorates were insignificant for explosive purposes. Excess perchlorates were disposed down process drains to TA 50 and as such were neutralized. CCP said if any chemical is present in less than a 1% concentration in a container, it is considered a "trace" amount.

CCE

In Document C390 (AK source document) the CCE has the Chemical Table with the Environmental Protection Agency (EPA) Reactivity Group Numbers (RGN) included. Mr. Blauvelt stated it would be good if the Chemical Compatibility Evaluation Memorandum (CCEM) and AK Summary Report (AKSR) were approved simultaneously so that when the AK Summaries are published, they contains all of the CCE chemical table information.
Draft revision of the C390 CCE memorandum still has a chemical table which adds chemicals missing from the remediation process; however not all of the chemicals are regulated. Mr. Papp said he believes the chemical table for non-regulated chemicals should be removed. The AK summary section on chemicals points to the CCE.

Daily audit caucus for May 9, 2018

- AK – 85% complete with one concern.
- DQO reconciliation – 50% complete, no concerns.
- Project Level – BDR, Waste Profile Forms and CIS's – 100% complete, still need to look at quarterly reports that are 85% compete. No concerns.
- RTR – 75% complete, one concern.
- VE – 50% complete, one concern.
- NDA – 75% complete, no concerns
- Flame Gas – 90% complete, no concerns.
- Container management – 85% complete, no concerns.
- NCR records – 100% complete, no concerns.
- WCS and training – 98% complete, no concerns
- No characterization (CCP-TP-030, Revision 36 procedure) currently being performed at LANL therefore waste certification or Waste Data System (WDS) implementation is currently occurring.

There were two concerns in total: one from RTR and one AK concern.
The RTR concern resulted from a review of Standing Order 123 and review of the RTR BDRs. The CTAC auditors were looking at BDRs that identified some items as plastics, and noted that some containers with plastics were documented in Non-Conformance Reports (NCRs) and some were not. After further investigation, CTAC auditors discovered that this was because there are

plastic filter bags in some containers that function as a radiological control, not a waste and therefore do not constitute a prohibited item in these containers. Currently documented NCRs are correctly identified for waste that had additional plastics (bottles), i.e., combustibles. No concerns were identified as a result of this audit investigation.

Audit activities continued on the morning of May 10, 2018 at 8:30 am

Enhanced AK Evaluations

AK Assessments

Section 4.13 of CCP-TP-005, *CCP Acceptable Knowledge Documentation* states that in order to ensure that the AK documentation relating to the management of potentially reactive, corrosive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AKSRs, an AKA will be performed for existing AK Summary Report waste streams (or waste stream subpopulations) with unshipped containers.

The list of containers for any given waste stream will be in the AKA, but not in the AK summary report. For example, the AKSR AK15, Attachment 9 includes the CCE, current procedures, and incorporates everything collected for the AKAs. A cross walk between the AKSR (source document table) and what is in the AKA is performed by CTAC AKEs.

The BOK is a stand-alone, container-by-container summary. The BOK is in the AK record, but is not included in AKSR. However, the BOK is referenced in AK Summary Report. AK Procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation* references the BOK. The CCE process identifies certain conditions or certain materials as not acceptable. It is noted that the BOK requirements did not come from a request made by NMED; rather it was implemented as a result of research conducted by the CBFO. Since the BOK is called out in the AK Summary procedure, it should be mentioned in AK Summary Report. This was a recommendation that would be made by CTAC auditors. The BOK is written using the AK Summary information.

The AK Summary Report Attachment 6 includes a checklist item for incompatibility and currently points to an incompatibility study done by Transportation Safety Group that goes into the TRUCON code manual for each waste stream. CTAC Lead auditor, Mr. Blauvelt stated that since the CCP has developed a procedure for addressing incompatibility, the AK Summary should take credit for this.

Enhanced CCE

The CCEM and AKA are required per Procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation*. These documents are written by the AKE and reviewed by SPMs. The review of CCEMs and AKAs under this procedure ensures that each of these documents meets the requirements specified in Procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation*, is of good quality, and is technically defensible. CTAC auditors stated that the current Enhanced AK supplemental questionnaire should focus on regulations for prohibited items, and as such focus on ensuring prohibited items or chemical compatibility problems do not exist.

IWMDL – Newly Generated Wastes

The IWMDL was determined by the CTAC auditors to be working well. Procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation*, Section 4.2 requires identifying SMEs and POCs and including discussion or names of SME/POC personnel on the AK verification forms

when changes to procedures don't impact the waste. CTAC auditors believe this requirement is redundant and should be removed. The inclusion of the discussion and names of SMEs/POCs is appropriate when changes do affect the waste characterization/management. A freeze frame was submitted by Mr. Papp to remove this requirement. To clarify, the AK Summary Attachment 3 and Attachment 9 IWMDL will always identify procedure changes; however, if the change does not affect waste management, it does not need to be discussed with SMEs or POCs.
The AK initial verification will always include documentation of procedure changes and identification of SME/POCs. If there is impact to waste management, the SME and POCs will be contacted. If there is not an impact, the SMEs and POCs will not be contacted.

Basis of Knowledge
The Basis of Knowledge (BOK) evaluation memorandum is also required by CCP-TP-005, *CCP Acceptable Knowledge Documentation*. Prior to shipment, a review of previously certified containers will be performed using the Waste Data System (WDS) to ensure that each container has been evaluated in an approved BOK evaluation memorandum. The BOK review does not consider requirements related to RCRA. After the BOK evaluation is completed, a recommendation is made to the BOK board. BOK board members vote. The vote is weighted, and if the head of the board says the waste can go forward, the waste will go forward. Once it is determined that a container can be added to the AK tracking spreadsheet, an "Add Container Memo" is generated and submitted. BOK15_SD – MIN05-v.001 and BOK12_SD – MHD03.001 were reviewed. No discrepancies or deficiencies were identified.

CCP Surveillances
The CTAC auditors discussed walk downs that were conducted in accordance with CCP Procedure CCP-PO-045, Revision 3, CCP Waste Management Field Observation, July 20, 2017. CTAC believes field observations/walk downs are appropriate for waste generation or management activities, but not necessarily for watching someone fill out paperwork.
Ms. Nance stated she has done some field observations and she suggests considering additional language in this procedure to clarify which activities are appropriate for walk downs and which are not.

The LANL Re-certification WIPP Audit A-18-14 concluded on May 10, 2018.

V. Audit A-18-14 Acceptable Knowledge Findings

CTAC auditors identified that the VE BDR for Waste Stream LA-MHD03.001 included AK information listing potassium permanganate, an oxidizer, as a chemical used in the process that generated the waste stream. The BDR form stated that glassware in this waste stream was rinsed with potassium permanganate ($KMnO_4$). However, the WCATS questionnaire was filled out indicating no oxidizers were present. This created an apparent discrepancy in AK characterization of a container in the LA-MHD03.001 waste stream. CTAT auditors then interviewed CCP AKEs about how VE BDRs are generated and how the AK process proceeds after VE is completed. CCP AKE personnel stated once they 'receive' a waste container following VE, they look at WCATs and the AK summary to make sure the information matches. They review the AK summary, VE BDRs, CCE and supplemental AK to assess whether all the information is consistent. If the information is not consistent, the AKEs conduct additional

investigation, and as needed, interview SME/POCs to determine whether the CCE or other AK documentation needs to be updated or whether they can freeze file the CCE/AK if it is not something that will significantly affect the characterization.

The VE operators and CCP AKE personnel were interviewed at an audit caucus on May 9, 2018. CCP personnel stated that supplemental AK is required to document which chemicals are in the material because VE processes cannot identify chemicals. While the drum is being packaged, the material is considered in-process and LANL is responsible. LANL completes the VE with CCP staff observing the activity. AK staff fill out the supplemental AK information during VE operations. If the container is not yet full, CCP personnel put a TID on the drum at the completion of packing while it is stored, until the next batch of material is added to the container. Once the container is full, has gone through the VE process, and the AK documentation has been collected, CCP then accepts the material/container as waste, which becomes the point of waste generation.

After the container has gone through VE and the BDR has been completed, then a project level review (SPM review) and AKEs review is completed. Once all AK reviews for a waste stream container have been completed, the AKE completes the "Add Container Memo" which directs CCP to include the container on the AK tracking spreadsheet. Once this process is complete, the container(s) undergoes the NDA and RTR evaluations.

It was noted that waste stream LA-MHD03.001 (CCE11) includes nitrate salts, which are particular to the debris waste streams but that a liquid is needed to disperse the salts to have a chemical compatibility problem/hazard. For the MDH03.001 waste, everything that went into this waste stream was sorbed, therefore there could be inorganic sorbents. However, even though this waste stream is a debris stream, the overall matrix is cement so chemical compatibility is not a concern.

Appendix A - CCP-TP-005 Implementation

The Central Characterization Program's (CCP) primary Acceptable Knowledge (AK) procedure is CCP-TP-005, *CCP Acceptable Knowledge Documentation*. Revisions 27 and 28 included a new, "enhanced" AK process. Revision 29 incorporated lessons learned after implementation of the enhanced AK requirements and incorporated Standing Order CCP-SO-119, Revision 0. In addition, Revision 29 implemented a container review for the requirements of the basis of knowledge document.

The following summarizes the AK Process as presented in CCP-TP 005 and identifies "enhanced" elements new to the Acceptable Knowledge process. This procedure applies both to contact handled (CH) and remote handled (RH) TRU waste.

AK compilation is the first step in the acceptable knowledge process, and involves the collection of AK information and assembly of the "waste stream". A waste stream is defined in Attachment C as, "waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity". Figure 1 summarizes the acceptable knowledge compilation process.

Following compilation, documents are formally assigned a source document identifier based on the "type" of document it is, which include Acceptable Knowledge Assessment (AKA), Chemical Compatibility Evaluation (CCE), Correspondence (C), Documents (D), Miscellaneous (M), Procedure (P), Discrepancy Resolution (DR), and Unpublished Documents (U). An AK Source Document Summary (CCP TP 005 Attachment 3) is prepared that summarizes relevant document contents and documents data limitations and other items. In addition, the Acceptable Knowledge Information List (CCP-TP-005 Attachment 4) is prepared which is a reference list that includes ALL sources documents for a waste stream, not just those added at the end of an AK Summary. Attachment 4 includes the following:

- Site, waste stream number, and waste stream description
- Source document tracking number
- Source document title or description
- Name of author
- Original document number, or publisher's document number (if available)
- Revision number and document date (if applicable)

Once all of the AK information in the AK Summary Report, BDRs, and Supplemental AK is reviewed, reconciled and verified by CCP AKE and management staff, AKEs generate an "Add Container Memo" authorizing the addition of individual waste containers to the AK Tracking Spreadsheet (AKTSS, also known as the Acceptable Knowledge Container Tracking Spreadsheet). This spreadsheet tool tracks drums status for every drum in waste streams with respect to vent date, certification status, and other waste stream information. It is kept current so that at any point in time, drums in a given waste stream can be identified and their status ascertained.

Procedure CCP-TP-005, *CCP Acceptable Knowledge Documentation* provides a comprehensive set of instructions for CCP personnel responsible for assembling, evaluating, documenting, and verifying acceptable knowledge (AK) characterization information for transuranic (TRU) waste streams that may be eligible to be disposed of at the Waste Isolation Pilot Plant (WIPP).

Verification of AK documentation includes an audit process whereby each generator site's documentation and processes are reviewed to determine the AK accuracy; sufficiency; adherence with procedures CCP-PO-001, CCP-PO-002, CCP-PO-003, CCP-PO-050, CCP-PO-401, and CCP-PO-505; and identification and resolution of any noted discrepancies in AK documentation. The procedure includes instructions for ensuring compliance with the AK waste characterization requirements specified in the WIPP RCRA Waste Disposal Permit.

AK includes any documentation that describes or verifies site history, mission, and operations, in addition to waste stream-specific information used to define the generating process, waste matrix, waste quantities, and contaminants (radiological and chemical). The information required in the performance of this procedure is used to prepare an AK Summary Report or an AK Sufficiency Determination.

As shown in Table 1, there are four <u>new</u> documentation/review requirements associated with AK that are part of the new enhanced AK process. These are:

- <u>Interface Waste Management Documents List (IWMDL)</u>: This list, created first by the CCP AK expert but verified and checked for relevance and procedural revision by the site representative, is a list of current generator-site procedures that affect waste stream management and packaging. The list is updated at least quarterly when the site representative verifies relevance/new procedures, or more frequently. The AKE maintains the list, which is presented in Attachment 9 of CCP TP 005. The AKE also has the responsibility to "walk down" the procedure, (i.e. work with the site to understand implementation of the procedure with respect to the effect the procedure has on waste composition, compatibility, etc.) Every waste that is actively being characterized (i.e. newly generated or repackaged) will have an associated IWMDL that documents *ongoing* waste packaging/management activities performed by the generator site. In short, the intent of this list is to document what is currently being done to waste at generator sites prior to CCP acceptance of that waste into a waste stream.
- <u>Acceptable Knowledge Assessment (AKA)</u>: The Acceptable Knowledge Assessment is a report that is prepared, based on AK, to "ensure that the AK documentation relating to the management of potentially reactive, corrosive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AK Summary Reports". For existing waste streams or waste stream subpopulations with unshipped containers, this one-time report will be prepared although NEW waste streams may not prepare an AKA but instead incorporate all of the following requirements into the AK Summary:
    - Waste stream summary (brief description of the waste stream and generating activities)
    - Historic waste management practices
    - Current waste management practices
    - Waste remediation and repackaging practices
    - Absorbent, immobilization, and neutralization reagents
    - Container specific documentation collected and reviewed
    - New and revised AK source documents
    - AKA conclusions, assumptions, and limitations, and
    - List of containers bounded by the evaluation

Table 1: Information Included in AK Summary and New Enhanced AK Reports

General Information Required in AK Summary and CCP- TP-005, Revision 29, November 17, 2016 and Associated Attachments or Documents
CCP-TP-005 Rev. 29 and the AK Summary Report incorporate lessons learned after implementation of the enhanced AK requirements from Standing Order CCP-SO-119, Revision 0, established after the WIPP 2014 Radiological Release events.
Justification of High Level Waste and Spent Nuclear Fuel (HLW/SNF) exclusion and Defense Determination
A TRU Waste Management Program Description that addresses: • All documents in CCP-TP-005 Attachment 1 • List for current waste management procedures at generator sites, Attachment 9 • Ensures specific document contents and comparisons are included • Correlates TRU waste management program information (AK #s PR1 - PR8) and TRU waste stream-specific information (AK #s WS1 - WS12) with regard to the time of generation, waste generation processes, rate and quantity of newly generated waste (when appropriate), and areas and building or facility where the waste stream was generated, as specified in Permit Attachment C4.
Assignment of waste matrix codes, waste material parameters, waste matrix code groups, summary category groups, and identification of other physical parameters, as well as layers of confinement and exclusion of prohibited items; this is also documented on Attachment 6 of CCP-TP-005.
Identification of chemical contents and assignment of hazardous waste numbers (HWN) and completion of CCP-TP-005 Attachment 5.
Radionuclide content of waste and other related information including two most prevalent radionuclides, isotopic distribution of EPA's 10 required radionuclides, and preparation of CCP-TP-005, Attachment 7 with the AK-NDA memo attached that describes the review and concurrence of both the Acceptable Knowledge Expert (AKE) and NDA subject matter experts (SMEs).
To ensure that the AK documentation relating to the management of potentially reactive, corrosive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AK Summary Reports, an AK Assessment will be performed for existing AK Summary Report waste streams (or waste stream subpopulations) with unshipped containers.
Identification of waste containers and waste stream volume, including container types and future projections. CCP-TP-005, Attachment 8, is a Waste Containers List (or an equivalent form, e.g., spreadsheet) for the containers determined to be bounded by the Hazardous Constituents, Waste Form, Waste Material Parameters, Prohibited Items, and Packaging, and Radionuclide forms. Attachment 8 is typically updated using "add container" memos, which add/remove containers from the tracking spreadsheet from the original containers included in the waste stream.
Annual Transuranic Waste Inventory Report (ATWIR) waste stream number.
Payload management information for those waste streams intended to be so managed (i.e., payload would include drums both above and below 100 Nano curies per gram (nCi/g) in accordance with CCP-PO-002, so long as the payload as a whole measured greater than 100 nCi/g).
Justification for determining that prohibited items are not present in the waste stream or describe the potential prohibited items and how they will be identified and remediated and identification of process controls associated with the management of prohibited items, physical form, and hazardous waste content.
Determination of whether any waste in the waste stream contains polychlorinated biphenyls (PCBs) in concentrations equal to or greater than 50 parts per million (ppm).

General Information Required in AK Summary and CCP- TP-005, Revision 29, November 17, 2016 and Associated Attachments or Documents
As applicable, information to support correlating or surrogate information from similar materials or waste streams generated at the same site or other sites used to support the characterization of an RH waste stream, as documented in CCP-TP-005, Attachment 15. Note: RH waste streams are currently not being accepted at WIPP.
A requirement to conduct a Basis of Knowledge (BOK) Evaluation of the Acceptable Knowledge Summary Report for waste that may contain oxidizing material. (Note: incorporated in Rev. 29).
List of Checklists and Records Attachment 1 – Acceptable Knowledge Documentation Checklist Attachment 2 – Records of Communication Attachment 3 – Acceptable Knowledge Source Document Summary Attachment 4 – Acceptable Knowledge Information List Attachment 5 – Hazardous Constituents List Attachment 6 – Waste Form, Waste Material parameters, Prohibited Items, and Packaging Form Attachment 7 – Radionuclides Form Attachment 8 – Waste Containers List Attachment 9 - Interface Waste Management Documents List for currently generated waste/current waste management procedures; AKE/SMR Verification required with procedure walk down Attachment 10 – Acceptable Knowledge Re-evaluation Checklist Attachment 11 – Acceptable Knowledge Source Document Discrepancy Resolution Attachment 12 – Acceptable Knowledge Summary Report Form for currently generated waste Attachment 13 – CCP Waste Stream Characterization Checklist Attachment 14 – Acceptable Knowledge Accuracy Report Attachment 15 – CCP TRU Waste Correlation and Surrogate Summary Form Attachment 16 – Chemical Compatibility Evaluation Form and Content Guide

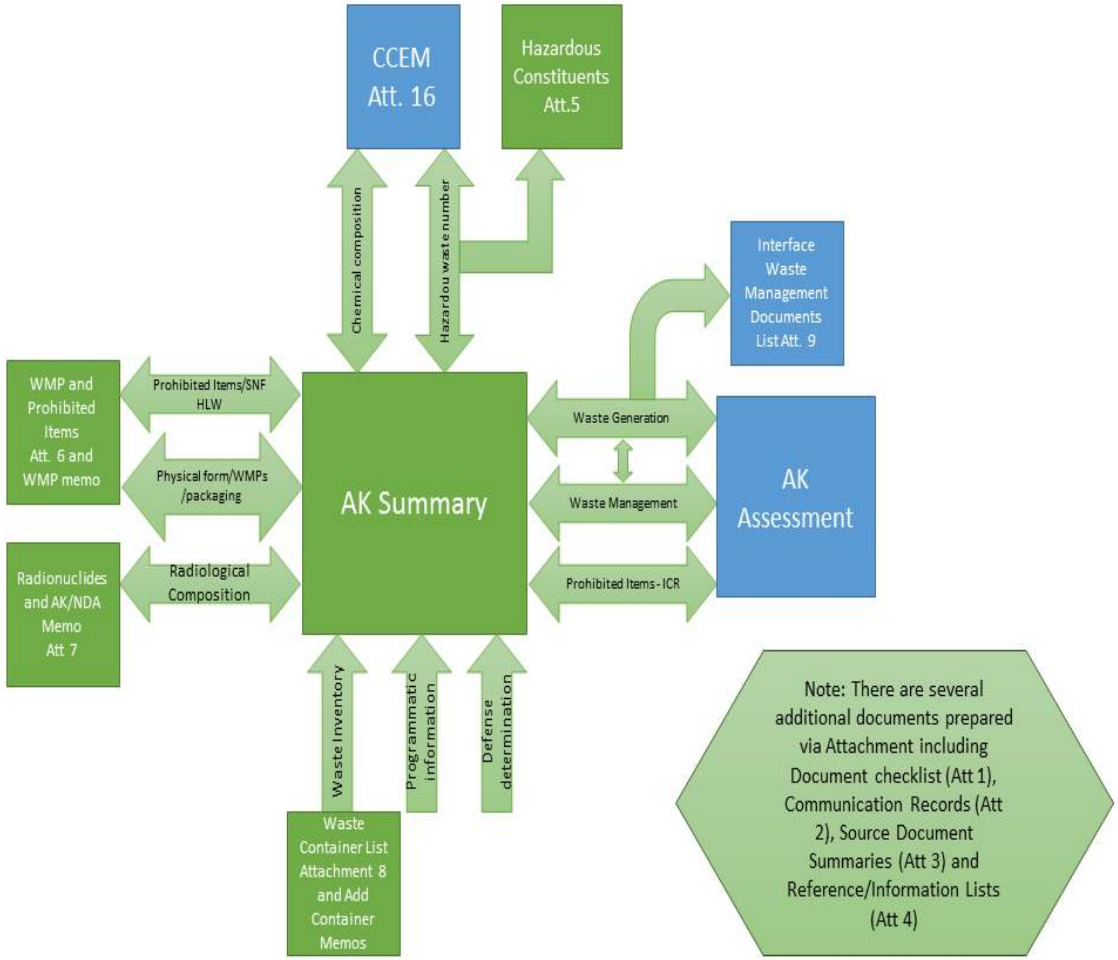

Figure 1: Relationship of AK Data and CCP AK Reports. Items in blue are new Enhanced AK documents.

In short, the AKA is intended to document historical procedures that may have impacted waste management and affected waste currently certified and awaiting shipment as well as, for example, stored waste that may have undergone waste management procedures in the past.

- Chemical Compatibility Evaluation Memorandum: This memo is prepared for every waste stream (new and existing) except for those that have been completely disposed of in the subsurface at WIPP. The memo is intended to evaluate the potential for "adverse chemical reactions (e.g., generation of fire, explosion, heat, or fumes) that stem from combining chemicals". To accomplish this and to expand on the evaluations already done as part of AK and the AKA, a chemical compatibility evaluation will be performed based on the method described in the 1980 EPA method EPA-600/2-80-076, "*A Method for Determining the Compatibility of Hazardous Wastes*" (EPA Method). CCP-TP-005 Attachment 16, provides a template for the preparation of a CCEM.
- Basis of Knowledge (BOK) Evaluation: This evaluation requires the review of the Acceptable Knowledge Summary Report to determine the potential for the final waste form to have oxidizing properties, as defined in the BOK document. If the waste form as the potential to have oxidizing properties, then an evaluation to determine if the containers meet the requirements established in the BOK. The results of such an evaluation are documented in a memorandum.

AK data/results are also continually checked and updated by CCP. These documents include but are not limited to:

- Waste Stream Characterization Checklists (CCP-TP-005 Attachment 13) are used to compare the testing results from VE and Radiography, and NDA characterization activities to the waste stream AK. If inconsistencies are noted, the AK is re-evaluated (Attachment 10) and changes are made to the AK documentation if applicable.
- Discrepancy Resolutions (DRs) are issued when there is discrepant AK-AK information. Also, AK discrepancies may be identified during AK source document compilation, review, characterization, confirmation, AKA, CCEM, and re-evaluation activities. DRs are resolved by the AKE. If discrepancies cannot be resolved by CCP, the container(s) in question will be returned to the host site.
- The AK Accuracy Memorandum (CCP-TP-005 Attachment 14) is used to document the percentage of containers reassigned to a new Waste Matrix Code, designated with a HWN assignment different from AK, or inconsistent with anticipated radionuclide composition determined from AK when compared to CCP testing and Permittee confirmation testing results. AK Accuracy reports may be issued for waste stream lots at a minimum, annually.
- AK Re-Evaluations (CCP-TP-005 Attachment 10) are issued when: inconsistencies noted during the process of comparing AK information to characterization results or the initiation of a nonconformance report (NCR) that identifies potential changes to the AK of a waste stream (including NCRs generated as a result of discrepancies identified during confirmation performed by the Permittee).

AK Briefings are also offered by CCP AKEs to ensure that CCP characterization personnel involved are trained to the following for a given waste stream:

- Mission and generating facility information, including process(es) generating the waste
- Waste stream description and information, including description of physical waste composition, waste matrix parameters, waste matrix code
- Radiological characteristics
- Chemical characteristics
- Suspected prohibited items
- Waste packaging

Note: Briefing updates are prepared and provided when AK Summary Report Revisions are made when changes to waste stream physical/chemical/radiological composition occur, and will include discussion of the IWMDL.

Appendix B - Chapter 18 of the WIPP Documented Safety Analysis (DSA) and DOE Accident Board Findings

The DSA addresses the WIPP Waste Acceptance Criteria Compliance Program. DSA Chapter18 states, "[S]everal new activities and process enhancements were established after the 2014 Radiological Release Event." Specifically, enhanced AK was identified, which includes the following:

- Interface Waste Management Document List (IWMDL), which is a list of documents governing waste management and packaging activities at generator sites and associated procedure walk down.
- The chemical compatibility evaluation memorandum, (CCEM) written by the Certified Programs using procedural requirements based on the method described in the 1980 EPA method EPA-600/2-80-076, *A Method for Determining the Compatibility of Hazardous Wastes* (EPA Method).
- The Basis of Knowledge Document will be provided by the Carlsbad Field Office (CBFO) and implemented in conjunction with the AK procedures of the Certified Programs. The Basis of Knowledge Document will specify when waste with oxidizing chemicals is acceptable as is, or when treatment will be required along with the treatment that must be performed.
- DSA Chapter 18 also states that "All currently certified waste containers in the complex as well as those containers continuing to be certified will undergo the following prior to shipment: 1) Certified Program will implement an enhanced AK process including an enhanced chemical compatibility evaluation for the waste streams, or waste stream sub-populations, and submits to CBFO for review; and 2) Certified Programs will implement the Basis of Knowledge document in the AK process for evaluating oxidizing chemicals in TRU waste streams to determine acceptability or need for treatment."

- The DOE Accident Investigation Board (AIB) identified Judgement of Needs (JONs) related to acceptable knowledge including but not limited to:

  - **JON 1**: The National Transuranic (TRU) Program needs to re-evaluate and strengthen the flow down of requirements regarding the compilation of Acceptable Knowledge (AK) in order to more clearly demonstrate that the WIPP HWFP, Attachment C, WAP waste characteristics prohibitions and chemical compatibility requirements are met consistent with 40 CFR 261.21.
  - **JON 2**: The National TRU Program needs to reevaluate and strengthen the certification audit process across the DOE complex at all generator sites to include:

    - Evaluation of waste generator repackaging operations that prepare TRU waste for characterization;
    - Implementation of waste generator site processes as they relate to TRU waste management;

    - Verification that changes to processes are correctly incorporated into acceptable knowledge summary reports;
    - Verification of effective implementation documentation and programs to ensure that
    - waste generator activities comply with the generator site Resource Conservation and
    - Recovery Act (RCRA) permit; and
    - Evaluation of local site office oversight of TRU waste operations.

- **JON 3**: NA-LA oversight of characterization and certification of TRU waste sites needs to be improved to include:

    - Waste Characterization, Reduction, and Repackaging Facility (WCRRF) repackaging operations that prepare TRU waste for characterization;
    - Implementation of waste generator site processes as they relate to TRU waste management; and
    - Verification that waste generator activities comply with the generator site Resource Conservation and Recovery Act (RCRA) permit.

- **JON 4**: The CBFO oversight of characterization and certification of TRU waste sites needs to be improved to include:

    - Waste generator repackaging operations that prepare TRU waste for characterization;
    - Implementation of waste generator site processes as they relate to TRU waste management;
    - Verification of effective implementation documentation and programs to ensure that waste generator activities comply with the generator site Resource Conservation and Recovery Act (RCRA) permit; and
    - Evaluation of local site office oversight of TRU waste operations.

- **JON 7:** The Central Characterization Program (CCP) needs to improve implementation of requirements in CCP-PO-001 such that characterization methods are able to ensure that all WIPP Waste Acceptance Criteria (WAC) requirements are met.
- **JON 8**: The CCP needs to improve the level of rigor in reviewing and approving AK summary reports for compliance with requirements.
- **JON 12**: The Central Characterization Program (CCP) needs to reevaluate and strengthen the process used to conduct review and approval of source documents that have an impact on Acceptable Knowledge.

- The DOE recently revised the WIPP Waste Acceptance Criteria (Revision 8.0, Effective Date: July 5, 2016) that, once implemented, addresses enhanced AK as follows in Appendices H and I:

- **H.1:** After the 2014 radiological release event, several new activities and process enhancements were established. One of these enhancements was to provide additional controls over the collection, verification, and validation of AK, thus resulting in a more robust AK program referred to as Enhanced Acceptable Knowledge (Reference 4, Chapter 18.4.2.1). Use of these newly established controls by the WCPs is expected to ensure the receipt of WIPP WAC compliant waste containers.
- **H.2 Interface Waste Management Documents List (IWMDL)** The IWMDL, which is generated by the WCP, identifies DOE site plans, procedures, and reports associated with current waste management and packaging (e.g., waste management, waste generation, waste treatment, waste packaging, waste repackaging, waste remediation, waste stream delineation, and waste characterization procedures) to be reviewed before containers are added to the Waste Containers List or Container Tracking Spreadsheet in order to continue characterization activities. TRU waste will not be provided to the WCP until the IWMDL is updated with the latest version of the procedure…
- **H.3 Certified Program Enhanced Chemical Compatibility Evaluation**
- As part of the process for characterizing and certifying TRU waste for disposal at WIPP, it is necessary to consider the range of possible chemical combinations that could occur in each waste stream. Potential adverse chemical reactions (e.g., generation of heat, fire, explosion, or toxic fumes) that stem from combining potentially incompatible chemicals must be evaluated to support safe and compliant waste management. To expand upon this evaluation, chemical compatibility has been enhanced to require formal documentation and generation of a chemical compatibility evaluation memo (CCEM) for the waste stream, or sub-population of the waste stream, as needed. The CCEMs are written by the WCPs using procedural requirements based on the method described in the 1980 EPA method EPA-600/2-80-076, “A Method for Determining the Compatibility of Hazardous Wastes” (EPA Method). The CCEM will document and communicate the evaluation including the conclusions. CCEMs concluding the potential for chemical incompatibility will provide the basis for placing an administrative hold on the affected waste via issuance of a nonconformance report (NCR). CCEMs concluding the potential for chemical incompatibility are provided to the CBFO for information only…
- **H.4 Basis of Knowledge for Evaluating Oxidizing Chemicals in TRU Waste.** The Basis of Knowledge Document will be provided by CBFO and implemented in conjunction with the AK procedures of the WCPs. The Basis of Knowledge Document will specify when waste with oxidizing chemicals is acceptable as is, or when treatment will be required along with the treatment that must be performed…
- **H.5 Certified Program Acceptable Knowledge Assessments.** To ensure that the AK documentation relating to the management of potentially reactive, corrosive, ignitable, and incompatible TRU waste materials is adequate, current, and accurately described in existing AK Summary Reports, a onetime AK assessment will be performed for waste streams having a currently certified container in a waste stream that has a population of unshipped containers.

- **H.6 AK Briefings. A**K Briefing updates are required when the AK Summary Report requires revision due to changes in the waste stream characteristics (physical, chemical, or radiological composition) or packaging configuration. Include a discussion of the waste management and packaging activities verified during preparation of the current Interface Waste Management Documents list prepared for the waste stream. The AKE/SPM must emphasize the importance of maintaining current procedures in the AK record. AK Briefings are prepared and presented the generator POCs/SMEs, or cognizant designees. The participation of these site representatives from the groups directly involved with the generation, characterization, and management of containers in the waste stream will further ensure that the description of the waste streams in the AK Summary Reports are complete and accurate.
- **Appendix I** states that for all <u>currently certified waste</u> containers in the complex following prior to shipment:

    - Certified Program will implement an enhanced AK process including an enhanced chemical compatibility evaluation for the waste streams, or waste stream sub-populations, and submits to CBFO for review.
    - Certified Programs will implement the Basis of Knowledge document in the AK process for evaluating oxidizing chemicals in TRU waste streams to determine acceptability or need for treatment.
    - CBFO will concur with enhanced chemical compatibility evaluation and implementation of the Basis of Knowledge for the evaluated waste stream.
    - CBFO will approve waste streams with acceptable enhanced chemical compatibility evaluation documentation provided by the Certified Programs.