

ATTACHMENT C6
AUDIT AND SURVEILLANCE PROGRAM

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ATTACHMENT C6

AUDIT AND SURVEILLANCE PROGRAM

C6-1 Introduction

The Waste Isolation Pilot Plant (**WIPP**) Audit and Surveillance Program shall ensure that: 1) the operators of each generator/storage site (**site**) that plan to transport transuranic (**TRU**) mixed waste to the WIPP facility conduct testing of wastes in accordance with the current WIPP Waste Analysis Plan (**WAP**) (Permit Attachment C), and 2) the information supplied by each site to satisfy the waste screening and acceptability requirements of Permit Attachment C, Section C-4 of the WAP is being managed properly. The U.S. Department of Energy (**DOE**) will conduct these audits and surveillances at each site performing these activities in accordance with a standard operating procedure (**SOP**). The New Mexico Environment Department (**NMED**) personnel may observe these audits and surveillances to validate the implementation of WAP requirements at each site. As specified in Permit Part 2, Section 2.3.2.2, the NMED will be invited to the daily audit team caucus as observers. Only personnel with appropriate DOE clearances will have access to classified information during audits. Classified information will not be included in audit reports and records. The audit SOP will contain steps for selecting audit personnel, reviewing applicable background information, preparing an audit plan, preparing audit checklists, conducting the audit, developing an audit report, and following up audit deficiencies. A deficiency is any failure to comply with an applicable provision of the WAP. The checklists for each site shall include, at a minimum, the appropriate checklists found in Tables C6-1 through C6-4 for the summary category groups undergoing audit.

The Permittees will provide a proposed annual generator/storage site audit schedule for the upcoming calendar year to the NMED, by October 1, for written approval by NMED within 90 days of receipt. Any subsequent changes to the annual schedule proposed by the Permittees will be promptly submitted to the NMED for approval. The Permittees will consider the following criteria for developing the annual audit schedule:

- initial audits if any required,
- replacement of the contracting organization performing the TRU waste management,
- new Permit-related waste characterization activities (e.g., new radiography or VE processes),
- changes in waste types or forms (e.g., additional Summary Category Groups not previously approved by the NMED),
- quantity of waste being characterized,
- unexpected issues and events, and
- input received from the NMED.

Before the Permittees begin the process of accepting TRU mixed waste from a generator/storage site, an initial audit of that generator/storage site will be conducted as part of the Audit and Surveillance Program. Each generator/storage site shipping TRU mixed waste to the WIPP facility must be audited at least annually. However, specific small quantity generator/storage sites (limited to Argonne National Laboratory, Sandia National Laboratories, Lawrence Livermore National Laboratory, and/or Idaho National Laboratory-Central Characterization Program) may be audited at a reduced frequency of every two years provided the Permittees submit, for NMED approval, a risk-based graded approach analysis using the

above criteria for each site, demonstrating how the site will effectively implement and comply with applicable requirements of the WAP.

C6-2 Audit Procedures

Audit procedures shall establish the responsibilities and methodology for planning, scheduling, performing, reporting, verifying, and closing announced and unannounced audits of sites. Records of audit activities shall be part of the WIPP Operating Record and maintained at the WIPP facility until closure. The NMED shall be provided unlimited access to these records.

Approved SOPs shall be used to describe audit activities and requirements. These SOPs define the responsibilities of specific positions necessary to manage this audit program. The DOE manager who oversees the audit program shall ensure that the following tasks are performed:

- Schedule audits
- Designate lead auditor(s)
- Appoint auditor and lead auditor trainees
- Maintain auditor training and qualification records
- Assure that auditors have been given appropriate training, including training on the WAP
- Assign auditors and lead auditors to perform certification audits
- Review and approve final audit reports
- Oversee tracking and closure of deficiencies and any observations requiring action
- Assure records are entered into the WIPP Operating Record and are properly maintained until facility closure

C6-3 Audit Position Functions

The DOE will approve lead auditors, auditors, and technical specialists based upon the expertise required for the functions being examined according to the audit scope. The DOE will supply auditors/technical specialists with expertise in the Resource Conservation and Recovery Act (**RCRA**) requirements and knowledge of the testing and documentation methods required to verify the hazardous waste characterization performed by the sites. The DOE shall identify audit team members to the NMED prior to the audit and shall provide upon request the qualifications of audit team members.

The lead auditor assigned to be the audit team leader must perform the following tasks:

- Concur that assigned auditors and technical specialists have the collective experience and training commensurate with the scope, complexity, or special nature of the activities to be audited

- Develop an audit plan and coordinate the preparation of an overall checklist to cover the scope of the audit, with consideration given to nonconformances reported as specified in Permit Attachment C3 and to previous audit results from that site
- Assign specific audit areas to individual auditors and technical specialists within their particular specialty and provide guidance on checklist development
- Review individual auditor checklists to assure complete coverage of assigned scope, and approve the checklists
- Conduct the audit at the site
- Encourage observers to participate according to the protocol established by the DOE
- Communicate audit results at the conclusion of the audit, including any deficiencies and observations
- Prepare and sign the audit report
- Maintain complete records of each audit and transfer them to the DOE manager when the audit report is issued

Auditors and technical specialists assigned to the specific audit will report to the audit team leader for supervision and may perform the following tasks:

- Attend any required specific training and team orientation and planning meetings as directed by the audit team leader
- Prepare specific audit checklists to verify that the WAP Quality Assurance Objectives (**QAOs**) are met for the areas being audited
- Obtain audit team leader approval of checklist
- Review acceptable knowledge (**AK**) documentation packages, test report data, and documentation of data verification activities
- Obtain and evaluate objective evidence by means of observation, document reviews, or the conduct of interviews with operators, technicians, and others necessary to determine the adequacy and effective implementation of the WAP
- Conduct inspection tours of waste generating station, waste testing facilities, calibration facilities, administrative, and document control/record facility
- Complete checklist during the audit indicating the objective evidence observed verifies that the site has met the QAOs for the program elements, methods, and the activities being audited; add other items to the checklist as they are observed or as needed during the audit

- Prepare narrative statements that clearly and concisely identify the conditions involved regarding deficiencies and observations
- Prepare any portion of the final audit report assigned by the lead auditor

Audits will be conducted at each site involved in the waste characterization program. Both announced and unannounced audits will address the following:

- Results of previous audits
- Changes in programs or operations
- New programs or activities being implemented
- Changes in key personnel

Certification and recertification audits shall address contact-handled (**CH**) and remote-handled (**RH**) waste characterization activities if the site has approval or is seeking approval for such wastes. At a minimum, the audit shall evaluate AK documentation for CH and RH waste separately by Summary Category Group, as applicable.

C6-4 Audit Conduct

The conduct of the audit shall commence with an entrance meeting, conducted by the audit team leader, with site management. At this meeting, the audit objectives and scope, the specific areas to be audited, the processes or functions to be observed, and the site participation required, including site interfaces, will be identified. The purpose of this meeting is to confirm the audit scope, discuss the audit sequence, establish channels of communication, and confirm the daily and exit meeting. Audits shall be performed using approved audit checklists that include the checklists in Tables C6-1 to C6-4 for the summary category groups undergoing audit. Consistency of evaluation shall be ensured before the audit through site QAPjP approval (see Permit Attachment C5). The QAPjPs for each site shall incorporate the same requirements from the WAP. Objective evidence shall be examined (to the depth necessary) to determine if the identified activities, procedures, or QAOs are adequate and are being effectively implemented.

Audits may not include all waste summary category groups, and thus some audit checklists or portions of checklists (Tables C6-1 through C6-4) may not be applicable to some sites (e.g., approved AK sufficiency determination request for one or more waste streams at a site). In these instances, DOE shall indicate non-applicability in the appropriate checklist row, and justify the exclusion under the "Comment" column. In addition, in cases where discrepancies exist between the audit checklists in Tables C6-1 through C6-4 and the Permit, Permit requirements take precedence. The DOE may add to the checklists as necessary to clarify Permit requirements, but any additions will be clearly designated on the checklists (i.e., redline the additions).

Audits shall include site personnel interviews, document and record reviews, observations of operations, and any other activities deemed necessary by the auditors to meet the objectives of the audit. Observations or deficiencies identified during the audit will be investigated or evaluated, as necessary, to determine if they are isolated conditions or represent a general breakdown of the waste characterization quality assurance program. During audit interviews or audit meetings, site personnel may be advised of deficiencies identified within their areas of responsibility to establish a clear understanding of the identified condition.

The site personnel will be given the opportunity to correct any deficiency that can be corrected during the audit period. Deficiencies and observations will be documented and included as part of the final audit report. Those items that have been resolved during the audit (isolated deficiencies that do not require a root cause determination or actions to preclude recurrence), will be verified prior to the end of the audit, and the resolution will be described in the audit report. Those items that affect the quality of the program, and/or the data generated by that program, which are required by the WAP will be documented on a Corrective Action Report (**CAR**) and included as a part of the final audit report. The CAR will be entered into the DOE's CAR tracking system and tracked until closure. Resource Conservation and Recovery Act related items will be uniquely identified within the CAR tracking system so that they can be tracked separately. Resource Conservation and Recovery Act related CARs identified by the site during self-audits will be evaluated during the DOE's audit and surveillance program and tracked in the DOE's CAR tracking system.

When a deficiency is identified by the audit team, the audit team member who identified the deficiency prepares the CAR. The DOE reviews the CAR, determine validity (assures that a requirement has in fact been violated), classify the significance of the deficiency, assign a response due date, and issue the CAR to the site. The site reviews the CAR, evaluates the extent and cause of the deficiency, and provides a response to the DOE indicating the remedial actions and actions taken to preclude recurrence. The DOE reviews the response from the site and, if acceptable, communicate the acceptance to the site. The site completes remedial actions and actions to preclude recurrence. After corrective actions have been completed, DOE may schedule and perform a verification visit to assure that corrective actions have been completed and are effective. NMED personnel may participate as observers in these verification visits. When actions have been completed and verified as being effective, the CAR is closed by the DOE manager responsible for quality assurance. As part of the planning process for subsequent audits and surveillances, past deficiencies will be reviewed and the previous deficient activity or process is subject to reassessment.

The NMED may submit a written Observer Inquiry to the DOE if necessary to seek resolution to a question raised or issue posed during the audit. The DOE shall be responsible for obtaining a response to the Observer Inquiry and submitting a written response to the NMED within 30 days of inquiry submission. The NMED will examine the response and consider this information as part of the audit review and approval process.

The sites shall submit corrective action plans to eliminate the deficiency stated on the CAR, including a resolution of the acceptability of any data generated prior to the resolution of the corrective action.

The corrective action response will include a discussion of the investigation performed to determine the extent and impact of the deficiency, a description of the remedial actions taken, determination of root cause, and actions to preclude recurrence.

An exit meeting will be conducted by the lead auditor prior to departure of the audit team from the site. This meeting will include site management personnel and may include DOE field office personnel. Draft audit results will be presented to the site management.

The audit report will be prepared, approved, and issued to the site within 30 days of the completion of the audit by the DOE. The NMED shall receive a copy of the audit report upon issuance for information purposes. A formal final audit report will be provided to the NMED

which will include WAP-related CAR resolution results and audit results that will include, as a minimum, sections describing the scope, purpose, summary of deficiencies, and observations in narrative format, completed audit checklists, audited procedures, and other applicable documents which provide evidence of WAP implementation. The report will also include an identification of the organization audited, the dates of the audit, and the requested response date. NMED will make the final audit report available for public review and comment. One copy of the formal final audit report shall be submitted to the NMED in hard copy, but any additional copies may be submitted in electronic format. The audited site will respond to any deficiencies and observations within (30 days after receipt of any CARs and indicate the corrective action taken or to be taken. If the corrective action has not been completed, the response must indicate the expected date the action will be completed. The CARs applicable to WAP requirements shall be resolved prior to waste shipment. Subsequent audits or specific verifications, announced or unannounced, will determine if the corrective action has been satisfactorily implemented. Deficiencies (items corrected during the audit (**CDAs**) and CARs) and observations will be tracked to completion according to established procedure(s). In addition, deficiencies will be trended to determine if similar situations exist system wide. Trend reports will be issued as necessary to provide a “lessons learned” announcement to other sites who might benefit from program improvements implemented as a result of resolutions to the specific situations discovered at the performance of these audits.

Generator Site Technical Reviews shall be completed at each generator storage site shipping waste to WIPP on a schedule based on WIPP Standard Operating Procedures. The Permittees will provide a proposed annual GSTR schedule for the upcoming calendar year to the NMED, by October 1, for approval by NMED within 90 days of receipt. Any subsequent changes to the annual schedule proposed by the Permittees will be promptly submitted to the NMED for approval. The Permittees will consider the following for developing the annual schedule and for determining which generator storage site(s) require GSTR:

- replacement of the contracting organization performing the TRU waste management,
- new waste processing activities (e.g., additional remediation capabilities or treatment methods),
- site organizational changes,
- changes in waste types or forms,
- unexpected issues and events, and
- input received from the NMED.

A section specific to GSTRs must be included in the final audit report for the site, stating whether a GSTR has been conducted since the previous audit and the status of any WAP-related issues identified.

The final audit report provided to the NMED and audit records will be maintained at the WIPP facility as a part of the Operating Record. These records will be included on the Record Inventory and Disposition Schedule and maintained on-site until closure of the WIPP facility. The NMED shall be provided unlimited access to these records.

TABLES

**Table C6-1
 Waste Analysis Plan (WAP) General Checklist for use at DOE'S Generator/Storage Sites**

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Waste Stream Identification						
1	Does the generator/storage site define "waste stream" as waste materials that have common physical form, that contain similar hazardous constituents, and that are generated from a single process or activity? (Section C-0a)					
2	Are procedures in place to ensure that the generator/storage site assigns one of the Summary Category Groups (S3000-homogeneous solids, S4000-soils/gravel, S5000-debris waste) to each waste stream? (Section C-1b)					
3	Are procedures in place to ensure that the generator/storage site assigns Waste Matrix Code Subgroups Groups (e.g., solidified inorganics, solidified organics, salt waste, soils, combustible waste, filters, graphite, heterogeneous debris waste, inorganic nonmetal waste, lead/cadmium metal, uncategorized metal) to each waste stream? (Section C-0a)					
4	Are procedures in place to ensure that the generator/storage site assigns a Waste Stream WIPP Identifier (ID) to each waste stream? (Section C3-6b(1))					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
4a	<p>Are procedures in place for generator/storage sites to submit an AK Sufficiency Determination (Determination Request) to the Permittees to meet the waste characterization requirements including:</p> <ul style="list-style-type: none"> • Information specified in Permit Attachment C4, Section C4-3d • Identification of relevant hazardous constituents, and correctly identifies toxicity characteristic and listed hazardous waste numbers • Hazardous waste number assignments must be substantiated by supporting data and, if not, whether this lack of substantiation compromises the interpretation • Resolution of data discrepancies between different AK sources must be technically correct and documented • The AK Summary includes the identification of waste material parameter weights by percentage of the material in the waste stream, and determinations are technically correct • Prohibited items specified in the TSDF-WAC should be addressed, and conclusions drawn are technically adequate and substantiated by supporting information • If the AK record includes process control information specified in Permit Attachment C4, Section C4-3b, the information should include procedures, waste manifests, or other documentation demonstrating that the controls were adequate and sufficient. • The site must provide the supporting information necessary to substantiate technical conclusions within the Determination Request, and this information must be correctly interpreted. <p>(Section C-0b, Section C4-3d)</p>					
4b	<p>If a generator/storage site does not submit a Determination Request or if the Determination Request is not approved, are procedures in place for the generator/storage site to perform radiography or VE on 100 percent of the containers in a waste stream as specified in Permit Attachment C1?</p> <p>(Section C-0b)</p>					
4c	<p>Are procedures in place to ensure that the generator/storage sites complete a Waste Stream Profile Form (WSPF) and Characterization Information Summary (CIS) as specified in Permit Attachment C3, Sections C3-6b(1) and C3-6b(2)?</p> <p>(Section C-0c)</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
6	Are procedures in place to ensure that the generator/storage site assigns EPA hazardous waste numbers associated with the waste? If so, do these assigned EPA hazardous waste numbers correspond to the permitted EPA hazardous waste numbers in Table C-5? Are there any assigned EPA hazardous waste numbers that are not permitted EPA hazardous waste numbers on the Table C-5? If so, did the generator/storage site reject the waste for shipment to and disposal at the WIPP facility? Did the generator assign a state hazardous waste codes or numbers? If so, is it assigned to waste that is permitted at the WIPP facility? (Section C-1b)					
7	Are procedures in place to ensure that Summary Category Groups are defined as follows: S3000- Homogeneous solids are solid material, inorganic process residues, inorganic sludges, salt waste, and pyrochemical salt waste excluding soils, that do not meet NMED criteria for classification as debris and are at least 50 percent by volume homogeneous solids or comprise the majority of the waste stream S4000- Waste streams that are at least 50 percent by volume soil/gravel, or comprise the majority of the waste stream S5000- Waste streams that are at least 50 percent volume materials that meet the NMED criteria for debris, or comprise the majority matrix of materials. The criteria for debris are solid materials intended for disposal that exceed 2.36 inch particle size and is a manufactured object, plant or animal matter, or natural geologic material. Particles smaller than 2.36 inches in size may be considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material. (Section C-0a)					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
8	<p>Does the generator/storage facility have procedures in place to ensure that the following waste characterization parameters will be obtained::</p> <ul style="list-style-type: none"> • Determination whether TRU mixed waste streams comply with the applicable provisions of the TSDF-WAC • Determination whether TRU mixed wastes exhibit a hazardous characteristic per 20.4.1.200 NMAC (incorporating 40 CFR 261 Subpart C) • Determination whether TRU mixed wastes are listed per 20.4.1.200 NMAC (incorporating 40 CFR 261 Subpart D) • Estimation of waste material parameter weights <p>(Section C-2)</p>					
9	<p>Are procedures in place to ensure that waste streams identified to contain incompatible materials or materials incompatible with waste containers cannot be shipped unless treated to remove the incompatibility? (Section C-1c)</p>					
10	<p>Are procedures in place to ensure that the generator/storage site uses AK and, as necessary, radiography and VE analysis as specified in Table C-1? (Section C-3)</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Unacceptable Waste						
12	<p>Are procedures in place to ensure that the generator/storage site ensures, through administrative and operational procedures and characterization techniques, that waste containers do not include the following unacceptable waste:</p> <ul style="list-style-type: none"> • liquid waste is not acceptable for disposal at the WIPP facility. Liquid in the quantities delineated below is acceptable <ul style="list-style-type: none"> • Observable liquid shall be no more than one percent by volume of the outermost container at the time of radiography or VE • Internal containers with more than 60 milliliters or three percent by volume observable liquid, whichever is greater, are prohibited • Containers with Hazardous Waste Number U134 assigned shall have no observable liquid • Overpacking the outermost container that was examined during radiography or VE or redistributing untreated liquid within the container shall not be used to meet the liquid volume limits • non-radionuclide pyrophoric materials • hazardous wastes not occurring as co-contaminants with TRU wastes (non-mixed hazardous wastes) • wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes • wastes containing explosives or compressed gases (continued below) 					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
12a	<ul style="list-style-type: none"> wastes with polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003) waste that has ever been managed as high-level waste and waste from tanks specified in Permit Attachment C, Table C-4, unless specifically approved through a Class 3 permit modification any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or VE of a statistically representative subpopulation of the wastes stream in each shipment pursuant to Permit Attachment C7 any waste container from a waste stream which has not been preceded by an appropriate, certified Waste Stream Profile Form (see Section C-1d) (Section C-1c)					
Waste Acceptance Control						
14	Are procedures in place to ensure that the generator/storage site uses a WSPF which includes, at a minimum, the information indicated on the attached WSPF found in Permit Attachment C, Figure C-1 and a CIS prior to waste disposal at the WIPP? (Section C-1d)					
16	Are procedures in place to ensure that additional WSPFs are provided to WIPP and NMED for waste streams or portions of waste streams that are reclassified based upon waste characterization information? (Section C-1d)					
16a	Are criteria in place to determine the specific circumstances under which a WSPF is revised versus when a new WSPF is required? (Section C-1d)					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
General Characterization Requirements						
24	<p>Are procedures in place to ensure that a Generator Site Technical Review (GSTR) is performed based on the schedule approved by NMED annually and that the following is ensured:</p> <ul style="list-style-type: none"> • any issues identified the most recent GSTR are being tracked to closure • the current status of any issues identified is available • the most recent GSTR final report is available for inclusion in the final audit report <p>(Section C6-4)</p>					
25	<p>Are procedures in place to ensure that AK is used in waste characterization activities to delineate TRU mixed waste streams, to assess whether TRU mixed wastes comply with the TSDF-WAC, to assess whether TRU mixed waste exhibits a hazardous characteristic (20.4.1.200 NMAC, incorporating 40 CFR 261 Subpart C), and to assess whether TRU wastes are listed (20.4.1.200 NMAC, incorporating 40 CFR 261 Subpart D), and to estimate waste material parameter weights? (Section C-3a)</p>					
26	<p>Are procedures in place to ensure that radiography and/or VE are used as necessary to:</p> <ul style="list-style-type: none"> • Examine a waste container to determine the physical form • Identify observable liquid in excess of TSDF-WAC limits and containerized gases • Verify the physical form matches the waste stream description <p>(Section C-3b)</p>					
28	<p>Are procedures in place to ensure that the following characterization activities shall occur:</p> <ul style="list-style-type: none"> • Acceptable Knowledge for wastes, with testing as necessary to augment AK including; <ul style="list-style-type: none"> - Visual examination or radiography for waste containers <p>(Section C4-3e)</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Data Generation, Verification, Validation, Documentation, and Quality Assurance						
30	<p>Are procedures in place to ensure that the following Data Quality Objectives are met:</p> <ul style="list-style-type: none"> • Use AK to delineate TRU mixed waste streams, assess whether TRU mixed wastes comply with the applicable requirements of the TSDF-WAC, assess whether TRU mixed wastes exhibit a hazardous characteristic, assess whether TRU mixed wastes are listed and to estimate waste material parameter weights • Use radiography or VE to verify the physical form of the waste matches its waste stream description as determined by AK and to verify the absence of prohibited items <p>(Section C-4a(1))</p>					
31	<p>Are procedures in place to ensure that the following Quality Assurance Objectives are adequately defined and assessed for each characterization method:</p> <ul style="list-style-type: none"> • Precision as a measure of the mutual agreement among multiple measurements. • Accuracy as the degree of agreement between a measurement result and a true or known value. • Completeness is a measure of the amount of valid data obtained from a method compared to the total amount of data obtained that is expressed as a percentage. • Comparability is the degree to which one data set can be compared to another data set. • Representativeness as an expression of the degree to which data represent characteristics of a population. <p>(Section C-4a(2))</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
32	With respect to data generation, are procedures in place to ensure that the generator/storage site's waste characterization program meets the following general requirements: <ul style="list-style-type: none"> • Testing data packages and BDRs must be reported accurately in a pre-approved format, must be maintained in permanent files, and must be traceable? • Data must receive a technical review by another qualified operator? (Section C3-4a)					
33	Are procedures in place to ensure that the generator/storage site performs validation of waste characterization data for each waste container? (Section C-4)					
34	Are procedures in place to ensure that the generator/storage site has a pre-approved format for reporting waste characterization data? (Section C-4a(3))					
35	Are procedures in place to ensure that the generator/storage site prepares testing BDRs to meet the requirements of their own site-specific QAPjP and/or SOPs? (Section C-4a(3))					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
36	<p>Are procedures in place to ensure that raw data is collected and managed at the data generation level in accordance with the following criteria:</p> <ul style="list-style-type: none"> • Raw data shall be signed and dated in reproducible ink by the individual collecting the data, or signed and dated using electronic signatures • Data shall be recorded clearly, legibly, and accurately in field records • Changes to original data shall be lined out, initialed, and dated by the individual making the change. Original data may not be obliterated or otherwise be made unreadable • Data shall be transferred and reduced from field records completely and accurately • Field records shall be maintained as specified in Table C-2 of Attachment C • Data shall be organized into standard reporting formats for reporting purposes. • Electronic and video data must be stored to ensure that waste container and QC data are readily retrievable <p>(Section C3-4a)</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
37	<p>Are procedures in place to ensure that 100 percent of BDRs are subject to independent technical review by an individual qualified to review the data who was not involved in the generation or recording of the data under review. The reviewer shall release the data through signature with an associated review checklist prior to characterization of the associated waste and shipment to the WIPP facility. The review shall ensure the following, as applicable:</p> <ul style="list-style-type: none"> • Data generation and reduction were conducted according to the methods used and reported in the proper units and significant figures • Calculations have been verified by a valid calculation program, a spot check of verified calculation programs, and/or a 100 percent check of hand calculations • The data have been reviewed for transcription errors • The testing QA documentation for BDRs is complete and includes, as applicable, raw data, calculation records, calibration records • Radiography tapes are reviewed on a waste container basis at a minimum of once per testing batch or once per day of operation, whichever is less frequent. The radiography tape will be reviewed against the data on the radiography form to ensure that data are complete and correct • QAOs have been met <p>(Section C3-4a(1))</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
40	<p>Are procedures in place to ensure that 100 percent of BDRs receive a Site Project Manager (SPM) signature release with an associated review checklist prior to characterization of the associated waste and shipment to the WIPP. This release shall ensure the following:</p> <ul style="list-style-type: none"> • Testing batch QC checks were properly performed. Radiography data are complete and acceptable based on evidence of videotape review of one waste container per day or once per testing batch, whichever is less frequent • Data generation level independent technical review, validation, and verification have been performed as evidenced by the completed review checklists and appropriate signature releases. • Independent technical reviewers were not involved in the generation or recording of the data under review. • Batch Data review checklists are complete • Batch Data Reports are complete and data properly reported • Verify that data are within established data assessment criteria and meet applicable QAOs <p>(Section C3-4b(1))</p>					
42	<p>Are procedures in place to ensure that a repeat of the data review process at the data generation level will be performed on a minimum of one randomly chosen waste container every quarter to determine if the verification and validation is performed according to documented procedures? (Section C3-4b)</p>					
43	<p>Are procedures in place and checklists available to prepare a SPM Summary and a Data Validation Summary (the summaries may be in the same document)? The SPM Summary includes a validation checklist for each batch that is of sufficient detail to document aspects of a BDR that could affect data quality. The Data Validation Summary must identify each BDR reviewed, describe how the validation was performed, identify problems, and identify acceptable and unacceptable data. Summaries must include release signatures. (Section C3-4b(2))</p>					
44	<p>Are procedures in place to ensure that non-administrative, WAP-related nonconformances first identified at the SPM level are reported to the Permittees within seven calendar days of identification, nonconformance reports are prepared within 30 calendar days, and corrective action is implemented prior to waste shipment? (Section C3-7)</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
45	Are procedures in place to ensure that any waste container for which a nonconformance report (NCR) has been written will not be shipped to the WIPP facility unless the condition that led to the NCR for that container is appropriately identified, reconciled, corrected, and documented? Are nonconformance reports prepared for nonconformances identified? Are nonconformances identified and tracked, and does the SPM oversee the nonconformance report process? (Section C3-7)					
Data Transmittal						
48	Are procedures in place to ensure that the generator/storage site transmits data by hard copy or electronic copy from the data generation level to the site project level? If electronic, does the generator/site have a hard copy available on demand? (Section C-4a(5))					
50	Are procedures in place to ensure that the generator/storage site inputs the data into the WWIS manually or electronically? (Section C-4a(5))					
51	Are procedures in place to ensure that the generator/storage site enters the data into the WWIS in the exact format required by the database? (Section C-4a(5))					
52	Are procedures in place to ensure the data presented on Table C-3 of the Permit is transmitted to the WWIS? (Table C-3)					
Records and Record Management						
55	Are procedures in place to ensure that the generator/storage site's hard copy and/or electronic data reports follow the Permittees' format requirements? (Section C-4a(3))					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
56	<p>Are procedures in place to ensure that hard copy or electronic Waste Stream Profile Form will include the following</p> <ul style="list-style-type: none"> • Generator/storage site name • Generator/storage site EPA ID • Date of audit report approval by the NMED (if obtained) • Original generator of waste stream • Whether waste is contact-handled or remote-handled • Waste Stream WIPP Identification Number • Summary Category Group • Waste Matrix Code Group • Waste Material Parameter Weight Estimates per unit of waste • Waste stream name • A description of the waste stream • Applicable EPA hazardous waste numbers • Applicable TRUCON codes • A listing of AK documentation used to identify the waste stream • The waste characterization procedures used and the reference and date of the procedure • Certification signature of SPM, name, title, and date signed <p>(Section C3-6b(1))</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
56a	<p>Are procedures in place to ensure that hard copy or electronic Characterization Information Summary will include the following:</p> <ul style="list-style-type: none"> • Data reconciliation with DQOs • Radiography and VE summary to document that prohibited items are absent in the waste and to verify that the physical form of the waste matches its waste stream description as determined by AK (if applicable). • A complete listing of container identification numbers used to generate the WSPF, cross-referenced to each BDR. • Complete AK summary, including stream name and number, point of generation, waste stream volume (current and projected), generation dates, Summary Category Group, Waste Matrix Code(s) and Waste Matrix Code Group, other TWBIR information, waste stream description, areas of operation, generating processes, RCRA determinations, radionuclide information, references used to generate the AK summary, and any other information required by Permit Attachment C4, Section C4-2b. TRUCON codes are to be included in the WSPF pursuant to Permit Attachment C3, Section C3-6b(1) and may also be included in the AK Summary. • Method for determining Waste Material Parameter Weights per unit of waste. • List of any AK Sufficiency Determinations requested for the waste stream. • Certification through AK or testing that any waste assigned the hazardous waste number of U134 (hydrofluoric acid) no longer exhibits the characteristic of corrosivity. This is verified by ensuring that no liquid is present in U134 waste. • A justification for the selection of radiography and/or VE as an appropriate method of characterizing the waste. <p>(Section C3-6b(2))</p>					
56b	Are procedures in place to assure that ongoing container characterization results are cross referenced to BDRs? (Section C3-6b)					
58	Are procedures in place to ensure that project level reports are compiled into Characterization Information Summaries (Section C3-6b)					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
59	Are procedures in place to ensure that the generator/storage site uses forms for data reporting that are pre-approved forms in site-specific documentation? (Section C3-6)					
60	Are procedures in place to ensure that the generator/storage site's SPM submits to the WIPP facility a summary of the waste stream information and reconciliation with data quality objectives (DQOs) once a waste stream is characterized? (Section C-4a(5))					
61	Are procedures in place to ensure that the generator/storage site project office completes a WSPF based on the BDRs? (Section C3-6b)					
62	Are procedures in place to ensure that the generator/storage site's SPM submits the WSPF to the Permittees for DOE's approval along with the accompanying Characterization Information Summary for that waste stream? (Section C-4a(5))					
63	Are procedures in place to ensure that the generator/storage site maintains records related to waste characterization testing activities in the testing facility files, or site project files for those facilities located on-site? (Section C-4a(6))					
64	Are procedures in place to ensure that the appropriate documented training and indoctrination is performed for individuals and that procedures are documented in site specific QAPjPs and procedures? (Section C3-8)					
66	Are procedures in place to ensure that the generator/storage site has an appropriate records inventory and disposition schedule (RIDS) or equivalent that was prepared and approved by appropriate site personnel? (Section C-4a(6))					
67	Are procedures in place to ensure that the generator/storage site maintains records relevant to an enforcement action, regardless of disposition, until they are no longer needed for enforcement action, and then dispositioned per the approved RIDS? (Section C-4a(6))					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
68	<p>Are procedures in place to ensure that the generator/storage site maintains records that are designated as Lifetime Records for the life of the waste characterization program plus six years, or that the records have been transferred for permanent archival storage to the WIPP Records Archive facility? Lifetime Records include:</p> <ul style="list-style-type: none"> • Test facility BDRs, • Waste Stream Characterization Package, • Data reduction, validation, and reporting documentation, • Acceptable knowledge documentation, • WSPF and Characterization Information Summary <p>(Section C-4a(6), Table C-2)</p>					
69	<p>Are procedures in place to ensure that the generator/storage site maintains records that are designated as Non-Permanent Records for ten years from the date of record generation, and then dispositioned according per the approved RIDS or transferred to the WIPP Records Archive facility?</p> <p>Non-Permanent Records include:</p> <ul style="list-style-type: none"> • Nonconformance documentation, • Variance documentation, • Assessment documentation, • Calculations and related software documentation, • Training/qualification documentation, • QAPjP documentation (including revisions), • Calibration documentation, • Procurement documentation, • Quality Assurance procedures (including revisions), • Technical implementing procedures (including revisions), and • Audio/video recording (radiography, visual, etc.). <p>(Section C-4a(6), Table C-2)</p>					
70	<p>Are procedures in place to ensure that the generator/storage site has raw data that is identifiable and legible, and provides documentary evidence of quality? (Section C-4a(6))</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
71	Are procedures in place to ensure that if the generator/storage site ceases to operate, that records be transferred before closeout? (Section C-4a(6))					
Shipment						
72	Are procedures in place to ensure that the generator/storage site accurately completes an EPA Hazardous Waste Manifest prior to shipping the waste to WIPP that contains the following information: <ul style="list-style-type: none"> • Generator/storage site name and EPA ID • Generator/storage site contact name and phone number • Quantity of waste • List of up to six state and/or federal hazardous waste numbers in each line item • Listing of container IDs • Signature of authorized generator representative (Section C-5b)					
73	Are procedures in place to ensure that the generator/storage site accurately completes the following container specific information: <ul style="list-style-type: none"> • Waste stream identification number • List of EPA hazardous waste numbers per container • Certification data • Shipping data (Section C-5b)					

1. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements are meant to ask whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met

**Table C6-2
Acceptable Knowledge (AK) Checklist¹**

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
General Requirements						
134	Are the primary document(s) required in Permit Attachment C4 containing AK information available? (Section C4-2)					
135	Has the generator developed a methodology whereby a logical sequence of AK information that progresses from general facility to more detailed waste-specific information can be acquired? (Section C4-2)					
136	Does the site have adequate procedures in place to ensure that the AK process is adequately implemented? Do these procedures facilitate the mandatory traceability analysis performed for each Summary Waste Category Group examined during the audit? (Section C4-2)					
137	Does the generator site's TRU mixed waste management program information clearly define (or provide a methodology for defining) waste categorization schemes and terminology, provide a breakdown of the types and quantities of TRU mixed waste generated/stored at the site, and describe how waste is tracked and managed at the generator site (including historical and current operations? Do procedures ensure that waste streams are adequately identified? (Section C4-2a)					
138	Does site documentation procedures indicate that the site will document, justify, and consistently define waste streams and assign EPA hazardous waste numbers? (Section C4-2b)					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Required and Additional Information						
140	<p>Does the generator site document that the following must be included in the AK record:</p> <ul style="list-style-type: none"> • Map of the site with the areas and facilities involved in TRU waste generation, treatment, and storage identified • Facility mission description as related to TRU waste generation and management (e.g., nuclear weapons research may involve metallurgy, radiochemistry, and nuclear physics operations that result in specific waste streams) • Description of the operations that generate TRU waste at the site (e.g., plutonium recovery, weapons design, or weapons fabrication) • Waste identification or categorization schemes used at the facility (e.g., item description codes, content codes) • Types and quantities of TRU mixed waste generated, including historical generation through future projections • Correlation of waste streams generated from the same building and process, as appropriate (e.g., sludge, combustibles, metals, and glass) • Waste certification procedures for retrievably stored and newly generated wastes to be sent to the WIPP facility <p>(Section C4-2a)</p>					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
141	<p>Does the generator site document that the following shall be collected for each waste stream:</p> <ul style="list-style-type: none"> A. Area(s) and/or building(s) from which the waste stream was or is generated B. Waste stream volume and time period of generation (e.g., 100 standard waste boxes of retrievable stored waste generated from June 1977 through December 1977) C. Waste generating process described for each building (e.g., batch waste stream generated during decommissioning operations of glove boxes), including processes associated with U134 waste generation, if applicable. D. Documentation demonstrating how the site has historically managed the waste, including the historical regulatory status of the waste (i.e., TRU mixed versus TRU non-mixed waste) E. Process flow diagrams (e.g., a diagram illustrating glove boxes from a specific building to a size reduction facility to a container storage area). In the case of research/development, analytical laboratory waste, or the similar processes where process flow diagrams cannot be created, a description of the waste generating processes, rather than a formal process flow diagram, may be included if this modification is justified and the justification is placed in the auditable record F. Material inputs or other information that identifies the chemical content of the waste stream and the physical waste form (e.g., glove box materials and chemical handled during glove box operations, events or processes that may have modified the chemical or physical properties of the waste stream after generation, data obtained through VE of newly generated waste that later undergoes radiography; information demonstrating neutralization of U134 [hydrofluoric acid] and waste compatibility) <p>(Section C4-2b)</p>					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
142	Do site documents/procedures require that the facility will provide a summary to the Permittees that summarizes information collected, including basis and rationale for waste stream designations? Is an example of this summary available for audit review? If discrepant hazardous waste data exist in required information, do sites consider applying hazardous waste numbers, but assess and evaluate the information to determine the appropriate EPA hazardous waste numbers consistent with RCRA requirements? (Section C4-2b)					
143	Do site procedures indicate that if the required AK information is not available for a particular waste stream, that the waste stream will not be eligible for an AK Sufficiency Determination? (Section C4-2)					
144	Have the following procedures been prepared? A. Procedures for identifying and assigning the physical waste form of the waste B. Procedures for delineating waste streams and assigning Waste Matrix Codes C. Procedures for resolving inconsistencies in AK documentation D. Procedures for VE and/or radiography, if applicable E. For newly generated waste, procedures describing process controls used to ensure prohibited items (specified in the WAP, Permit Attachment C) are documented and managed F. Procedures to ensure radiography and VE include a list of prohibited items that the operator shall verify are not present in each container (e.g. liquid exceeding TSDF-WAC limits, corrosives, ignitables, reactives, and incompatible wastes) G. Procedures to document how changes to Waste Matrix Codes, waste stream assignment, and associated EPA hazardous waste numbers based on material composition are documented for any waste H. Procedures that ensure the assignment of EPA hazardous waste numbers is appropriate, consistent with RCRA requirements, and adequately considers site historical waste management I. Procedures for estimating waste material parameter weights (Section C4-2b)					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
145	Does the generator provide procedures or written commitment to collect additional AK information, as available and as necessary to augment mandatory information? (Section C4-2c)					
146	Does the generator site document that additional specific, relevant information used in the AK process will be identified and its use explained? Is the necessary additional information assembled and has it been appropriately used? (Section C4-2c)					
147	Does the generator site discrepancy analysis documentation (for AK additional and required documentation) indicate that if discrepancies are detected, the site may consider applying EPA hazardous waste numbers indicated in the required and additional information, but must assess and evaluate the information to determine the appropriate EPA hazardous waste numbers consistent with RCRA requirements? (Section C4-2c)					
Training						
148	Does the generator site have procedures to ensure that the personnel involved with AK waste characterization have the following training, and is this training documented? A. WIPP WAP in Permit Attachment C and the TSDf-WAC specified in this permit B. State and Federal RCRA regulations associated with solid and hazardous waste characterization C. Discrepancy resolution and reporting D. Site-specific procedures associated with waste characterization using AK (Section C4-3a)					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Procedures						
149	<p>Has the generator site developed the following procedures, and are these procedures technically sufficient?</p> <p>A. Sites must prepare and implement a written procedure outlining the specific methodology used to assemble AK records, including the origin of the documentation, how it will be used, and any limitations associated with the information (e.g., identify the purpose and scope of a study that included limited sampling and analysis data).</p> <p>B. Sites must develop and implement a written procedure to compile the required AK record.</p> <p>C. Sites must develop and implement a written procedure that ensures unacceptable wastes (e.g., reactive, ignitable, corrosive) are identified and segregated from TRU mixed waste populations sent to the WIPP facility.</p> <p>D. Sites must prepare and implement a written procedure to evaluate AK and resolve discrepancies. For example, if different sources of information indicate different hazardous wastes are present, then sites must include sources of information in its records and may choose to either conservatively assign EPA hazardous waste numbers or assign only those numbers deemed appropriate and consistent with RCRA requirements. Information used to justify assignment of EPA hazardous waste numbers must be placed in the auditable record. Further, the assignment of EPA hazardous waste numbers shall be tracked in the auditable record to required documentation.</p>					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
149a	<p>E. Sites must prepare and implement a written procedure to identify hazardous wastes and assign the appropriate hazardous waste numbers to each waste stream. The following are minimum baseline requirements/standards that site-specific procedures must include to ensure comparable and consistent characterization of hazardous waste:</p> <ol style="list-style-type: none"> 1. Compile the required information in an auditable record. 2. Review the compiled information and delineate waste streams. Delineation of waste streams must comply with the definition in Permit Attachment C, Section C-0a, and justify combining waste historically managed separately as TRU mixed and TRU non-mixed waste streams into a single waste stream. 3. Review the compiled information to determine if the waste stream is compliant with the TSDF-WAC 4. Review the required information to determine if the waste is listed under 20.4.1.200 NMAC (incorporating 40 CFR § 261), Subpart D. Assign the listed EPA hazardous waste numbers, unless the site chooses to justify an alternative assignment and document the justification in the auditable record. 5. Review the required information to determine if the waste exhibits a hazardous characteristic or may contain hazardous constituents included in the toxicity characteristics specified in 20.4.1.200 NMAC (incorporating 40 CFR § 261, Subpart C. If a toxicity characteristic contaminant is identified and is not included as a listed waste, sites may evaluate available data and assign the toxicity characteristic EPA hazardous waste number consistent with RCRA requirements. Data examined to reach the hazardous waste number determination must be placed in the auditable record and must present a clear justification for the EPA hazardous waste number analyses. 6. Review the compiled information to provide an estimate of the material parameter weights for each container to be stored or disposed of at the WIPP facility. For newly generated waste, procedures shall be developed and implemented to characterize hazardous waste using AK prior to packaging. 					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
149b	<p>F. Sites shall ensure that results of audits of the site's TRU mixed waste characterization programs are available in the records.</p> <p>G. Sites shall identify process controls (implemented to ensure that the waste contains no prohibited items and to control hazardous waste content and/or physical form) that have been applied to retrievably stored waste and/or may presently be applied to newly generated waste. Process controls are applied <u>at the time</u> of waste generation/packaging to control waste content, whereas any activities performed <u>after</u> waste generation/packaging to identify prohibited items, hazardous waste content, or physical form are waste characterization activities, not process controls. The AK record must contain specific process control and supporting documentation identifying when these process controls are used to control waste content. See Permit Attachment C, Section C-2 for programmatic requirements related to process controls.</p> <p>(Section C4-3b)</p>					
150	<p>Does the site have implemented procedures which comply with the following criteria to establish AK records:</p> <p>A. Acceptable knowledge information shall be compiled in an auditable record, including a road map for the applicable information.</p> <p>B. The overview of the facility and TRU mixed waste management operations in the context of the facility's mission shall be correlated to specific waste stream information.</p> <p>C. Correlations between waste streams, with regard to time of generation, waste generating processes, and site-specific facilities shall be clearly described. For newly generated wastes, the rate and quantity of waste to be generated shall be defined.</p> <p>D. A reference list shall be provided that identifies documents, databases, Quality Assurance protocols, and other sources of information that support the AK information.</p> <p>E. Container inventories for TRU mixed waste in retrievable storage shall be delineated into waste streams by correlating the container identification to the required and additional AK information.</p> <p>(Section C4-3c)</p>					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
151	If the generator site submitted an AK Sufficiency Determination Request for a specific waste stream, did the site provide the requisite information for which approval is sought? (Section C-0b)					
Re-evaluating Acceptable Knowledge						
152	Does the generator site have written procedures for the augmentation of the AK information using testing? Testing consists of radiography and VE. Do site procedures indicate that the following testing will be conducted based upon the results of the Determination Request AKSD denied – 100 percent RTR or VE (Sections C4-1, C-0b)					
155	Does the generator site have procedures for reevaluating AK if the results of the waste confirmation indicate that the waste to be shipped does not match the approved waste stream or if the data from radiography or VE for waste streams without an AK Sufficiency Determination exhibit this discrepancy? Does this procedure describe how the waste is reassigned, AK reevaluation, and appropriate EPA hazardous waste numbers are assigned? (Section C4-3e)					
156	Do site procedures indicate that debris wastes are assigned toxicity characteristic EPA hazardous waste numbers based on AK regardless of the quantity or concentration? (Section C4-3e)					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Criteria for Assembling an Acceptable Knowledge Record Delineating the Waste Stream						
158	<p>If wastes are reassigned to a different waste matrix code based on site VE or radiography or Permittee confirmation activities, does the generator site have written documentation to ensure that the following steps are followed:</p> <ul style="list-style-type: none"> F. Review existing information based on the container identification number and document differences in EPA hazardous waste number assignments G. If differences exist in the EPA hazardous waste numbers that were assigned, reassess and document required AK information (Section C4-3b) associated with the new designation H. Reassess and document testing data associated with the waste I. Verify and document that the reassigned waste matrix code was generated within the specified time period, area and buildings, waste generating process, and that the process material inputs are consistent with the waste material parameters identified during radiography or VE J. Record any changes to AK records K. If discrepancies exist in the AK information for the revised waste matrix code, document the segregation of the affected portion of the waste stream, and define the actions necessary to fully characterize the waste <p>(Section C4-3e)</p>					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Data Quality Requirements						
168	<p>Are AK processes consistently applied among generator sites, and does each generator site comply with the following data quality requirements for AK documentation:</p> <ul style="list-style-type: none"> A. Precision - The qualitative determinations, such as compiling and assessing AK documentation, do not lend themselves to statistical evaluations of precision. However, the AK information will be addressed by the independent review of AK information during internal and external audits. B. Accuracy - The percentage of waste containers which require reassignment to a new waste matrix code and/or designation of different hazardous waste numbers based on testing data and discrepancies identified by the Permittees during waste confirmation will be reported as a measure of AK accuracy. C. Completeness - The AK record must contain 100 percent of the information (Permit Attachment C4, Section C4-3). The usability of the AK information will be assessed for completeness during audits. 					
168a	<ul style="list-style-type: none"> D. Comparability - Comparability is ensured through sites meeting the training requirements and complying with the minimum standards outlined for procedures that are used to implement the AK process. Sites must assign hazardous waste numbers in accordance with Permit Attachment C4, Section C4-4 and provide this information regarding its waste to other sites who store or generate a similar waste stream. E. Representativeness - Representativeness is a qualitative parameter that will be satisfied by ensuring that the process of obtaining, evaluating, and documenting AK information is performed in accordance with the minimum standards established in Permit Attachment C4. Sites also must assess and document the limitations of the AK information used to assign hazardous waste numbers (e.g., purpose and scope of information, date of publication, type and extent to which waste parameters are addressed). <p>(Section C3-3)</p>					

	WAP Requirement ²	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
169	Does the generator site address quality control by tracking its performance with regard to the use of AK by: 1) assessing the frequency of inconsistencies among information, and 2) documenting the results of waste discrepancies identified by the generator/storage site during waste characterization or the Permittees during waste confirmation using radiography, review of radiography audio/video recordings, VE, or review of VE records. In addition, the AK process and waste stream documentation must be evaluated through internal assessments by generator/storage site quality assurance organizations. (Section C4-3e)					

1. The NMED expects a traceability analysis to be performed, the results of which should be presented on this checklist under the “Examples of Implementation” column. Further, the traceability analysis process and results should be discussed in the Final Audit Report.
2. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements are meant to determine whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.

**Table C6-3
Radiography Checklist**

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Quality Assurance Objectives						
233	<p>Are process procedures in place to meet the following Quality Assurance Objectives?</p> <p><u>Precision</u></p> <ul style="list-style-type: none"> Does the site describe in its QAPjP and SOP(s) activities to reconcile any discrepancies between two radiography operators with regard to identification of the waste matrix code, liquids in excess of TSDf-WAC limits, and compressed gases through independent replicate scans and independent observations? In addition, does the site describe in its QAPjP and SOP(s) activities to verify the precision of radiography prior to use by tuning precisely enough to demonstrate compliance with QAOs through viewing an image test pattern? <p><u>Accuracy</u></p> <ul style="list-style-type: none"> Was accuracy obtained by using a target to tune the image for maximum sharpness and by requiring operators to successfully identify 100 percent of the required items in a training container during their initial qualification and subsequent requalification? 					
233a	<p><u>Completeness</u></p> <ul style="list-style-type: none"> Was an audio/videotape (or equivalent media) of the radiography examination and a radiography data form validated according to the requirements in Permit Attachment C3, Section C3-4? Was an audio/videotape (or equivalent media) of the radiography examination and a radiography data form obtained for 100 percent of the waste containers subject to radiography? <p><u>Comparability</u></p> <ul style="list-style-type: none"> Is comparability ensured through the use of standardized radiography procedures and operator training and qualifications <p>(Section C3-2a)</p>					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Characterization and System Requirements						
234	Does the site have procedures to ensure that radiography is used to identify and verify waste container contents and verify the waste's physical form? Does the site have procedures to identify prohibited materials? (Sections C-3b; C1-1)					
235	Do procedures or other supporting documentation ensure that <u>every</u> waste container will undergo radiography and/or VE as necessary to augment AK? (Section C-3b)					
236	Do procedures ensure that containers whose contents prevent full examination are examined by VE rather than by radiography unless the site certifies that VE would provide no additional relevant information for that container based on the AK information for the waste stream? (Section C1-1)					
237	Do procedures or other supporting documentation ensure that the physical form determined by radiography is compared with the waste stream descriptions? If discrepancies are noted, will a new waste stream be identified? (Section C-3b)					
238	Are there procedures to ensure the data is obtained from an audio/video recorded scan provided by trained radiography operators? (Section C1-1)					
239	Were activities required to achieve the radiography objective described in site Quality Assurance Project Plans (QAPjPs) and Standard Operating Procedures (SOPs)? (Section C3-2)					
240	Did the radiography system consist of the following equipment or equivalent: <ul style="list-style-type: none"> • an X-ray producing device? • an imaging system? • an enclosure for radiation protection? • a waste container handling system? • an audio/video recording system or equivalent? • an operator control and data acquisition station? (Section C1-1)					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
241	Did the X-ray producing device have controls which allow the operator to vary voltage, thereby controlling image quality? Was it possible to vary the voltage, typically between 150-400 kV, to provide an optimum degree of penetration through the waste? Was high-density material examined with the X-ray device set on the maximum voltage? Was low-density material examined at lower voltage settings to improve contrast and image definition? (Section C1-1)					
242	Do procedures or other documentation ensure that an audio/videotape or equivalent is made of the waste container scan and maintained as a non-permanent record? (Section C1-1)					
Data Compilation						
243	Are there procedures to ensure that a radiography data form is used to document the waste matrix code, ensure the waste container contains no ignitable, corrosive or reactive waste by documenting the absence of liquids in excess of TSDF-WAC limits or compressed gases, and verify that the physical form of the waste is consistent with the waste stream description documented on the WSPF? (Section C1-1)					
245	If radiography indicates that the waste does not match the waste stream description, do procedures ensure that the appropriate corrective action was taken? (Section C-3b)					
246	If a discrepancy is noted, do procedures ensure that the proper waste stream assignment is determined, the correct EPA hazardous waste numbers assigned, and the resolution documented? (Section C-3b)					
Training						
247	Do site procedures ensure that only trained personnel are allowed to operate radiography equipment? (Section C1-1)					
248	Do site procedures ensure that training requirements for radiography operators is based upon existing industry standard training requirements? (Section C1-1)					
249	Does the documented training program provide radiography operators with both formal and on-the-job training (OJT)? (Section C1-1)					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
250	Does the documented training program ensure that the radiography operators are instructed in the specific waste generating practices and typical packaging configurations expected to be found in each waste stream at the site? (Section C1-1)					
251	Does the documented training program ensure that the OJT and apprenticeship are conducted by an experienced, qualified radiography operator prior to qualification of the candidate? (Section C1-1)					
252	Is the documented training program site specific? (Section C1-1)					
262	Does the documented training program ensure that a training drum with various container sizes is scanned by each operator on a semiannual basis? Is the videotape reviewed by a supervisor to ensure that operators' interpretations are consistent and accurate? (Section C1-1)					
263	Do site procedures ensure that the site prepares Testing Batch Data Reports or equivalent which includes data pertaining to radiography for up to 20 waste containers without regard to waste matrix? (Section C3-4)					
Quality Assurance						
265	Does the documented training program ensure that the imaging system characteristics are verified on a routine basis? (Section C1-1)					
266	Do procedures ensure that independent replicate scans and replicate observations of the video output of the radiography process are performed under uniform conditions and procedures? Are independent replicate scans performed on one waste container per day or per testing batch of 20 samples, whichever is less frequent, by a qualified radiography operator that was not involved in the original scan of the waste container? Are independent observations of one scan (not the replicate scan) performed once per day or per testing batch, whichever is less frequent, by a qualified radiography operator that was not involved in the original scan of the waste container? (Section C1-1)					
267	Do procedures ensure that oversight functions include periodic audio/video media reviews of accepted waste containers, are performed by qualified radiography operators that were not involved in the original scans of the waste containers? (Section C1-1)					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
268	Is the SPM responsible for monitoring the quality of the radiography data and calling for corrective action, when necessary? (Section C1-1)					
Data Validation, Review, Verification and Reporting						
277	Do procedures ensure that applicable data generation review verification and validation activities specified in Permit Attachment C3, Section C3-4 are followed, including signatory releases? (Section C3-4)					
278	Do procedures ensure that radiography tapes have been reviewed at a frequency of one waste container per day or once per testing batch, whichever is less frequent, to ensure data are correct and completed? (Section C1-1)					
279	Do procedures ensure that applicable project-level signatory releases and DQOs (Section C3-3) as specified in the WAP are performed? (Section C3-4b)					
282	At the data generation level, do procedures ensure that electronic and video data stored appropriately to ensure that waste container, sample, and associated QA data are readily retrievable? Are radiography tapes reviewed, at a frequency of one waste container per day or once per testing batch, whichever is less frequent, against the data reported on the radiography form? (Sections C3-4a, C3-4a(1))					
283	At the project level, do procedures require the SPM to certify that the radiography data are complete and acceptable based on the videotape review of at least one waste container per testing batch or daily, whichever is less frequent? (Section C3-4b(1))					

1. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements are meant to determine whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.

**Table C6-4
Visual Examination (VE) Checklist**

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Training						
296	Is there documentation which shows that a standardized training program for VE operators has been developed? Is it specific to the site and include the various waste configurations generated/stored at the site? (Section C1-2)					
297	Is there documentation which shows that the VE operators receive training on the specific waste generating processes, typical packaging configurations, and waste material parameters expected to be found in each Waste Matrix Code at the site? (Section C1-2)					
298	Are the VE personnel requalified once every two years? (Section C1-2)					
298a	Does the training include the following regardless of Summary Category Group? <ul style="list-style-type: none"> • Identifying and describing the contents of a waste container by examining items in waste containers of previously packaged waste. • Identifying when VE cannot be used to meet the DQOs, (Section C1-2)					
Visual Examination Expert Requirements						
300	Does documentation ensure that the site has designated a VE expert? Is the VE expert familiar with the waste generating processes that have taken place at the site? Is the VE expert familiar with the types of waste being characterized at that site? (Section C1-2)					
301	Does documentation ensure that the VE expert shall be responsible for the overall direction and implementation of the VE aspects of the program? Does the site's QAPjP specify the selection, qualification, and training requirements of the VE expert? (Section C1-2)					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Visual Examination Procedures						
304	Do procedures indicate that VE activities are documented on video/audio media or VE performed by using a second operator to provide additional verification by reviewing the contents of the waste container to ensure correct reporting? (Section C1-2)					
304a	Are procedures in place to ensure that when VE is performed using a second operator, each operator performing VE shall observe for themselves the waste being placed in the container or the contents within the examined waste container when waste is not removed? (Section C1-2)					
313	Do site procedures ensure that when liquid is found, the non-transparent internal container holding the liquid will be assumed to be filled with liquid and this volume will be added to the total liquid in the container being characterized using VE? The container being characterized using VE would then be rejected and/or repackaged to exclude the internal container if it is over the TSDF-WAC limits. (Section C-3b)					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Quality Assurance Objectives						
314	<p>Are process procedures in place to meet the following Quality Assurance Objectives?</p> <p><u>Precision</u></p> <ul style="list-style-type: none"> Precision is maintained by reconciling any discrepancies between the operator and the independent technical reviewer with regard to identification of waste matrix code, liquids in excess of TSDF-WAC limits, and compressed gases. <p><u>Accuracy</u></p> <ul style="list-style-type: none"> Accuracy is maintained by requiring operators to pass a comprehensive examination and demonstrate satisfactory performance in the presence of the VE expert during their initial qualification. Visual examination operators shall be requalified every two years. <p><u>Completeness</u></p> <ul style="list-style-type: none"> A validated VE data form will be obtained for 100 percent of the waste containers subject to VE. <p><u>Comparability</u></p> <ul style="list-style-type: none"> The comparability of VE data from different operators shall be enhanced by using standardized VE procedures and operator qualifications. <p>(Section C3-2b)</p>					

1. The WAP requirements should be presented in documents, such as procedures. Each of the questions posed under WAP requirements are meant to determine whether procedures are in place or whether documents are evident which demonstrate that the specific WAP requirement is or can be met.