

# CCP-TP-093

Revision 15

## CCP Sampling of TRU Waste Containers

EFFECTIVE DATE: 03/10/2011

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PRINTED NAME

APPROVED FOR USE

## RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	10/02/2003	Initial Issue
1	12/05/2003	Management Assessment Recommendations: Revised steps and sequencing of sub-steps in Sections 4.1-4.6. Added MAC-21 HEPA system to steps 4.4.4[B] and 4.4.5[B]. Updated Attachments 1 and 2.
2	03/19/2004	Incorporated CBFO Comment resolutions and revised Sections 2.0, 4.0 and Attachments 1 and 2 resulting from the LANL MSA, LRA and Dry-runs in December 2003 - February 2004.
3	02/26/2005	Incorporated Certification Audit Recommendations and process improvements for CAR-CCP-LANL-0002-04. Incorporated changes to allow for sampling with various types of filters.
4	03/11/2005	Revised in response to the DOE Line Management Assessment.
5	03/22/2005	Inserted new steps for multiple filters.
6	04/15/2005	Revised Table 4 to update Configuration Group 5 and 6.
7	06/29/2005	Revised in response to Certification Audit Recommendations.
8	12/22/2005	Revised to coincide with QA surveillance and to respond to CAR-INL-0009-05 requirements.
9	07/26/2006	Revised in response to CAR LANL-0006-06 and editorial changes.
10	09/11/2006	Revised step 4.3.1[A.14][b].
11	11/16/2006	Revised to implement the Waste Isolation Pilot Plant Hazardous Waste Facility Permit requirements resulting from the Section 311/Remote-Handled (RH) Permit Modification Request (PMR). Addressed Carlsbad Field Office (CBFO) Document Review Record (DRR) comments.
12	02/12/2007	Revised to incorporate sampling at risk.
13	03/19/2007	Revised step 4.3.2, to identify temperature as 18° C or higher.

RECORD OF REVISION (Continued)

Revision Number	Date Approved	Description of Revision
14	12/29/2010	Revised to eliminate the allowance of the procedure to perform Transportation Headspace sampling. Revised the note under step 4.5.6 per CCP-PO-001, <i>CCP Transuranic Waste Characterization Quality Assurance Project Plan</i> . Made editorial changes. Clarified the Field Reference Standard process. Eliminated the allowance of compositing samples. Updated the Chain-of-Custody form. Changed the batch data report (BDR) numbering format. Incorporated recommendations from Audit A-10-04. Updated references to the <i>Waste Isolation Pilot Plant Hazardous Waste Facility Permit</i> .
15	03/10/2011	Revised to update the procedure so the field blank criteria matches the permit, eliminated the Vendor Project Manager (VPM) from the responsibilities section, and clarified the use of Chain-of-Custody.

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## 1.0 PURPOSE

The Central Characterization Project (CCP) will perform manual sampling of headspace gas (HSG) in transuranic (TRU) waste containers. HSG sampling operations are required to ensure compliance with CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*.

This procedure provides CCP-specific requirements and interface instructions for Manual Container Gas Sampling, Needle Assembly, and Sample Shipping/Transport Preparations.

### 1.1 Scope

This procedure identifies the steps to perform manual HSG sampling of TRU waste containers using a side port needle assembly. This procedure applies to Summary Category Group S5000 waste as indicated in Table 1, Headspace Gas Drum Age Criteria Sampling Scenario, Table 2, Scenario 1 Drum Age Criteria (in days) Matrix, Table 3, Scenario 2 Drum Age Criteria (in days) Matrix, Table 4, Scenario 3 Packaging Configuration Groups, and Table 5, Scenario 3 Drum Age Criteria (in days) Matrix for S5000 Waste by Packaging Configuration Group. This sampling procedure is conducted at a facility specified by the Host site. After sampling, the canisters are sealed and prepared for shipment/transport to an approved laboratory for analysis.

## 2.0 REQUIREMENTS

### 2.1 References

#### Baseline Documents

- CCP-PO-002, *CCP Transuranic Waste Certification Plan*

#### Referenced Documents

- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*
- CCP-QP-008, *CCP Records Management*
- CCP-QP-022, *CCP Software Quality Assurance Plan*
- CCP-TP-106, *CCP Headspace Gas Sampling Batch Data Report Preparation*

### 2.2 Training Requirements

- 2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan*, prior to performing this procedure.

### 2.3 Equipment List

#### 2.3.1 Materials

- [A] 250 milliliter(s) (mL) or greater SUMMA<sup>®</sup> or equivalent canisters cleaned and certified.
- [B] Needle assemblies containing:
- 3 inches (in.) x 1/16 in. Side Port Needle
  - Swagelok 1/4 in. x 1/16 in. Reducing Union
  - Swagelok 1/4 in. Tube Adapter Gland
  - Cajon 1/4 in. Vacuum Coupling Radlab (VCR) Nut

- Cajon VCR Filter Gasket (0.5 micron)
- 1/16 in. Swagelok Union Tee (Duplicate assembly)
- 1/16 in. Teflon Tubing (Duplicate assembly)
- Plastic Protective Cap

[C] Ambient Pressure Meter (Calibrated and listed in the Measuring and Test Equipment [M&TE] database).

[D] Ambient Temperature Thermometer (Calibrated and listed in the M&TE database).

[E] Temperature Recorder (e.g., datalogger, mechanical temperature recorder, Min/Max thermometer), (calibrated and listed in the M&TE database).

[F] Latex or equivalent gloves.

[G] Tamper Indicating Devices (TID).

[H] A gaseous Field Reference Standard (FRS) containing at least six of the target compounds listed in CCP-PO-001.

[I] Ultra High Purity (UHP) Nitrogen.

[J] Tools:

- 5/16 in. Wrench
- 1/2 in. Wrench
- 9/16 in. Wrench
- 1-1/8 in. Wrench
- 5/8 in. Wrench
- 3/4 in. Wrench
- 5/64 in. Allen Wrench
- Vise (recommended)
- Filter Cover Blank
- Latex Cover Material and Rubber O-Ring

- [K] Canned or Compressed Gas.
- [L] High Efficiency Particulate Air (HEPA) System, if applicable.
- [M] Valve Locking Device.
- [N] 2 in. Vinyl Tape.
- [O] Sample Port Assembly:
  - [O.1] Septa
  - [O.2] Septum Seal Cap
  - [O.3] Flat Metal Plate
  - [O.4] Clamps
- [P] Penetrating Tool

#### 2.3.2 Software

- [A] The software listed below complies with the requirements of CCP-QP-022, *CCP Software Quality Assurance Plan*.
  - [A.1] Dickson<sup>®</sup> Data Logger Software.

### 2.4 Precautions and Limitations

#### 2.4.1 Safety Precautions

- [A] All container sampling activities using this procedure shall be performed in accordance with site-specific health, safety, and Approved Method of Work (AMOW) requirements. Applicable documents include CCP procedures, Host site procedures, and safety requirements for access control, radioactive and hazardous waste monitoring, personal protective equipment (PPE), operations, containment, and decontamination.

#### 2.4.2 Hazards

- [A] Hazards associated with the sampling process may include chemical and radiation exposure.

#### 2.4.3 SUMMA<sup>®</sup> or equivalent Canister Gauge Pressure Reading Limitations

- [A] SUMMA<sup>®</sup> or equivalent canisters are equipped with pressure gauges reading pressure or vacuum relative to atmospheric pressure (i.e., initial gauge reading of greater than or equal to 22 in. Mercury [Hg]); full samples are less than or equal to four inches Hg.

## 2.5 Prerequisite Actions

### 2.5.1 Perform the following prior to any sampling activities:

- [A] Check to see if any TRU waste containers readied for sampling have CCP Hold Tags.
- [B] **IF** any TRU waste containers have a CCP Hold Tag, **THEN** verify with Vendor Project Manager (VPM), if it is appropriate to collect a sample for HSG from a TRU waste container with a CCP Hold Tag.

### 2.5.2 Ensure the following documentation has been obtained for each canister before proceeding with the sampling activity:

- [A] The designated analytical laboratory's canister tag.

### 2.5.3 Receive and stage waste containers in accordance with applicable Host site procedures.

### 2.5.4 Prepare the designated sampling area in accordance with applicable Host site procedures.

### 2.5.5 Ensure the temperature has been maintained greater than or equal to 18 degree Celsius (°C) for 72 hours in the staging area prior to waste container HSG sampling by reviewing the temperature dataloggers output.

## 2.6 Definitions

### 2.6.1 **Field Blank (FB)** – Field blanks (FB) shall be samples of room air collected in the immediate vicinity of the waste container sampling area. Field blanks shall be collected prior to sample collection, and at a frequency of one per sampling batch.

### 2.6.2 **Field Duplicates (FD)** - Two separate, independent samples collected simultaneously from the same source using a duplicate sampling needle assembly (one needle connected to two SUMMA<sup>®</sup> or equivalent canisters); stored in separate containers, and analyzed independently; duplicates are used to document the precision of the sampling and

analysis process field duplicates (FD) are collected one per sampling batch.

- 2.6.3 **Field Reference Standard (FRS)** – Field Reference Standard (FRS) shall be used to assess the accuracy with which the sampling equipment collects Volatile Organic Compound (VOC) samples into SUMMA<sup>®</sup> or equivalent canisters prior to first use of the sampling equipment. The FRS contains a minimum of six of the analytes listed in CCP-PO-001, at concentrations within a range of 10 to 100 parts per million by volume (ppmv) and greater than the Method Detection Limit (MDL) of each compound. For the direct canister method, FRS collection may be discontinued if the FRS results demonstrate the quality assurance objective (QAO) for accuracy specified in CCP-PO-001. FRSs have a known valid relationship to a nationally recognized standard (e.g., National Institute of Science and Technology [NIST]), if available. If NIST-traceable standards are not available and commercial gases are used, a Certificate of Analysis from the manufacturer documenting traceability is required.
- 2.6.4 **Sampling Batch** - A suite of samples of similar matrix (i.e., gas or solid) collected consecutively using the same sampling equipment within a specified time period. A batch can be up to 20 samples (excluding Quality Control [QC] samples), all of which shall be collected within 14 days of the first sample in the batch.
- 2.6.5 **Single Sample** - Containers that must be analyzed individually.

3.0 RESPONSIBILITIES

3.1 HSG Sampler

3.1.1 Receives sample canisters, collects, and prepares for shipment/transport of HSG samples.

3.1.2 Verifies compliance, when applicable, by signing, initialing, and dating the acceptance of the sampling canisters and the Chain-of-Custody (COC) documentation.

3.1.3 Prepares the waste containers for HSG sampling.

3.1.4 Performs activities including removing container filter protective caps, installing new filters or the installation of sample ports.

3.1.5 Verifies approved filter before sampling.

3.1.6 Verifies waste containers have been properly prepared.

3.1.7 Assigns batch numbers to required batches.

## 4.0 PROCEDURE

**NOTE**

Sections of this procedure may be performed independently.

<b>Independent Task</b>	<b>Section to Perform</b>
Process Prior to Sampling	Section 4.1 through Section 4.3
Assembling Single Needle Assemblies	Step 4.4.1
Assembling Duplicate Needle Assemblies	Step 4.4.2
Prepare SUMMA <sup>®</sup> or equivalent Canisters For Collecting Needle Assembly Certification Blanks	Step 4.4.3
Prepare COC and Sample Tags For Needle Assembly Certification Blanks	Step 4.4.4
Collect Needle Assembly Certification Blanks Using Nitrogen Gas	Step 4.4.5
Initiate Waste Container COC/Sample Tags	Step 4.5.1
Prepare SUMMA <sup>®</sup> or equivalent Canisters With Certified Needle Assemblies For Sample Collection	Step 4.5.2
FB Sample Collection	Step 4.5.3
Waste Container and Waste Container Duplicate HSG Sample Collection	Step 4.5.4
Collection of Waste Container HSG Sample	Step 4.5.5
Collection of FRS	Step 4.5.6
Pre-Transport/Shipping Activities of Canister Samples to Laboratory	Section 4.6
Final disposition of SUMMA <sup>®</sup> or equivalent Canister to Laboratory	Section 4.7

**HSG Container Samplers**

## 4.1 Process Prior to Sampling

## 4.1.1 Perform the following before sampling:

[A] Verify the presence of an approved filter.

## 4.2 Waste Container Preparation

4.2.1 Verify the waste containers have been properly prepared for sampling (i.e., rigid liner vented, if present, no rigid sealed internal containers > 4 liters) by reviewing one of the following documents: Real-Time Radiography (RTR), visual examination (VE) Data Sheets, or Standard Waste Box (SWB) Assembly Sheet.

[A] **IF** the waste containers have been properly prepared,  
**THEN GO TO** Section 4.3.

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### NOTE

Performing sampling at risk can only be authorized by the CCP Program Manager.

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[B] **IF** the containers are to be sampled at risk,  
**THEN** generate a Nonconformance Report (NCR) per CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*, recording the following information in the applicable fields of the NCR:

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### NOTE

If the NCR contains multiple Batch Data Reports (BDRs), there must be a clear correlation as to which container goes with which BDR.

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- BDRs applicable to this NCR (Box 3)
  - Container(s) applicable to this NCR (Box 3)
  - (Actual Condition) Containers Sampled at Risk (Box 7c)
  - On Interim Disposition (Box 14), check Reinspect/Retest
  - For Instructions for Completion of the Interim Disposition (Box 14a), record HOLD BATCH UNTIL THE LISTED CONTAINERS HAVE BEEN EVALUATED BY THE RTR OR VE
- [C] When Interim Disposition is complete, record the following in final disposition:
- For Final Disposition (Box 19), check Use As Is
  - For Technical Justification (Box 19a), record CONTAINERS EVALUATED IN INTERIM DISPOSITION AND APPROPRIATELY DISPOSITIONED

- [D] **IF** the waste containers have **NOT** been properly prepared, **THEN** apply a CCP Hold Tag, contact the Vendor Project Manager (VPM), **AND** disposition in accordance with the applicable Container Management procedure.

#### 4.3 Container Data

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##### **NOTE**

Drum Age Criteria (DAC) data may be obtained from the approved AK documentation (e.g., AK Tracking Spreadsheet), Container Travelers, RTR **AND/OR** VE Data Sheets. Attachment 2, Sample Container Data Form, can be filled out prior to sampling.

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##### **NOTE**

Waste container Field Batch Number is defined as SSHSGYYXX, where SS is defined as Host site (e.g., IN), HSG is headspace gas, YY is the year, XX is a sequential number. The sequential number, XX, is reset to 01 at the beginning of each year.

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- 4.3.1 For all the containers to be sampled, verify the DAC prior to Sampling by using Tables 1-5, as appropriate **AND** perform the following:

- [A] Record the container information listed below on Attachment 2:
- [A.1] Field Batch Number (on Page 1 and Page 2).
  - [A.2] Container ID (on Page 1 and 2).
  - [A.3] Sampling Scenario.
  - [A.4] Summary Category Group.
  - [A.5] Rigid Liner (Y/N).
  - [A.6] Rigid Liner Lid (Y/N).
  - [A.7] Rigid Liner Lid Hole Diameter (in.).

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**NOTE**

The “bounding case” configuration used in Table 4 is the “conservative default” referred to in footnote “a” of Table 4.

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[A.8] Number of Inner Bags (Scenario 3 only) or NA, for Scenario 1 or 2.

[A.9] Number of Liner Bags (Scenario 3 only) or NA, for Scenario 1 or 2.

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**NOTE**

The documented filter hydrogen (H<sub>2</sub>) diffusivity must be greater than or equal to the listed value to use the DAC for the listed filter H<sub>2</sub> diffusivity (e.g., a container with a filter H<sub>2</sub> diffusivity of  $4.2 \times 10^{-6}$  must use a DAC for a filter with a  $3.7 \times 10^{-6}$  filter H<sub>2</sub> diffusivity). If a filter H<sub>2</sub> diffusivity for a container is undocumented or unknown or is less than  $1.9 \times 10^{-6}$  filter H<sub>2</sub> diffusivity, a filter of known H<sub>2</sub> diffusivity that is greater than or equal to  $1.9 \times 10^{-6}$  filter H<sub>2</sub> diffusivity must be installed prior to initiation of the relevant DAC period. A list of Carlsbad Field Office (CBFO) approved filter vents with a known hydrogen diffusivity maybe viewed at <http://www.wipp.energy.gov/library/wac/FilterVents.pdf>.

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[A.10] Filter Model No.

[A.11] Number of Filters.

[A.12] **IF** the approved filter has a Restrictive Hydrogen Diffusivity listed in the appropriate Table of this procedure,  
**THEN** enter the approved filters diffusivity from the Table,  
**ELSE** enter the more conservative diffusivity used to determine the Permit Required Equilibrium days.

[A.13] Package Configuration Group No. from Table 3 (Scenario 3 only) (NA for Scenario 1 or 2).

[A.14] Closure Date.

[A.15] Vent Date (for Scenario 2 and 3) (NA for Scenario1).

[A.16] Permit Required Equilibrium Time (Days):

- (a) For Scenario 1 - Record the Summary Category Group (SCG) DAC from Table 2.
- (b) For Scenario 2 - In addition to meeting the Scenario 1 SCG DAC from Table 2, record the number of days listed in Table 3 for the SCG, hole diameter and diffusivity rate.
- (c) For Scenario 3 - Record the number of days for the SCG listed in Table 5 for the Packaging Configuration Group, hole diameter, and filter diffusivity.

[A.17] Container Age (Days) (the difference in the number of days between the closure/vent date and the present date [e.g., date sampling for headspace]).

[A.18] Container Fill Factor (%), if applicable.

4.3.2 Ensure the waste containers have equilibrated for a minimum of 72 hours at 18° C (64.4 degree fahrenheit [°F]) or higher, prior to sampling by reviewing the temperature recorder information, **AND** record on Attachment 2 the 72-Hour Container Equilibrium Start and scheduled End Dates/Times.

4.3.3 Record the temperature recorder M&TE ID Number and temperature recorder calibration due date on Attachment 2.

4.3.4 Can this container be sampled? (Y or N).

4.3.5 Print name, sign, and date Attachment 2 after all information has been recorded.

4.3.6 Inspect all tools and parts to be used to ensure they are available and operable.

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#### 4.4 Sampling Preparation

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##### NOTE

Needle Assembly batches will consist of single needle assemblies and/or duplicate assemblies.

Needle assemblies will be kept in a controlled HSG area.

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##### 4.4.1 Single Unit Needle Assembly

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##### NOTE

For illustration of Single Unit Needle Assembly, see Figure 1, Single Canister Sampling Components.

Single Unit Needle Assemblies consist of five components. Needle assemblies are less than 2 mL internal volume.

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- [A] Inspect all components for damage, **AND** if necessary, blowdown each item with compressed gas (e.g., canned air, compressed UHP Nitrogen).
- [B] Place a 1/4 in. VCR female nut onto a 1/4 in. Swagelok tube adapter to VCR gland.
- [C] Install the 1/4 in. Swagelok nut, ferrule backing ring, **AND** ferrule onto the 1/4 in. tube adapter.
- [D] Insert the 1/4 in. Swagelok tube adapter into the 1/4 in. fitting on the 1/4 in. x 1/16 in. Swagelok reducing union.
- [E] Ensure the 1/4 in. tube rests firmly on the shoulder of the fitting.
- [F] Gently tighten the nut, finger tight.
- [G] Hold the fitting body with a backup wrench, **AND** tighten the nut 3/4 to 1-1/2 turns.
- [H] Insert the open end of the needle into the 1/16 in. fitting on the 1/4 in. x 1/16 in. Swagelok reducing union.
- [I] Ensure the needle rests firmly on the shoulder of the fitting.
- [J] Gently tighten the nut, finger tight.

- [K] Hold the fitting body with a backup wrench, **AND** tighten the nut 3/4 to 1-1/2 turns.
- [L] Snap the 1/4 in. VCR filter onto the VCR gland.
- [M] Install the plastic protective cap into the 1/4 in. VCR nut, if applicable.
- [N] Repeat steps 4.4.1[A] through 4.4.1[M] for all needle assemblies required.

#### 4.4.2 Duplicate Unit Needle Assembly

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#### **NOTE**

For illustration of Duplicate Unit Needle Assembly, see Figure 2, Duplicate Canister Sampling Components.

Duplicate Unit Needle Assemblies consist of seven components. Needle assemblies are less than 2 mL internal volume.

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- [A] Inspect all components for damage, **AND** if necessary, blowdown each item with compressed gas (e.g., canned air, compressed UHP Nitrogen).
- [B] Prepare two single unit needle assemblies without needles per steps 4.4.1[A] through 4.4.1[F].
- [C] Snap a 1/4 in. VCR filter onto each of the two VCR glands.
- [D] Install the plastic protective caps into the 1/4 in. VCR nuts, if applicable.
- [E] Install Teflon tubing sections into the two single unit needle assemblies in place of the needles.
- [F] Gently tighten the nuts, finger tight.
- [G] Hold each fitting body with a backup wrench, **AND** tighten the nuts 3/4 to 1-1/2 turns.
- [H] Install a needle in the 1/16 in. Swagelok tee.
- [I] Ensure the needle rests firmly on the shoulder of the fitting.
- [J] Gently tighten the nut, finger tight.

- [K] Hold the fitting body with a backup wrench, **AND** tighten the nut 3/4 to 1-1/2 turns.
- [L] Install the two Teflon tubes from the two needle assemblies into the 1/16 in. tee.
- [M] Ensure the Teflon tubes rest firmly on the shoulder of the fitting.
- [N] Gently tighten the nuts, finger tight.
- [O] Hold the fitting body with a backup wrench, **AND** tighten the nut 3/4 to 1-1/2 turns.
- [P] Repeat steps 4.4.2[A] through 4.4.2[O] for all Duplicate Needle Assemblies required.

#### 4.4.3 SUMMA<sup>®</sup> or equivalent Canister/Needle Assembly Preparation for Cleanliness Certification

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##### NOTE

Needle Assembly Cleanliness Batches are defined similar to waste container field batches. The format is SSHSGYYXXNB, where SS is defined as the Host site (e.g., IN), HSG is headspace gas, YY is the year, XX is a sequential number and NB is needle blank. The sequential number, XX, is reset to 01 at the beginning of each year.

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##### NOTE

When a Needle Assembly batch is complete, a Needle Assembly Cleanliness Batch sample is collected. A minimum of three percent from the Needle Assembly Batch (single and/or duplicate assemblies) are chosen at random and a nitrogen purge test is performed.

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- [A] **IF** the canister has not been evacuated to greater than **OR** equal to 22 inches Hg, **THEN** reject canister and return to analytical laboratory.
- [B] Attach needle assemblies to the required canisters as follows:
  - [B.1] Verify the presence of a Cajon VCR filter gasket.
  - [B.2] **IF** the needle assembly **DOES NOT** have a Cajon VCR filter gasket, **THEN** obtain another new needle assembly.

[B.3] Purge the needle assembly with compressed gas (e.g., canned gas, Nitrogen Gas).

[B.4] Attach the needle assembly to the canister, **AND** finger tighten and then an additional ¼ turn with a wrench.

#### 4.4.4 Prepare COC and Sample Tags for Needle Assembly Certification Blanks

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**NOTE**

Point of Origin is to be specific as to the location where sample was taken (e.g., Bldg. No., Room).

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**NOTE**

Only one COC shall be used per sampling batch.

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[A] Record the following information on Attachment 1, Chain of Custody/Canister Tag.

[A.1] Chain of Custody # (sequential number starting with number 1) (on Page 1 and 2).

[A.2] Location (i.e., NA for Location).

[A.3] Point of Origin (i.e., Bldg. No. - Room).

[A.4] Field Batch Number (record the Needle Assembly Cleanliness Batch Number) (on Page 1 and 2).

[A.5] Ambient Conditions:

(a) Temperature reported to 0.1°C.

(b) Pressure reported to the nearest whole number inches Hg or pound per square inch gauge (psig).

[A.6] Record the following in the Instrument section Attachment 1 (Page 2 of 2):

(a) Pressure Meter M&TE Identification (ID) Number, **AND** Calibration Due Date, Initial, and Date.

(b) Thermometer M&TE ID Number, **AND** Calibration Due Date, Initial, and Date.

4.4.5 Needle Assembly Cleanliness Certification Blank Collection Using Nitrogen Gas

- [A] Perform Leak Check of the needle assembly while connected to the canister by placing a septum over the side port of the needle **AND** opening the canister valve five seconds **AND** ensuring that the needle assembly is free of leaks.
  - [A.1] **IF** the canister pressure gauge reading changes by more than 2 in. Hg, **THEN DO NOT** use the needle assembly.
- [B] Connect the cleanliness sample purge assembly to the nitrogen gas regulator **OR** nitrogen gas cylinder.
- [C] OPEN the valve, **AND** set the cylinder's output regulator pressure from 0 to 1 psig.
- [D] Bleed the purge assembly to assure no room air remains in the purge assembly.
- [E] Insert the canister needle into the cleanliness sample purge assembly.
- [F] Record NA in the VENT SEAL block on Attachment 1.
- [G] Record the canister gauge BEGINNING PRESSURE and START TIME on Attachment 1, **AND** OPEN the valve on the SUMMA<sup>®</sup> or equivalent canister.
- [H] Adjust the regulator to obtain 13 to 15 psig in the SUMMA<sup>®</sup> or equivalent canister.
- [I] CLOSE the valve on the SUMMA<sup>®</sup> or equivalent canister, **AND** record the canister END PRESSURE and END TIME on Attachment 1.
- [J] **IF** the canister gauge DOES **NOT** read 13 to 15 psig, **THEN** obtain a new SUMMA<sup>®</sup> or equivalent canister and new needle assembly from the newly assembled batch, **AND** resample by repeating steps 4.4.5[A] through 4.4.5[I].
- [K] Return canister which did not read 13 to 15 psig to the analytical laboratory.
- [L] Remove the canister needle from the purge assembly.

- [M] Remove the needle assembly from the canister.
- [N] Attach a valve locking device and a TID to the canister.
  - [N.1] Record the TID NUMBER on Attachment 1.
  - [N.2] **IF** the TID is **NOT** numbered,  
**THEN** initial and date TID with a permanent marker, **AND**  
record NA on Attachment 1.
- [O] Record or ensure all data listed below, for the Needle Assembly Cleanliness Sample, is recorded on Attachment 1:
  - [O.1] Site (zz) (Host site abbreviation).
  - [O.2] Date (date of the sample - mmddyy, where mm is the month in two digits, dd is the date in two digits and yy is the last two digits of the year). **DO NOT** use slash marks when recording the date on Attachment 1.
  - [O.3] SUMMA<sup>®</sup> or equivalent Canister No. (from the metal tag on the canister) Example: EI234.
  - [O.4] Canister Size (e.g., 250 mL).
  - [O.5] Container ID/Barcode No. (e.g., Nitrogen Gas Cylinder No. for cleanliness samples).
  - [O.6] Waste Stream ID (record NA for cleanliness samples).
  - [O.7] Cleaning Batch No. (from the laboratory canister tag).
  - [O.8] Needle Assembly Batch No.
  - [O.9] Record C - Needle Assembly Cleanliness Certification.
  - [O.10] Sampler's Initials.
- [P] Record the relevant data to the laboratory canister tag, including any additional information required by the analytical laboratory.
  - [P.1] Record Needle Assembly in the Sample Description on the laboratory canister tag.

- [P.2] **IF** it is necessary to remove the laboratory canister tag to record data,  
**THEN** remove the tag from the canister, record the data,  
**AND** immediately re-attach the tag to the canister.
- [Q] Repeat steps 4.4.5[A] through 4.4.5[O.7] until a minimum of three percent of the needle assemblies have been sampled.
- [R] Sign the CUSTODY INITIATED BY block on Page 2 of Attachment 1, record DATE and TIME.
- [S] CLOSE valve on Nitrogen Gas Cylinder.
- [T] Bleed out all the pressurized nitrogen from the lines and fittings.

---

**NOTE**

If more than one qualified sampler is part of the sampling evolution, only one qualified sampler is required to sign on the SAMPLER'S SIGNATURE line on Attachment 1.

---

- [U] On Attachment 1 sign on the SAMPLER'S SIGNATURE line.

4.5 Waste Container Sampling Activity

---

**NOTE**

Section 4.5 provides the directions for collecting all QC and waste container samples associated with a BDR. All sampling activities conducted for any sampling event, including FB collection, FD collection, waste container sample collection, and FRS (if required); will be contained in the same BDR. If a sampling event is conducted only for the purpose of analyzing a FRS, a FB and FD will be collected and submitted with the associated BDR.

---

---

**NOTE**

Point of origin is to be specific as to the location where sample was taken (e.g., Bldg. No., Room). Location is to be specific as to the location within the waste container where sample is taken (e.g., under lid).

---

---

**NOTE**

Data on Attachment 1 for steps 4.5.1[A.1] through 4.5.1[A.7] may be recorded prior to or during sampling activities.

---

**CAUTION**

To prevent damage to the needle and needle assembly, the sample canister must be supported while performing sampling activities.

4.5.1 Preparing Waste Container COC/Sample Tags

---

**NOTE**

Only one COC shall be used per sampling batch.

---

- [A] Record the following information on Attachment 1.
  - [A.1] Chain of Custody # (sequential number starting with number 1) (on Page 1 and 2).
  - [A.2] Location (i.e., under lid).
  - [A.3] Point of Origin (i.e., Bldg. No., Room).
  - [A.4] Field Batch Number (on Page 1 and 2).

- [A.5] **IF** the pressure meter or the thermometer is out of calibration,  
**THEN** do not use and obtain a pressure meter or thermometer that is within the Calibration Due Date.
- [A.6] Ambient Conditions:
- (a) Temperature reported to 0.1°C.
  - (b) Pressure reported to nearest whole number inches Hg or psig.
- [A.7] Record the following in the Instrument Section of Attachment 1 (Page 2 of 2):
- (a) Pressure Meter M&TE ID Number, Calibration Due Date.
  - (b) Thermometer M&TE ID Number, Calibration Due Date.
  - (c) Initial and date.

#### 4.5.2 Preparing SUMMA<sup>®</sup> or equivalent canister with Certified Needle Assemblies for Sample Collection

- [A] **IF** the canister has not been evacuated to greater than **OR** equal to 22 inches Hg,  
**THEN** reject canister and return to the analytical laboratory.
- [B] Attach needle assemblies to the canisters as follows:
- [B.1] Verify the presence of a Cajon VCR filter gasket.
- (a) **IF** the needle assembly **DOES NOT** have a Cajon VCR filter gasket,  
**THEN** obtain a new needle assembly.
- [B.2] Attach the needle assembly to the canister **AND** finger tighten and then an additional ¼ turn with a wrench.

---

### 4.5.3 Field Blank Sample Collection

---

#### NOTE

Vent Seal, canister gauge, Beginning Pressure, and TID number information may be recorded prior to or during sampling activities on Attachment 1.

---

#### NOTE

HSG samples should take approximately two to five minutes to reach equilibrium. Collect the field blank sample in the vicinity of the waste container sampling area.

---

- [A] All personnel, don PPE in accordance with the appropriate AMOW **OR** equivalent.
- [B] Ensure the HEPA System has been turned on, if applicable.
- [C] Record NA in the Vent Seal block on Attachment 1, if applicable.
- [D] Record the canister gauge Beginning Pressure and Start Time on Attachment 1, **AND OPEN** the valve on the SUMMA<sup>®</sup> or equivalent canister for a maximum of five minutes to allow the canister pressure to reach equilibrium (less than or equal to 4 in. Hg).
- [E] Close the valve on the SUMMA<sup>®</sup> or equivalent canister, **AND** record the canister End Pressure and End Time on Attachment 1.
- [F] **IF** the gauge **DOES NOT** reach less than or equal to 4 in. Hg, **THEN** obtain new SUMMA<sup>®</sup> or equivalent canister and certified needle assembly, **AND** repeat steps 4.5.3[B] through 4.5.3[E].
  - [F.1] **IF** the second attempt **FAILS**, **THEN** troubleshoot and fix.
- [G] Remove the needle assembly from the canister, **AND** hand it to the Radiological Control Technician (RCT) or Radiological Technician (RT) for survey and proper disposal per Host site requirements.
- [H] Attach a valve locking device and a TID to the canister.
- [I] Record the TID number on Attachment 1, if applicable.

- 
- [J] IF the TID is **NOT** numbered,  
**THEN** initial and date the TID with a permanent marker, **AND**  
record NA on Attachment 1.

---

**NOTE**

Custody will be initiated after the Field Blank sample has been collected. The Date/Time on Page 2 of Attachment 1 for Custody Initiated By block will be the same as the Date and End Time for the Field Blank sample.

---

- [K] Initiate COC by recording the date and time in the DATE/TIME block next to the CUSTODY INITIATED BY: block of Attachment 1.

---

**NOTE**

Data on Attachment 1 for steps 4.5.3[L.1] through 4.5.3[L.9] may be recorded prior to or during activities.

---

- [L] Enter the data listed below for the Field Blank, on Attachment 1:
- [L.1] Site (zz) (Host site abbreviation).
  - [L.2] Date (date of the sample - mmddy, where mm is the month in two digits, dd is the date in two digits and yy is the last two digits of the year). **DO NOT** use slash marks when recording the date on Attachment 1.
  - [L.3] SUMMA<sup>®</sup> or equivalent Canister No. (from the metal tag on the canister) Example: EI234.
  - [L.4] Canister Size (e.g., 250 mL).
  - [L.5] Container ID/Barcode No. (NA for Field Blank).
  - [L.6] Waste Stream ID (NA for Field Blank).
  - [L.7] Cleaning Batch No. (from the laboratory canister tag).
  - [L.8] Needle Assembly Batch No.
  - [L.9] Record B - Field Blank.

---

**NOTE**

Signature of samplers can be found at the bottom of Attachment 1.

---

- [L.10] Sampler's Initials.

---

**NOTE**

Relevant data for the laboratory canister tags can be recorded prior to or during sampling activities.

---

- [M] Copy the relevant data to the laboratory canister tag, including any additional information required by the analytical laboratory.
- [M.1] Record Field Blank in the Sample Description on the laboratory canister tag, if applicable.
- [M.2] **IF** it is necessary to remove the laboratory canister tag to record the data,  
**THEN** remove the tag from the canister, record the data,  
**AND** immediately re-attach the tag to the canister.

4.5.4 Waste Container and Waste Container Duplicate HSG Sample Collection

---

**NOTE**

Vent Seal, Canister Gauge, Beginning Pressure, and TID number information may be recorded prior to or during sampling activities on Attachment 1.

---

---

**NOTE**

HEPA Filtration System will be used as determined by the Host site for TRU waste container sampling. Contamination and radiation surveys may be performed at any step in this section as deemed necessary by the RCT or RT.

---

- [A] **IF** the container filters have a sample septum (e.g., NFT019DS, NFT007DS),  
**THEN GO TO** step 4.5.4[E].
- [B] Ensure that all filters on the container that are **NOT** used for sampling are blocked by placing an appropriate cover over the filter medium.
- [C] Ensure HEPA System is running, if applicable.

---

**NOTE**

HSG Sampler **DOES NOT** need to prime septa if sampling through filter media sample port assembly.

---

- [D] **IF** filter **OR** waste container **DOES NOT** have a septum sample port,  
**THEN GO TO** step 4.5.4[V], **ELSE GO TO** step 4.5.4[E].

- [E] Insert filter cover blank between the protective cap and filter media for filters that have protective caps, **OR** cover filters without protective caps with latex cover material secured with a rubber o-ring, **AND** cover/block all other unused filters.
- [F] If necessary, prime the sample port as follows:
- [F.1] If applicable, remove the sample port seal screw from the container sample port, **AND** insert the penetrating tool through the sample port septum.
- [F.2] Withdraw the penetrating tool from the sample port septum.
- [F.3] Hand the penetrating tool to the RCT or RT for survey, **AND** re-use or dispose of per Host site requirements.
- [G] Insert the common needle of the duplicate sampling needle assembly through the septum of the sampling port **OR** the filter medium sample port assembly, as applicable.
- [H] Record Y in the Vent Seal block on Attachment 1, **AND** seal all vents, if applicable.
- [I] Record the canister gauge Beginning Pressure and Start Time of the Duplicate canisters on Attachment 1, **AND** simultaneously OPEN the valves for the two SUMMA<sup>®</sup> or equivalent canisters for a maximum of five minutes to allow the canister pressure of both canisters to reach equilibrium (less than or equal to 4- inches Hg).
- [J] CLOSE the SUMMA<sup>®</sup> or equivalent canister valves, **AND** record the canister End Pressures and End Times on Attachment 1.
- [K] **IF** the gauge DOES **NOT** reach less than or equal to 4-inches Hg, **THEN** obtain new SUMMA<sup>®</sup> or equivalent canister and certified duplicate needle assembly, **AND** re-sample once by repeating steps 4.5.4[B] through 4.5.4[J].
- [K.1] **IF** the second attempt FAILS, **THEN** troubleshoot and fix.
- [K.2] Return canisters (s) that did not meet the pressure requirement to analytical laboratory.

- [L] Withdraw the needle assembly from the container's sample port.
- [M] Remove the needle assembly from the canister, **AND** hand it to the RCT or RT for survey and proper disposal per Host site requirements.
- [N] Attach a valve locking device and a TID to the canister.
  - [N.1] Record the TID number on Attachment 1, if applicable.
  - [N.2] **IF** the TID is **NOT** numbered, **THEN** initial and date TID with a permanent marker, **AND** record NA on Attachment 1.
- [O] Check the pressure/vacuum gauge for an indication of an unexpected pressure change indicating a canister leak.
- [P] **IF** a canister leak is indicated, **THEN** record the canister number and document that the canister leaked in the comments section of Attachment 1 and resample the waste container using a new canister.
- [Q] Re-install the sample port seal screw if applicable, **AND** remove all covers and/or blocks.

---

**NOTE**

Data on Attachment 1 for steps 4.5.4[R.1] through 4.5.4[R.9] may be recorded prior to or during sampling activities.

---

- [R] Enter the data listed below for each Duplicate Sample canister on Attachment 1:
  - [R.1] Site (zz) (Host site abbreviation).
  - [R.2] Date (date of the sample - mmddyy, where mm is month in two digits, dd is date in two digits and yy is the last two digits of the year). **DO NOT** use slash marks when recording the date on Attachment 1.
  - [R.3] SUMMA<sup>®</sup> or equivalent Canister No. (from the metal tag on the canister) Example: EI234.
  - [R.4] Canister Size (e.g., 250 mL).
  - [R.5] Container ID No./Barcode No.

- [R.6] Waste Stream ID.
- [R.7] Cleaning Batch No. (from the laboratory canister tag).
- [R.8] Needle Assembly Batch No., if applicable.
- [R.9] Record D - Duplicate.
- [R.10] Sampler's Initials.

---

**NOTE**

Relevant data for the laboratory canister tags can be recorded prior to or during sampling activities.

---

- [S] Record the relevant data to the laboratory canister tag, including any additional information required by the analytical laboratory.
  - [S.1] Record **DUPLICATE** in the **SAMPLE DESCRIPTION** on the laboratory canister tag, if applicable.
  - [S.2] **IF** it is necessary to remove the laboratory canister tag to record data, **THEN** remove the tag from the canister, record the data, **AND** immediately re-attach the tag to the canister.
- [T] Initial and date Container Traveler, **AND** submit to VPM after sampling activities are complete, as applicable.
- [U] GO TO step 4.5.5, Collection of Waste Container HSG Sample.

---

**NOTE**

The use of various spacers may be required to ensure a good seal of the septum on the carbon filter.

---

- [V] **IF** the filter protective cap was removed (e.g., NFT-013, etc.), **THEN** sample as follows, **ELSE** GO TO step 4.5.4[W]:
  - [V.1] Remove the strip of vinyl tape, if required.
  - [V.2] Place septum and/or latex material, **AND** secure appropriately over filter, if applicable.
  - [V.3] Place septum cap over septum, if applicable.
  - [V.4] Place steel flat plate over septum and cap, **AND** secure plate with clamps if applicable.

[V.5] Gently insert sample needle of the duplicate sampling needle assembly through filter media sampling port assembly to ensure a leak tight connection between the sampling needle assembly and the container headspace directly beneath the waste container lid.

[V.6] GO TO step 4.5.4[H].

[W] **IF** the container contains a penetrable filter (e.g., NFT-020, NFT-049S, etc.),  
**THEN** sample as follows:

[W.1] Gently insert sample needle of the duplicate sampling needle assembly through filter media sampling port assembly to ensure a leak tight connection between the sampling needle assembly and the container headspace directly beneath the waste container lid.

[W.2] GO TO step 4.5.4[H].

#### 4.5.5 Collection of Waste Container HSG Sample

---

#### **NOTE**

HEPA Filtration System will be used as determined by the Host site for TRU waste container sampling activities. Contamination and radiation surveys may be performed at any step in this section as deemed necessary by the RCT or RT.

---

---

#### **NOTE**

Signature on Attachment 1 will be obtained upon completion of the sampling activities.

---

[A] Ensure that all filters on the container that are **NOT** used for sampling are blocked by placing an appropriate cover over the filter media, if applicable.

---

**NOTE**

Operator/Sampler **DOES NOT** need to prime septa if sampling through filter media sample port assembly.

---

**NOTE**

Steps 4.5.5[B] through 4.5.5[X] will be performed in sequence, as required, for each container to be sampled in the sampling batch. Container samples may be started for each container in the batch prior to completing the procedure sequence for the previous container.

---

- [B] **IF** filter **DOES NOT** have a septum sample port, **THEN GO TO** step 4.5.5[U], **ELSE GO TO** step 4.5.5[C].
  - [C] Insert filter cover blank between the protective cap and filter media for filters that have protective caps **OR** cover filters without protective caps with latex cover material secured with a rubber o-ring, **AND** cover/block all other unused filters.
  - [D] If necessary prime the sample port as follows:
    - [D.1] If applicable, remove the sample port seal screw from the container sample port, **AND** insert the penetrating tool through the sample port septum.
    - [D.2] Withdraw the penetrating tool from the sample port septum.
    - [D.3] Hand the penetrating tool to the RCT or RT for survey, **AND** re-use or dispose of per Host site requirements.
  - [E] Insert the canister needle through the septum of the sampling port **OR** the filter medium sampling port assembly, as applicable.
- 

**NOTE**

Vent Seal, canister gauge Beginning Pressure, and TID number information may be recorded prior to or during sampling activities on Attachment 1.

---

- [F] Record Y in the VENT SEAL block on Attachment 1, **AND** seal all vents, if applicable.

- [G] Record the canister gauge BEGINNING PRESSURE and START TIME on Attachment 1, **AND** OPEN the valve on the SUMMA<sup>®</sup> or equivalent canister for a maximum of five minutes to allow the canister pressure to reach equilibrium (less than or equal to 4-inches Hg).
- [H] CLOSE the valve on the SUMMA<sup>®</sup> or equivalent canister, **AND** record the canister END PRESSURE and END TIME on Attachment 1.
- [I] **IF** the canister gauge DOES **NOT** indicate collection of sample, **THEN** perform the following:
  - [I.1] CLOSE the canister valve.
  - [I.2] Remove sampling mechanism from septa.
  - [I.3] **IF** needle is clogged, **THEN** replace needle, discard clogged needle as waste according to Host site requirement, **AND** repeat steps 4.5.5[E] through 4.5.5[H].
- [J] **IF** the gauge DOES **NOT** reach less than or equal to 4-inches Hg, **THEN** obtain new SUMMA<sup>®</sup> or equivalent canister and certified needle assembly, **AND** resample once by repeating steps 4.5.5[A] through 4.5.5[H].
  - [J.1] **IF** the second attempt FAILS, **THEN** troubleshoot and fix.
  - [J.2] Return canister(s) that do not meet the pressure requirements to the analytical laboratory
- [K] Withdraw the needle assembly from the container's sample port.
- [L] Remove the needle assembly from the canister, **AND** hand it to the RCT or RT for survey and proper disposal per Host site requirements.
- [M] Attach a valve locking device and a TID to the canister.
  - [M.1] Record the TID NUMBER on Attachment 1, if applicable.
  - [M.2] **IF** the TID is **NOT** numbered, **THEN** initial and date TID with a permanent marker, **AND** record NA on Attachment 1.

- [N] Check the pressure/vacuum gauge for an indication of an unexpected pressure change indicating a canister leak.
- [O] **IF** a canister leak is indicated, **THEN** record the canister number and document that the canister leaked in the comments section of Attachment 1 and resample the waste container using a new canister.
- [P] Re-install the sample port seal screw if applicable, **AND** remove all covers and/or blocks.

---

**NOTE**

RCT or RT will conduct a contamination survey on the steel flat plate, septum cap (if applicable), and septum during the disassembly.

---

- [Q] **IF** the filter protective cap was removed, **THEN** complete the following, **ELSE** GO TO step 4.5.5[R].
  - [Q.1] Disassemble/remove the steel flat plate, if applicable.
  - [Q.2] Remove the septum cap, septum and/or latex material and securing device, if applicable.
  - [Q.3] Discard the septum and/or latex material in accordance with Host site requirements.
  - [Q.4] Place a strip of vinyl tape over the damaged filter media.

---

**NOTE**

Data on Attachment 1 for steps 4.5.5[R.1] through 4.5.5[R.9] may be recorded prior to or during sampling activities.

---

- [R] Enter the following data for each container sample on Attachment 1:
  - [R.1] Site (zz) (Host site abbreviation).
  - [R.2] Date (date of the sample - mmddyy, where mm is month in two digits, dd is date in two digits and yy is the last two digits of the year). **DO NOT** use slash marks when recording the date on Attachment 1.
  - [R.3] SUMMA<sup>®</sup> or equivalent Canister No. (from the metal tag on the canister) Example: EI234.
  - [R.4] Canister Size (e.g., 250 mL).

- [R.5] Container ID No./Barcode No.
- [R.6] Waste Stream ID.
- [R.7] Cleaning Batch No. (from the laboratory canister tag).
- [R.8] Needle Assembly Batch No.
- [R.9] Record SS - Single Sample.
- [R.10] Sampler's Initials.
- [S] Initial and date Container Traveler, **AND** submit to the VPM after sampling activities are complete, as applicable.
- [T] GO TO step 4.5.5[W].

---

**NOTE**

The use of various spacers may be required to ensure a good seal of the septum on the carbon filter.

---

- [U] **IF** filter protective cap was removed, (e.g., NFT-013, etc.), **THEN** sample as follows, **ELSE** GO TO step 4.5.5[V]:
  - [U.1] Remove the strip of vinyl tape, if required.
  - [U.2] Place septum and/or latex material, **AND** secure appropriately over filter.
  - [U.3] Place septum cap over septum, if applicable.
  - [U.4] Place steel flat plate over septum and cap, **AND** secure plate with clamps, if applicable.
  - [U.5] Gently insert sample needle assembly through filter media sampling port assembly to ensure a leak tight connection between the sampling needle assembly and the container headspace directly beneath the waste container lid.
  - [U.6] GO TO step 4.5.5[F].

- [V] **IF** the container has a penetrable filter (e.g., NFT-020, NFT049S, etc.), **THEN** sample as follows:
- [V.1] Gently insert sample needle assembly through filter media sampling port assembly to ensure a leak tight connection between the sampling needle assembly and the container headspace directly beneath the waste container lid.
- [V.2] GO TO step 4.5.5[F].

---

**NOTE**

Relevant data for the laboratory canister tags can be recorded prior to or during sampling activities.

---

- [W] Record the relevant data to the laboratory canister tag, including any additional information required by the analytical laboratory.
- [X] **IF** it is necessary to remove the laboratory canister tag to record data, **THEN** remove the tag from the canister, record the data, **AND** immediately re-attach the tag to the canister.
- [Y] Repeat steps 4.5.5[A] through 4.5.5[X] for the remaining samples using only one needle and one SUMMA<sup>®</sup> or equivalent canister assembly per sample.
- [Z] Turn HEPA blower OFF, if applicable.
- [AA] **IF** using dataloggers, **THEN** perform the following steps:
- [AA.1] Download temperature data (graphs) from temperature dataloggers to a computer.
- [AA.2] Print the dataloggers information
- [AA.3] Ensure the M&TE ID number is printed on the datalogger information.
- [BB] **IF** using a mechanical temperature recorder, **THEN** perform the following steps.
- [BB.1] Remove the chart from temperature recorder.
- [BB.2] Ensure the M&TE ID number is printed on the chart.

---

**NOTE**

If more than one qualified sampler is part of the sampling evolution, only one qualified sampler is required to sign on the SAMPLER'S SIGNATURE line on Attachment 1.

---

- [CC] **IF** a FRS does not need to be collected,  
**THEN** on Attachment 1 sign the SAMPLER'S SIGNATURE line on Attachment 1, **AND** sign the CUSTODY INITIATED BY: block of Attachment 1.

4.5.6 Collection of Field Reference Standard (FRS)

---

**NOTE**

A FRS is collected at the end of the gas sample collection or can be collected prior to all HSG operations.

---

- [A] **IF** FRS results demonstrate the QAOs for accuracy have been met,  
**THEN** proceed to Section 4.6.
- [B] Attach the standard purge assembly to the FRS gas cylinder, if applicable.
- [C] **OPEN** the FRS gas cylinder valve, **AND** set the cylinder's output regulator pressure from 0 to 1 psig.
- [D] Bleed the purge assembly to ensure no room air remains in the purge assembly.
- [E] Insert the canister needle into the purge assembly.
- [F] Record NA in the VENT SEAL block on Attachment 1.
- [G] Record the canister gauge BEGINNING PRESSURE and START TIME on Attachment 1, **AND** **OPEN** the valve on the SUMMA<sup>®</sup> or equivalent canister.
- [H] Adjust the regulator to obtain approximately atmospheric pressure of 13 to 15 psig in the SUMMA<sup>®</sup> or equivalent canister.
- [I] **CLOSE** the valve on the SUMMA<sup>®</sup> or equivalent canister, **AND** record the canister END PRESSURE and END TIME on Attachment 1.

- [J] **IF** the canister gauge **DOES NOT** read 13 to 15 psig, **THEN** obtain new SUMMA<sup>®</sup> or equivalent canister and certified needle assembly **AND** resample once by repeating steps 4.5.2[A], 4.5.2[B], **AND** 4.5.6[C] through 4.5.6[I].
  - [J.1] **IF** the second attempt **FAILS**, **THEN** troubleshoot and fix.
  - [J.2] Return canister(s) that do not meet pressure requirement to the analytical laboratory.
- [K] Withdraw the canister needle from the purge assembly, **AND** **CLOSE** the FRS cylinder shutoff valve.
- [L] Remove the needle assembly from the canister.
- [M] Attach a valve locking device, and a TID to the canister.
  - [M.1] Record the TID NUMBER on Attachment 1.
  - [M.2] **IF** the TID is **NOT** numbered, **THEN** initial and date TID with a permanent marker, **AND** record NA on Attachment 1.
- [N] Enter the data listed below, for the FRS sample on Attachment 1:
  - [N.1] Site (zz) (Host site abbreviation).
  - [N.2] Date (date of the sample - mmddyy, where mm is month in two digits, dd is date in two digits and yy is the last two digits of the year). **DO NOT** use slash marks when recording the date on Attachment 1.
  - [N.3] SUMMA<sup>®</sup> or equivalent Canister No. (from the metal tag on the canister) Example: EI234.
  - [N.4] Canister Size (e.g., 250 mL).
  - [N.5] Container ID/Barcode No. (Cylinder No. for FRS).
  - [N.6] Waste Stream ID (NA for FRS).
  - [N.7] Cleaning Batch No. (from the laboratory canister tag).

- [N.8] Needle Assembly Batch No. (created when needles are assembled).
- [N.9] Record F - Field Reference Standard.
- [N.10] Sampler's Initials.
- [O] Copy the relevant data to the laboratory canister tag, including any additional information required by the analytical laboratory.
- [O.1] Record FRS in the SAMPLE DESCRIPTION on the laboratory canister tag.
- [O.2] **IF** it is necessary to remove the laboratory canister tag to record the data,  
**THEN** remove the tag from the canister, record the data,  
**AND** immediately re-attach the tag to the canister.
- [P] Bleed out FRS from the lines and fittings.

---

**NOTE**

If more than one qualified sampler is part of the sampling evolution, only one qualified sampler is required to sign on the SAMPLER'S SIGNATURE line on Attachment 1.

---

- [Q] On Attachment 1 sign on the SAMPLER'S SIGNATURE line, **AND** sign the CUSTODY INITIATED BY: block.

#### 4.6 Pre-Transport/Shipping Activities of Canister Samples to Laboratory

---

**NOTE**

Sample custody will be maintained by ensuring that samples:

- are in the possession of an authorized individual
  - are in that individual's view
  - are in a sealed or locked container controlled by that individual
  - are in a secure controlled access area
- 

4.6.1 Prepare all the canisters from the Field Batch for shipping by verifying a valve locking device TID, **AND** Canister Tag has been installed on each individual SUMMA<sup>®</sup> or equivalent canister.

4.6.2 Verify the TID Number for each canister has been recorded on Attachment 1.

- 4.6.3 Place the canisters in a holding area secured by TID(s), along with Attachment 1, if applicable.
- [A] Install **OR** verify installed a temperature recorder in the holding area, **AND** record the M&TE ID Number on Attachment 1.
  - [B] Record the holding area TID Number(s) on Attachment 1.
  - [C] **IF** the TID is blank and **DOES NOT** contain a number, **THEN** initial and date TID with permanent marker, **AND** record on Attachment 1.
- 4.6.4 **IF** transferring custody of the containers, **THEN** perform the following:
- [A] Ensure the RELINQUISHED BY box is signed, dated and time recorded by the Custody Initiated By Sampler or Received By Individual on Page 2 of Attachment 1.
  - [B] Individual taking custody will sign, date and record time in RECEIVED BY box on Page 2 of Attachment 1.
    - [B.1] Check for damage on SUMMAs<sup>®</sup> or equivalent and observable changes in end pressures.
      - (a) Report any damage to relinquisher, **AND** note in comments section on Page 2 of Attachment 1.

#### 4.7 Final Disposition of SUMMA<sup>®</sup> or equivalent Canister to Laboratory

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##### **NOTE**

Shipping/transport of SUMMA<sup>®</sup> or equivalent canisters will be processed through the Host site shipping/transportation department.

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- 4.7.1 Review the temperature recorder to verify the sample canisters in the holding area have been maintained in the temperature range of 0° C to 40° C.
- 4.7.2 Check for damage on SUMMAs<sup>®</sup> or equivalent canisters and observable changes in end pressures.
- 4.7.3 Package the canisters into the final container for shipment/transport to the analytical laboratory, **AND** add a minimum of one min/max thermometer.

4.7.4 Record the following on Attachment 1, Page 2 of 2 for the Min/Max thermometer:

[A] M&TE ID No.

[B] Calibration Due Date

[C] Initials of person making entry and date

4.7.5 Record the TID number that will be used on the outside of the case, if applicable, as well as the date and initials of the person applying the TID on Page 2 of Attachment 1.

4.7.6 If applicable, record the shipment tracking number and method of shipping or NA on Attachment 1, Page 2 of 2.

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**NOTE**

The last person to relinquish the COC will be the person who will be applying the TID on the shipping container.

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4.7.7 Sign the RELINQUISHED BY and DATE/TIME block on Attachment 1.

4.7.8 Make a photocopy of Attachment 1.

4.7.9 Place original copy of Attachment 1 into the shipping container, **AND** apply the TID to the outside of the shipping container, **AND** initial and date with permanent marker.

4.7.10 Place a photocopy of Attachment 1 in the BDR Holding File.

4.7.11 Complete a Host site Shipment Request Form **OR** equivalent documentation, if applicable.

4.7.12 Deliver the container(s) with the SUMMA<sup>®</sup> or equivalent canister samples to the Host site/responsible personnel for shipping/transporting the canisters to the analytical laboratory.

## 5.0 RECORDS

- 5.1 Records generated during the performance of this procedure are maintained as QA records in accordance with CCP-QP-008, *CCP Records Management*. The records are the following:

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### NOTE

The records identified in step 5.1.1 are compiled into the BDR in CCP-TP-106, *CCP Headspace Gas Sampling Batch Data Report Preparation*.

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#### 5.1.1 QA/Lifetime

- [A] Attachment 1 – Chain of Custody/Canister Tag
- [B] Attachment 2 – Sample Container Data Form
- [C] Shipment Request Form (or equivalent), if applicable.

Table 1. Headspace Gas Drum Age Criteria Sampling Scenario

Scenario	Description
1.	<p>A. Unvented containers without rigid poly liners are sampled through the container lid at the time of venting.</p> <p>B. Unvented containers with unvented rigid poly liners are sampled through the rigid poly liner at the time of venting or prior to venting.</p> <p>C. Vented containers with unvented rigid poly liners are sampled through the rigid poly liner at the time of venting or prior to venting.</p> <p>D. Unvented containers with vented rigid poly liners are sampled through the container lid at the time of venting.</p>
2.	Containers that have met the criteria for Scenario 1 and then are vented, but not sampled at the time of venting. <sup>a</sup>
3.	Containers (i.e., 55-gallon drums, 85-gallon drums, 100-gallon drums, SWBs, Ten-Drum Overpacks (TDOPs) and pipe components) that are initially packaged in a vented condition and sampled in the container headspace and containers that are not sampled under Scenario 1 or 2.

<sup>a</sup> Containers that have not met the Scenario 1 DAC at the time of venting must be categorized under Scenario 3. This requires the additional information required of each container in Scenario 3 (i.e., determination of packaging configuration), and such containers can only be sampled after meeting the appropriate Scenario 3 DAC.

Table 2. Scenario 1 Drum Age Criteria (in days) Matrix

<b>Summary Category Group</b>	<b>DAC (days)</b>
S5000	53

Note: Containers that are sampled using the Scenario 1 DAC do not require information on the packaging configuration because the Scenario 1 DAC is based on a bounding packaging configuration. In addition, information on the rigid liner vent hole presence and diameter do not apply to containers that are sampled using the Scenario 1 DAC because they are unvented prior to sampling.

Table 3. Scenario 2 Drum Age Criteria (in days) Matrix

	Summary Category Group S5000			
Filter H <sub>2</sub> Diffusivity <sup>a</sup> (mol/s/mod fraction)	Rigid Liner Vent Hole Diameter (in) <sup>b</sup>			
	0.30	0.375	0.75	1.0
1.9 x 10 <sup>-6</sup>	29	22	13	12
3.7 x 10 <sup>-6</sup>	25	20	12	11
3.7 x 10 <sup>-5</sup>	7	6	6	4

- a The documented filter H<sub>2</sub> diffusivity must be greater than or equal to the listed value to use the DAC for the listed filter H<sub>2</sub> diffusivity (e.g., a container with a filter H<sub>2</sub> diffusivity of 4.2 x 10<sup>-6</sup> must use a DAC for a filter with a 3.7 x 10<sup>-6</sup> filter H<sub>2</sub> diffusivity). If a filter H<sub>2</sub> diffusivity for a container is undocumented or unknown or is less than 1.9 x 10<sup>-6</sup> filter H<sub>2</sub> diffusivity, a filter of known H<sub>2</sub> diffusivity that is greater than or equal to 1.9 X 10<sup>-6</sup> filter H<sub>2</sub> diffusivity must be installed prior to initiation of the relevant DAC period.
- b The documented rigid liner vent hole diameter must be greater than or equal to the listed value to use the DAC for the listed rigid liner vent hole diameter (e.g., a container with a rigid liner vent hole of 0.5 in. must use a DAC for a rigid liner vent hole of 0.375 in.). If the rigid liner vent hole diameter for a container is undocumented during packaging that container must use a DAC for a rigid liner vent hole diameter of 0.30 in.

Note: Containers that are sampled using the Scenario 2 DAC do not require information on the packaging configuration because the Scenario 2 DAC are based on a bounding packaging configuration.

Table 4. Scenario 3 Packaging Configuration Groups

Packaging Configuration Group	Covered S5000 Packaging Configuration Groups
Packaging Configuration Group 1, 55-gal. drums <sup>a</sup>	<ul style="list-style-type: none"> <li>• No layers of confinement, filtered inner lid<sup>b</sup></li> <li>• No inner bags, no liner bags (bounding case)</li> </ul>
Packaging Configuration Group 2, 55-gal. drums <sup>a</sup>	<ul style="list-style-type: none"> <li>• 1 inner bag</li> <li>• 1 filtered inner bag</li> <li>• 1 liner bag</li> <li>• 1 filtered liner bag</li> <li>• 1 inner bag, 1 liner bag</li> <li>• 1 filtered inner bag, 1 filtered liner bag</li> <li>• 2 inner bags</li> <li>• 2 filtered inner bags</li> <li>• 2 inner bags, 1 liner bag</li> <li>• 2 filtered inner bags, 1 filtered liner bag</li> <li>• 3 inner bags</li> <li>• 3 filtered inner bags</li> <li>• 3 filtered inner bags, 1 filtered liner bag</li> <li>• 3 inner bags, 1 liner bag (bounding case)</li> </ul>
Packaging Configuration Group 3, 55-gal. drums <sup>a</sup>	<ul style="list-style-type: none"> <li>• 2 liner bags</li> <li>• 2 filtered liner bags</li> <li>• 1 inner bag, 2 liner bags</li> <li>• 1 filtered inner bag, 2 filtered liner bags</li> <li>• 2 inner bags, 2 liner bags</li> <li>• 2 filtered inner bags, 2 filtered liner bags</li> <li>• 3 filtered inner bags, 2 filtered liner bags</li> <li>• 4 inner bags</li> <li>• 3 inner bags, 2 liner bags</li> <li>• 4 inner bags, 2 liner bags (bounding case)</li> </ul>

Table 4. Scenario 3 Packaging Configuration Groups (Continued)

Packaging Configuration Group	Covered S5000 Packaging Configuration Groups
Packaging Configuration Group 4, pipe components	<ul style="list-style-type: none"> <li>No layers of confinement inside a pipe component</li> <li>1 filtered inner bag, 1 filtered metal can inside a pipe component</li> <li>2 inner bags inside a pipe component</li> <li>2 filtered inner bags inside a pipe component</li> <li>2 filtered inner bags, 1 filtered metal can inside a pipe component</li> <li>2 inner bags, 1 filtered metal can inside a pipe component (bounding case)</li> </ul>
Packaging Configuration Group 5, Standard Waste Box or Ten-Drum Overpack <sup>a</sup>	<ul style="list-style-type: none"> <li>No layers of confinement</li> <li>1 SWB liner bag bounding case)</li> </ul>
Packaging Configuration Group 6, Standard Waste Box or Ten-Drum Overpack <sup>a</sup>	<ul style="list-style-type: none"> <li>Any combination of inner and/or liner bags that is less than or equal to 6</li> <li>5 inner bags, 1 SWB liner bag (bounding case)</li> </ul>
Packaging Configuration Group 7, 85-gal. Drums and 100-gal. Drums <sup>a</sup>	<ul style="list-style-type: none"> <li>No inner bags, no liner bags, no rigid liner, filtered inner lid (bounding case)<sup>b</sup></li> <li>No inner bags, no liner bags, no rigid liner</li> </ul>
Packaging Configuration Group 8, 85-gal. Drums and 100-gal. Drums <sup>a</sup>	<ul style="list-style-type: none"> <li>4 inner bags and 2 liner bags, no rigid liner, filtered inner lid (bounding case)<sup>b</sup></li> </ul>

<sup>a</sup> If specific Packaging Configuration Groups cannot be determined based on the data collected during packaging and/or repackaging, a conservative default Packaging Configuration Group of 3 for 55-gal. drums and 6 for SWBs must be assigned provided the 55-gal. drums do not contain pipe component packaging. If pipe components are present as packaging in the 55-gal. drums, the pipe components must be sampled following the requirements for Packaging Configuration Group 4.

<sup>b</sup> A “filtered inner lid” is the inner lid on a double lid drum that contains a filter.

Definitions:

Liner Bags: One or more optional plastic bags that are used to control radiological contamination. Liner bags for drums have a thickness of approximately 11 mils. SWB liner bags have a thickness of approximately 14 mils. Liner bags are typically similar in size to the container.

Inner Bags: One or more optional plastic bags that are used to control radiological contamination. Inner bags have a thickness of approximately 5 mils and are typically smaller than liner bags.

Table 5. Scenario 3 Drum Age Criteria (in days) Matrix for S5000 Waste by Packaging Configuration Group

Packaging Configuration Group 1						
Rigid Liner Vent Hole Diameter <sup>b</sup>						
Filter H <sub>2</sub> Diffusivity <sup>a</sup> (mol/s/mol fraction)	0.3-inch Diameter Hole	0.375-inch Diameter Hole	0.75-inch Diameter Hole	1-inch Diameter Hole	No Liner Lid	No Liner
1.9 x 10 <sup>-6</sup>	131	95	37	24	4	4
3.7 x 10 <sup>-6</sup>	111	85	36	24	4	4
3.7 x 10 <sup>-5</sup>	28	28	23	19	4	4

Packaging Configuration Group 2						
Rigid Liner Vent Hole Diameter <sup>b</sup>						
Filter H <sub>2</sub> Diffusivity <sup>a</sup> (mol/s/mol fraction)	0.3-inch Diameter Hole	0.375-inch Diameter Hole	0.75-inch Diameter Hole	1-inch Diameter Hole	No Liner Lid	No Liner
1.9 x 10 <sup>-6</sup>	175	138	75	60	30	11
3.7 x 10 <sup>-6</sup>	152	126	73	59	30	11
3.7 x 10 <sup>-5</sup>	58	57	52	47	28	8

Packaging Configuration Group 3						
Rigid Liner Vent Hole Diameter <sup>b</sup>						
Filter H <sub>2</sub> Diffusivity <sup>a</sup> (mol/s/mol fraction)	0.3-inch Diameter Hole	0.375-inch Diameter Hole	0.75-inch Diameter Hole	1-inch Diameter Hole	No Liner Lid	No Liner
1.9 x 10 <sup>-6</sup>	199	161	96	80	46	16
3.7 x 10 <sup>-6</sup>	175	148	93	79	46	16
3.7 x 10 <sup>-5</sup>	72	72	67	62	42	10

Table 5. Scenario 3 Drum Age Criteria (in days) Matrix for S5000 Waste by Packaging Configuration Group (Continued)

Packaging Configuration Group 4	
Filter H <sub>2</sub> Diffusivity <sup>a</sup> (mol/s/mol fraction)	Headspace Sample Taken Inside Pipe Component
>1.9 x 10 <sup>-6</sup>	152

Packaging Configuration Group 5	
Filter H <sub>2</sub> Diffusivity <sup>a,c</sup> (mol/s/mol fraction)	Headspace Sample Taken Inside SWB
>7.4 x 10 <sup>-6</sup> (SWB)	15
3.33 x 10 <sup>-5</sup> (TDOP)	15

Packaging Configuration Group 6	
Filter H <sub>2</sub> Diffusivity <sup>a,c</sup> (mol/s/mol fraction)	Headspace Sample Taken Inside SWB
>7.4 x 10 <sup>-6</sup> (SWB)	56
3.33 x 10 <sup>-5</sup> (TDOP)	56

Packaging Configuration Group 7 <sup>d</sup>			
Filter H <sub>2</sub> Diffusivity <sup>a</sup> (mol/s/mol fraction)	Inner Lid Filter Vent Minimum H <sub>2</sub> Diffusivity (mol/s/mol fraction) <sup>a</sup>		
	7.4 x 10 <sup>-6</sup>	1.85 x 10 <sup>-5</sup>	9.25 x 10 <sup>-5</sup> e
3.7 x 10 <sup>-6</sup>	13	7	2
7.4 x 10 <sup>-6</sup>	10	6	2
1.85 x 10 <sup>-5</sup>	6	4	2

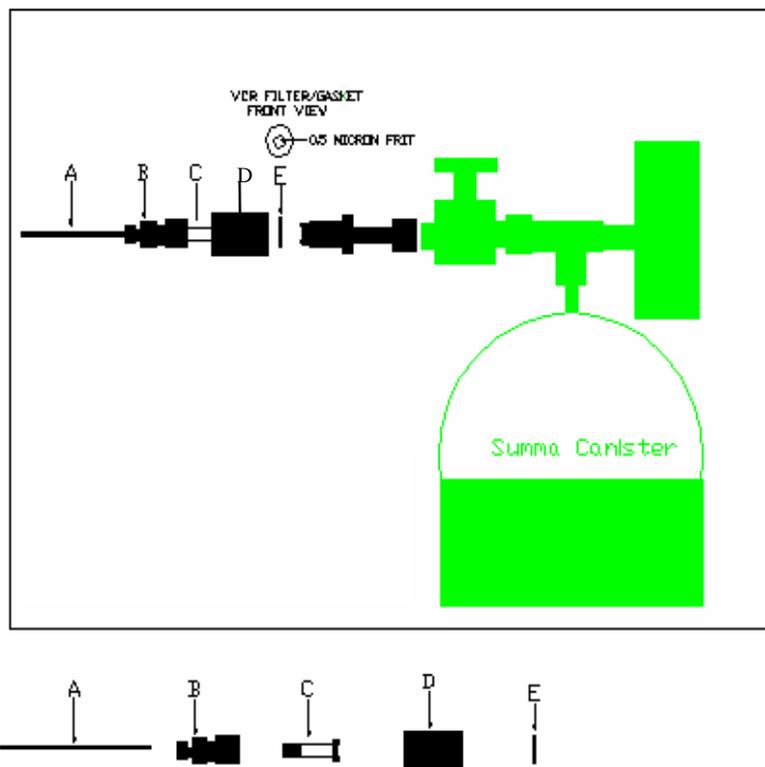
Packaging Configuration Group 8	
Filter H <sub>2</sub> Diffusivity <sup>a</sup> (mol/s/mol fraction)	Inner Lid Filter Vent Minimum H <sub>2</sub> Diffusivity (mol/s/mol fraction)
	7.4 x 10 <sup>-6</sup>
3.7 x 10 <sup>-6</sup>	21

<sup>a</sup> The documented filter H<sub>2</sub> diffusivity must be greater than or equal to the listed value to use the DAC for the listed filter H<sub>2</sub> diffusivity (e.g., a container with a filter H<sub>2</sub> diffusivity of 4.2 x 10<sup>-6</sup> must use a DAC for a filter with a 3.7 x 10<sup>-6</sup> filter H<sub>2</sub> diffusivity). If a filter H<sub>2</sub> diffusivity for a container is undocumented or unknown or is less than 1.9 x 10<sup>-6</sup> filter H<sub>2</sub> diffusivity, a filter of known H<sub>2</sub> diffusivity that is greater than or equal to 1.9 x 10<sup>-6</sup> filter H<sub>2</sub> diffusivity must be installed prior to initiation of the relevant DAC period.

Table 5. Scenario 3 Drum Age Criteria (in days) Matrix for S5000 Waste by Packaging Configuration Group (Continued)

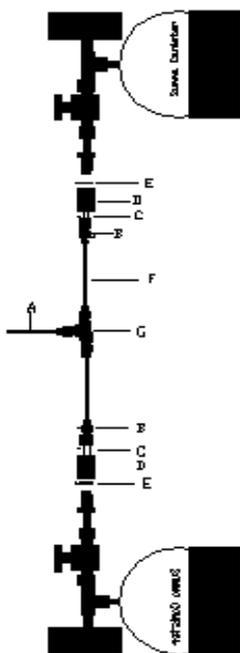
- b The documented rigid liner vent hole diameter must be greater than or equal to the listed value to use the DAC for the listed rigid liner vent hole diameter (e.g., a container with a rigid liner vent hole of 0.5 in. must use a DAC for a rigid liner vent hole of 0.375 in.). If the rigid liner vent hole diameter for a container is undocumented during packaging, repackaging, and/or venting, that container must use a DAC for a rigid liner vent hole diameter of 0.30 in.
- c The filter H<sub>2</sub> diffusivity for SWBs or TDOPs is the sum of the diffusivities for all of the filters on the container because SWBs and TDOPs have more than 1 filter.
- d Headspace sample taken between inner and outer drum lids. If headspace sample is taken inside the filtered inner drum lid prior to placement of the outer drum lid, then a DAC value of 2 days may be used. Footnote "e" is also applicable. Packaging Configuration Group 7 DAC values apply to drums with up to two lids.
- e While a DAC value of 2 days may be determined, containers must comply with the equilibrium requirements (i.e., 72 hours at 18°C or higher). The equilibrium requirement for headspace gas sampling shall be met separately.

Figure 1. Single Canister Sampling Components



- A -1/16 in. O.D. SIDE PORT NEEDLE
- B -1/4 in. x 1/16 in. SWAGELOK REDUCING UNION
- C -1/4 in. SWAGELOK TO VCR ADAPTER
- D -1/4 in. VCR FEMALE CONNECTOR
- E - SS VCR FILTER GASKET (0.5 MICRONS)

Figure 2. Duplicate Canister Sampling Components



- A - 1/16 in. O.D. SIDE PORT NEEDLE
- B - 1/4 in. x 1/16 in. SWAGELOK REDUCING UNION
- C - 1/4 in. SWAGELOK TO VCR ADAPTER
- D - 1/4 in. VCR FEMALE CONNECTOR
- E - SS VCR FILTER GASKET (0.5 MICRONS)
- F - 1/16 in. O.D. TEFLON TUBING  
(6 in. TO 8 in. LONG)
- G - 1/16 in. SWAGELOK UNION TEE



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**CCP Sampling of TRU Waste Containers**

Attachment 1 – Chain of Custody/Canister Tag (Continued)

Chain of Custody #: \_\_\_\_\_

Page 2 of 2

Field Batch Number:					
Comments:		Instrument Section	M&TE ID No.	Calibration Due Date	Initials/Date
Analytical Laboratory - ECL		Pressure Meter			
Shipping Tracking #	Method of Shipping	Thermometer			
		Min /Max Thermometer			
Analysis Requested VOC		Preservation Method: 0 - 40°C			
TID Number(s)		TID Initials and date:			
Custody Initiated By: (Sampler Name/Organization)		Date/Time			
Relinquished By: (Name/Organization)		Date/Time	Received By: (Name/Organization)	Date/Time	
Relinquished By: (Name/Organization)		Date/Time	Received By: (Name/Organization)	Date/Time	
Relinquished By: (Name/Organization)		Date/Time	Received By: (Name/Organization)	Date/Time	
Relinquished By: (Name/Organization)		Date/Time	Received By: (Name/Organization)	Date/Time	
Final Disposition By: (Name/Organization)		Date/Time	Disposition:		



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**CCP Sampling of TRU Waste Containers**

Attachment 2 – Sample Container Data Form (Continued)

Page 2 of 2

Field Batch Number:									
Container ID	Closure Date	Vent Date	Permit Required Equilibrium Time (Days)	Container Age (Days)	Container Fill Factor (%)	Can This Container Be Sampled? (Y / N)	Temperature Recorder M&TE /ID No.:		
							Temperature Recorder Calibration Due Date:		
							72 – Hour Container Equilibrium		
							Start Date/Time	End Date/Time	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									

HSG Sampler: \_\_\_\_\_  
Print Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date