

# **CH-TRU WASTE CONTENT CODES (CH-TRUCON)**

**Revision 1  
October 2004**



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## PREFACE

This document, DOE/WIPP 01-3194, CH-TRU Waste Content Codes (CH-TRUCON), Revision 1, supercedes the following documents:

- CH-TRUCON, Revision 0
- DOE/WIPP 89-004, TRUPACT-II Content Codes (TRUCON), Revision 15.1
- List of Chemicals and Materials in Content Codes for TRUPACT-II, July 2004.

The CH-TRUCON, Revision 0, was submitted with the Safety Analysis Report for the HalfPACT packaging to describe the contents authorized for shipment in the HalfPACT. DOE/WIPP 89-004 and the List of Chemicals and Materials in Content Codes for TRUPACT-II have heretofore described contents authorized for shipment in the TRUPACT-II. DOE/WIPP 01-3194 consolidates CH-TRUCON, Revision 0, TRUCON, Revision 15.1, and the List of Chemicals and Materials in Content Codes for TRUPACT-II to describe the contents authorized for transport in both the TRUPACT-II and HalfPACT packagings. All content codes contained in this document may be used for transport in either the TRUPACT-II or HalfPACT packaging.

This document has been prepared using Revision 15.1 of the TRUCON as the baseline for the most current descriptions of contact-handled transuranic wastes in the U.S. Department of Energy system. However, this version of the document is considered to be a “new” document and therefore contains no redlines.

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**CONTENT CODE ASSESSMENTS**

|   |      |
|---|------|
| Argonne National Laboratory - East                      | AE-1 |
| Argonne National Laboratory - West                      | AW-1 |
| Idaho National Engineering and Environmental Laboratory | ID-1 |
| Los Alamos National Laboratory                          | LA-1 |
| Lawrence Livermore National Laboratory                  | LL-1 |
| Mound Laboratory  | MD-1 |
| Nevada Test Site  | NT-1 |
| Oak Ridge National Laboratory                           | OR-1 |
| Rocky Flats Environmental Technology Site               | RF-1 |
| Richland Hanford  | RH-1 |
| Sandia National Laboratories/California                 | SL-1 |
| Small Quantity  | SQ-1 |
| Savannah River Site                                     | SR-1 |

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## INTRODUCTION

The CH-TRU Waste Content Codes (CH-TRUCON) document describes the inventory of the U.S. Department of Energy (DOE) CH-TRU waste within the transportation parameters specified by the Contact-Handled Transuranic Waste Authorized Methods for Payload Control (CH-TRAMPAC). The CH-TRAMPAC defines the allowable payload for the Transuranic Package Transporter-II (TRUPACT-II) and HalfPACT packagings. This document is a catalog of TRUPACT-II and HalfPACT authorized contents and a description of the methods utilized to demonstrate compliance with the CH-TRAMPAC. A summary of currently approved content codes by site is presented in Table 1.

The CH-TRAMPAC describes “shipping categories” that are assigned to each payload container. Multiple shipping categories may be assigned to a single content code. A summary of approved content codes and corresponding shipping categories is provided in Table 2, which consists of Tables 2A, 2B, and 2C. Table 2A provides a summary of approved content codes and corresponding shipping categories for the “General Case,” which reflects the assumption of a 60-day shipping period as described in the CH-TRAMPAC and Appendix 3.4 of the CH-TRU Payload Appendices. For shipments to be completed within an approximately 1,000-mile radius, a shorter shipping period of 20 days is applicable as described in the CH-TRAMPAC and Appendix 3.5 of the CH-TRU Payload Appendices. For shipments to WIPP from Los Alamos National Laboratory (LANL), Nevada Test Site, and Rocky Flats Environmental Technology Site, a 20-day shipping period is applicable. Table 2B provides a summary of approved content codes and corresponding shipping categories for “Close-Proximity Shipments” (20-day shipping period). For shipments implementing the controls specified in the CH-TRAMPAC and Appendix 3.6 of the CH-TRU Payload Appendices, a 10-day shipping period is applicable. Table 2C provides a summary of approved content codes and corresponding shipping categories for “Controlled Shipments” (10-day shipping period).

Unless otherwise noted, shipping category calculations shown in Table 2 are based on the following assumptions:

- Each filtered plastic bag has a diffusivity of  $1.075\text{E-}05$  moles per second per mole fraction
- Each filtered metal can has a diffusivity of  $1.9\text{E-}06$  moles per second per mole fraction
- Each pipe component has a diffusivity of  $1.9\text{E-}06$  moles per second per mole fraction
- Each 55-gallon drum has a rigid liner punctured with a 0.3-inch diameter hole
- Each 85-gallon drum used to overpack a 55-gallon drum has a diffusivity of  $3.7\text{E-}06$  moles per second per mole fraction
- Each standard waste box (SWB) used to overpack 55-gallon drums (SWB overpack) has a diffusivity of  $7.4\text{E-}06$  moles per second per mole fraction.

A content code is defined by the following components:

- A two-letter site abbreviation that designates the physical location of the generated/stored waste (e.g., LA for LANL). The site-specific letter designations for each of the sites are provided in Table 3.
- A three-digit code that designates waste generation relative to implementation of a formal certification program and the physical and chemical form of the waste (e.g., content code 117 denotes TRU Metal Waste generated under a formal certification program). The first number of this three-digit code is a “1” or “2,” differentiating between “100 Series” and “200 Series”

waste. Payload containers in the 100 Series are generated under a formal certification program. Payload containers in the 200 Series are generated prior to site implementation of a formal certification program. The second and third numbers of the three-digit code designate the physical and chemical form of the waste. Table 4 lists the generic content codes that are used, the waste type for each code, and a brief description of each content code.

- Content codes are further defined as subcodes by an alpha trailer after the three-digit code to allow segregation of wastes that differ in one or more parameter(s). For example, the alpha trailers of the subcodes LA 117A and LA 117B are used to differentiate between LANL metal waste packaged within a maximum of four layers of plastic bags (LA 117A) and LANL metal waste packaged within a single plastic bag (LA 117B).

A “numeric” shipping category notation was introduced in June 1999. Sites may continue to use the old “alpha-numeric” shipping category designation. Cross correlation lists (alpha-numeric/numeric and numeric/alpha-numeric) are provided in Tables 5 and 6. Definitions and examples of the two shipping category notations are provided in Table 7.

As specified in the CH-TRAMPAC, sites have the option of taking credit for the use of dose-dependent G values based on matrix depletion for certain wastes (i.e., Waste Material Type II.1 and Waste Type III). These dose-dependent G values are reflected in the “YYYY” (G value) portion of the numeric shipping category and have no effect on the waste type (“XX”) or resistance (“ZZZZ”) portions of the numeric shipping category. All shipping categories listed in Table 2 may be used with either the dose-dependent or non-dose-dependent YYYY values, as applicable. Note: For waste described by an alpha-numeric shipping category, the site must first convert the alpha-numeric shipping category to a numeric shipping category, and then revise the shipping category to reflect the dose-dependent G value. A correlation of waste material types, G values, and numeric shipping category notation, both with and without credit for matrix depletion, is provided in the CH-TRAMPAC.

Table 8 is a list of acronyms and abbreviations used in this document.

Requests for new or revised content codes may be submitted to the WIPP CH-TRU Payload Engineer for review and approval, provided all CH-TRAMPAC requirements are met.

The format for content codes is as follows:

- Content Code
- Content Description
- Storage Site (if applicable)
- Generating Site
- Waste Description
- Generating Source(s)
- Waste Form
- Waste Packaging
- Assay
- Free Liquids
- Explosives/Compressed Gases
- Pyrophorics
- Corrosives
- Chemical Compatibility
- Payload Container Venting and Aspiration



- Additional Criteria
- Shipping Category
- Maximum Allowable Wattage.

CONTENT CODE: Identifies the two-letter site abbreviation that designates the physical location of the waste and the three-digit code that designates waste generation relative to implementation of a formal certification program and the physical and chemical form of the waste. Content code identifiers are defined in Tables 3 and 4.

CONTENT DESCRIPTION: Identifies the physical form of the waste (e.g., describing whether it is inorganic or organic, solidified or solid). This is similar to the waste material type titles in the CH-TRAMPAC.

STORAGE SITE: Provides the location of the waste, if the location is different than the generating site.

GENERATING SITE: Provides the location of waste generation.

WASTE DESCRIPTION: Provides basic information regarding the nature and main components of the waste.

GENERATING SOURCE(S): Lists processes and/or buildings at each site that generate the waste in each content code.

WASTE FORM: Provides more detailed information on the waste contents, how the waste is processed, and specific information about the chemistry of constituents.

WASTE PACKAGING: Describes, in detail, techniques necessary for waste packaging in a given content code. This includes a description of the waste confinement layers, the number of layers of confinement used in packaging waste, and the mechanism for bag, can, or container closure. This section contains the Waste Packaging Description Table that details the waste packaging configurations for all the codes under the content code (e.g., LA 117A, LA 117B, etc., under LA 117).

ASSAY: Describes the types of radioactive materials measurement techniques or other methods utilized to obtain fissile material content and decay heat values for a particular content code.

FREE LIQUIDS: Describes the authorized procedures used by the sites to ensure that the limits imposed on free liquids (<1% by volume) are met for each content code.

EXPLOSIVES/COMPRESSED GASES: Identifies the methods used to preclude the presence of explosives or compressed gases.

PYROPHORICS: Describes the controls in place at each site to ensure that nonradionuclide pyrophoric materials in TRU waste are excluded, reacted to render nonpyrophoric, or are immobilized prior to placement in waste.

CORROSIVES: Describes the controls in place to ensure that corrosive materials in TRU waste are either not present or are neutralized or immobilized prior to placement in a payload container.

CHEMICAL COMPATIBILITY: Describes the controls in place to ensure chemical compatibility for the waste contents and the TRUPACT-II and HalfPACT packagings. All chemicals/materials in the waste for a specific content code are restricted to the allowable chemical lists and the 5% limit on total materials not listed as specified in the CH-TRAMPAC. The approved chemical list for each content code in the

CH-TRUCON document is specified in Appendix A, List of Chemicals and Materials in CH-TRU Waste Content Codes.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers that have been stored in an unvented condition (i.e., no filter and/or unpunctured liner) must be aspirated to ensure equilibration of any gases that may have accumulated in the closed container. This procedure is required only for unvented waste. A detailed explanation of the procedures and, specifically, the options for deriving aspiration times are provided in the CH-TRAMPAC and in Appendix 3.7 of the CH-TRU Payload Appendices.

ADDITIONAL CRITERIA: Provides details on how the waste qualifies for shipment by meeting additional transport requirements (e.g., venting payload containers and liners).

SHIPPING CATEGORY: Shipping categories based on the above parameters for each content code are summarized in Table 2, which consists of Tables 2A, 2B, and 2C.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattage limit for each shipping category is determined in accordance with the CH-TRAMPAC.

**TABLE 1**  
**SUMMARY OF CONTENT CODES BY SITE**

| Content<br>Code(s) <sup>b</sup> | Waste Generator/Shipper Site <sup>a</sup> |       |       |      |      |       |     |      |       |    |        |    |     |
|---------------------------------|---|-------|-------|------|------|-------|-----|------|-------|----|--------|----|-----|
|                                 | ANL-E                                     | ANL-W | INEEL | LANL | LLNL | MOUND | NTS | ORNL | RFETS | RH | SNL/CA | SO | SRS |
| 111/211                         | X   | X     | X     | X    | X    | X     | X   |      | X     | X  | X      | X  |     |
| 112/212                         |   |       | X     | X    |      |       |     |      | X     | X  |        | X  |     |
| 113/213                         |   |       | X     |      | X    |       |     |      | X     |    |        |    |     |
| 114/214                         |   |       | X     | X    |      |       |     |      | X     | X  |        | X  |     |
| 115/215                         |   |       | X     | X    |      |       |     |      | X     |    |        |    |     |
| 116/216                         | X   |       | X     | X    | X    | X     | X   |      | X     |    |        |    |     |
| 117/217                         |   |       | X     | X    |      | X     |     |      | X     | X  |        |    | X   |
| 118/218                         |   |       | X     | X    |      |       |     |      | X     |    |        |    |     |
| 119/219                         |   |       | X     | X    | X    |       | X   |      | X     |    |        |    |     |
| 120/220                         |   |       |       | X    |      |       |     |      |       |    |        | X  |     |
| 121/221                         |   | X     | X     |      |      |       |     |      | X     |    |        | X  |     |
| 122/222                         |   | X     | X     | X    |      |       |     |      | X     | X  |        | X  | X   |
| 123/223                         |   |       | X     | X    |      |       |     |      | X     | X  |        |    |     |
| 124/224                         |   |       | X     | X    | X    |       |     |      | X     |    |        |    |     |
| 125/225                         |   | X     | X     | X    | X    |       | X   | X    |       | X  |        | X  | X   |
| 126/226                         |   |       | X     | X    |      |       |     |      | X     |    |        | X  |     |
| 127/227                         |   | X     | X     |      |      |       |     |      | X     |    |        |    |     |
| 128/228                         |   |       |       |      |      |       |     |      |       |    |        |    |     |
| 129/229                         | X   |       |       |      |      |       |     |      |       |    |        |    |     |
| 130/230                         |   |       | X     |      |      |       |     |      | X     | X  |        |    |     |
| 131/231                         |   |       |       |      |      |       |     |      | X     |    |        |    |     |
| 132/232                         |   |       |       |      |      |       |     |      | X     |    |        |    |     |

<sup>a</sup> Refer to Table 3 for the complete name of each site.

<sup>b</sup> Refer to Table 4 for descriptions for each content code.

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**TABLE 2**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**

Table 2 consists of the following tables:

- Table 2A, Summary of Approved Content Codes and Corresponding Shipping Categories for General Case (60-day Shipping Period)
- Table 2B, Summary of Approved Content Codes and Corresponding Shipping Categories for Close-Proximity Shipments (20-day Shipping Period)
- Table 2C, Summary of Approved Content Codes and Corresponding Shipping Categories for Controlled Shipments (10-day Shipping Period)

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**TABLE 2A**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| AE 111A<br>AE 211A | 10 0160 0147      | Drum              | 1.9   | No layers of confinement                                       |
|                    | 10 0160 0111      |                   | 3.7   |  |
|                    | 10 0160 0207      | SWB Overpack      | 1.9   |  |
|                    | 10 0160 0172      |                   | 3.7   |  |
| AE 111C<br>AE 211C | 10 0160 0168      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag           |
|                    | 10 0160 0133      |                   | 3.7   |  |
|                    | 10 0160 0229      | SWB Overpack      | 1.9   |  |
|                    | 10 0160 0193      |                   | 3.7   |  |
| AE 116A<br>AE 216A | 30 0340 0127      | Drum              | 1.9   | No layers of confinement                                       |
|                    | 30 0340 0101      |                   | 3.7   |  |
|                    | 30 0340 0166      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0141      |                   | 3.7   |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |
|                    | 30 0340 0013      | Direct Load TDOP  | 3.7   |  |
| AE 116B<br>AE 216B | 30 0340 0136      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 30 0340 0110      |                   | 3.7   |  |
|                    | 30 0340 0176      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0150      |                   | 3.7   |  |
|                    | 30 0340 0038      | SWB               | 3.7   |  |
|                    | 30 0340 0023      | Direct Load TDOP  | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| AE 116C<br>AE 216C | 30 0340 0306      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is an inner bag         |
|                    | 30 0340 0280      |                   | 3.7  |   |
|                    | 30 0340 0346      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0320      |                   | 3.7  |   |
|                    | 30 0340 0208      | SWB               | 3.7  |   |
|                    | 30 0340 0193      | Direct Load TDOP  | 3.7  |   |
| AE 116D<br>AE 216D | 30 0340 0148      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 30 0340 0122      |                   | 3.7  |   |
|                    | 30 0340 0188      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0162      |                   | 3.7  |   |
|                    | 30 0340 0041      | SWB               | 3.7  |   |
|                    | 30 0340 0026      | Direct Load TDOP  | 3.7  |   |
| AE 116E<br>AE 216E | 30 0340 0148      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 30 0340 0122      |                   | 3.7  |   |
|                    | 30 0340 0188      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0162      |                   | 3.7  |   |
|                    | 30 0340 0034      | SWB               | 3.7  | Maximum of 1 filtered plastic bag layer, which is a liner bag |
|                    | 30 0340 0019      | Direct Load TDOP  | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| AE 116F<br>AE 216F | 30 0340 0327      | Drum              | 1.9  | Maximum of 2 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0302      |                   | 3.7  |  |
|                    | 30 0340 0367      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0341      |                   | 3.7  |  |
| AE 116G<br>AE 216G | 30 0340 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0481      |                   | 3.7  |  |
|                    | 30 0340 0546      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0521      |                   | 3.7  |  |
| AE 116H<br>AE 216H | 30 0340 0686      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0660      |                   | 3.7  |  |
|                    | 30 0340 0725      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0700      |                   | 3.7  |  |
| AE 116I<br>AE 216I | 30 0340 0865      | Drum              | 1.9  | Maximum of 5 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0839      |                   | 3.7  |  |
|                    | 30 0340 0905      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0879      |                   | 3.7  |  |
| AE 116J<br>AE 216J | 30 0340 1044      | Drum              | 1.9  | Maximum of 6 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 1018      |                   | 3.7  |  |
|                    | 30 0340 1084      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 1058      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement                                 |
|--------------------|-------------------|-------------------|---|---|
| AE 129A<br>AE 229A | 40 9999 0127      | Drum              | 1.9   | No layers of confinement                              |
|                    | 40 9999 0101      |                   | 3.7   |   |
|                    | 40 9999 0166      | SWB Overpack      | 1.9   |   |
|                    | 40 9999 0141      |                   | 3.7   |   |
|                    | 40 9999 0028      | SWB               | 3.7   |   |
|                    | 40 9999 0013      | Direct Load TDOP  | 3.7   |   |
| AE 129B<br>AE 229B | 40 9999 0306      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag |
|                    | 40 9999 0280      |                   | 3.7   |   |
|                    | 40 9999 0346      | SWB Overpack      | 1.9   |   |
|                    | 40 9999 0320      |                   | 3.7   |   |
|                    | 40 9999 0208      | SWB               | 3.7   |   |
|                    | 40 9999 0193      | Direct Load TDOP  | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| AW 111A<br>AW 211A | 10 0160 0408      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag          |
|                    | 10 0160 0373      |                   | 3.7   |   |
|                    | 10 0160 0469      | SWB Overpack      | 1.9   |   |
|                    | 10 0160 0433      |                   | 3.7   |   |
|                    | 10 0160 0286      | SWB               | 3.7   |   |
| AW 121A<br>AW 221A | 30 0340 0143      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0117      |                   | 3.7   |   |
|                    | 30 0340 0043      | SWB               | 3.7   |   |
| AW 121B<br>AW 221B | 30 0340 0133      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a liner bag         |
|                    | 30 0340 0108      |                   | 3.7   |   |
|                    | 30 0340 0034      | SWB               | 3.7   |   |
| AW 121C<br>AW 221C | 30 0340 0327      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag          |
|                    | 30 0340 0302      |                   | 3.7   |   |
|                    | 30 0340 0367      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0341      |                   | 3.7   |   |
|                    | 30 0340 0220      | SWB               | 3.7   |   |
| AW 122A<br>AW 222A | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement                           |
|                    | 20 0000 0000      |                   | 3.7   |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |   |
|                    | 20 0000 0000      |                   | 3.7   |   |
|                    | 20 0000 0000      | SWB               | 3.7   |   |
|                    | 20 0000 0000      | Pipe Overpack     | 1.9   |   |
|                    | 20 0000 0000      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| AW 122B<br>AW 222B   | 20 0170 0143      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
|                      | 20 0170 0117      |                   | 3.7   |  |
|                      | 20 0170 0043      | SWB               | 3.7   |  |
| AW 122C<br>AW 222C   | 20 0170 0133      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a liner bag  |
|                      | 20 0170 0108      |                   | 3.7   |  |
|                      | 20 0170 0034      | SWB               | 3.7   |  |
| AW 122D<br>AW 222D   | 20 0170 0327      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag   |
|                      | 20 0170 0302      |                   | 3.7   |  |
|                      | 20 0170 0367      | SWB Overpack      | 1.9   |  |
|                      | 20 0170 0341      |                   | 3.7   |  |
|                      | 20 0170 0220      | SWB               | 3.7   |  |
| AW 125A<br>AW 225A   | 30 0340 0354      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0329      |                   | 3.7   |  |
|                      | 30 0340 0394      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0368      |                   | 3.7   |  |
| AW 125AF<br>AW 225AF | 30 0340 0380      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag, and 1 filtered metal can   |
|                      | 30 0340 0354      |                   | 3.7   |  |
|                      | 30 0340 0420      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0394      |                   | 3.7   |  |
| AW 125B<br>AW 225B   | 30 0340 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0481      |                   | 3.7   |  |
|                      | 30 0340 0546      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0521      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| AW 127A<br>AW 227A | 30 0340 0327      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0302      |                   | 3.7   |  |
|                    | 30 0340 0367      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0341      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-----------------------------|---|--|
| ID 111A<br>ID 211A   | 10 0130 0190      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, both of which are drum liner bags   |
|                      | 10 0130 0154      |                             | 3.7   |  |
|                      | 10 0130 0250      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                      | 10 0130 0215      |                             | 3.7   |  |
|                      | 10 0130 0076      | SWB                         | 3.7   |  |
| ID 111B<br>ID 211B   | 10 0130 0669      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 10 0130 0634      |                             | 3.7   |  |
|                      | 10 0130 0730      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                      | 10 0130 0695      |                             | 3.7   |  |
| ID 111C<br>ID 211C   | 10 0130 0151      | SWB                         | 3.7   | Maximum of 2 plastic bag layers, both of which are liner bags, in a 55-gallon container fitted with a filter with a minimum hydrogen diffusivity value of 1.9 x 10 <sup>-6</sup> mol/s/mol fraction and lined with a rigid liner |
|                      | 10 0130 0132      | Direct Load TDOP            | 3.7   |  |
| ID 111D<br>ID 211D   | 10 0130 0168      | Drum                        | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag.  |
|                      | 10 0130 0133      |                             | 3.7   |  |
|                      | 10 0130 0229      | SWB/85-Gallon Overpack      | 1.9   |  |
|                      | 10 0130 0193      |                             | 3.7   |  |
|                      | 10 0130 0046      | SWB                         | 3.7   |  |
|                      | 10 0130 0027      | Direct Load TDOP            | 3.7   |  |
| ID 111MA<br>ID 211MA | 10 0160 0168      | Drum                        | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag   |
|                      | 10 0160 0133      |                             | 3.7   |  |
|                      | 10 0160 0229      | SWB/85-Gallon Overpack      | 1.9   |  |
|                      | 10 0160 0193      |                             | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-----------------------------|--|---|
| ID 111MB<br>ID 211MB | 10 0130 0147      | Drum                        | 1.9  | No layers of confinement                                      |
|                      | 10 0130 0111      |                             | 3.7  |   |
|                      | 10 0130 0207      | SWB/85-Gallon Overpack      | 1.9  |   |
|                      | 10 0130 0172      |                             | 3.7  |   |
|                      | 10 0130 0046      | SWB                         | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag          |
|                      | 10 0130 0027      | Direct Load TDOP            | 3.7  |   |
| ID 111MC<br>ID 211MC | 10 0160 0408      | Drum                        | 1.9  | Maximum of 2 plastic bag layers, one of which is a liner bag. |
|                      | 10 0160 0373      |                             | 3.7  |   |
|                      | 10 0160 0469      | SWB/85-Gallon Overpack      | 1.9  |   |
|                      | 10 0160 0433      |                             | 3.7  |   |
| ID 111MD<br>ID 211MD | 10 0160 0046      | SWB                         | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag          |
|                      | 10 0160 0027      | Direct Load TDOP            | 3.7  |   |
| ID 112A<br>ID 212A   | 40 9999 0169      | Drum                        | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags |
|                      | 40 9999 0144      |                             | 3.7  |   |
|                      | 40 9999 0209      | SWB/85-Gallon Drum Overpack | 1.9  |   |
|                      | 40 9999 0184      |                             | 3.7  |   |
|                      | 40 9999 0071      | SWB                         | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|------------------------|-------------------|-----------------------------|---|---|
| ID 113A<br>ID 213A     | 40 9999 0169      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags     |
|                        | 40 9999 0144      |                             | 3.7   |   |
|                        | 40 9999 0209      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                        | 40 9999 0184      |                             | 3.7   |   |
|                        | 40 9999 0071      | SWB                         | 3.7   |   |
| ID 114A<br>ID 214A     | 10 0040 0669      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags      |
|                        | 10 0040 0634      |                             | 3.7   |   |
|                        | 10 0040 0730      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                        | 10 0040 0695      |                             | 3.7   |   |
|                        | 10 0040 0556      | SWB                         | 3.7   |   |
| ID 114MA<br>ID 214MA   | 10 0040 0147      | Drum                        | 3.7   | No layers of confinement. Filtered inner lid on double-lid drums. |
|                        | 10 0040 0207      | SWB/85-Gallon Drum Overpack | 3.7   |   |
| ID 114MCD<br>ID 214MCD | 10 0040 0103      | 100-Gallon Drum             | 3.7   | No layers of confinement. Filtered inner lid on double-lid drums. |
| ID 115A<br>ID 215A     | 20 0170 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags      |
|                        | 20 0170 0502      |                             | 3.7   |   |
|                        | 20 0170 0568      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                        | 20 0170 0542      |                             | 3.7   |   |
|                        | 20 0170 0430      | SWB                         | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-----------------------------|---|---|
| ID 116A<br>ID 216A | 30 0340 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0502      |                             | 3.7   |   |
|                    | 30 0340 0568      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 30 0340 0542      |                             | 3.7   |   |
|                    | 30 0340 0430      | SWB                         | 3.7   |   |
| ID 116B<br>ID 216B | 30 0340 0169      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags |
|                    | 30 0340 0144      |                             | 3.7   |   |
|                    | 30 0340 0209      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 30 0340 0184      |                             | 3.7   |   |
|                    | 30 0340 0071      | SWB                         | 3.7   |   |
| ID 116C<br>ID 216C | 30 0340 0707      | Drum                        | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0681      |                             | 3.7   |   |
|                    | 30 0340 0747      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 30 0340 0721      |                             | 3.7   |   |
|                    | 30 0340 0609      | SWB                         | 3.7   |   |
| ID 116D<br>ID 216D | 30 0340 0041      | SWB                         | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag          |
| ID 117A<br>ID 217A | 20 0170 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                    | 20 0170 0502      |                             | 3.7   |   |
|                    | 20 0170 0568      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 20 0170 0542      |                             | 3.7   |   |
|                    | 20 0170 0430      | SWB                         | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-----------------------------|---|---|
| ID 117B<br>ID 217B | 20 0170 0169      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags |
|                    | 20 0170 0144      |                             | 3.7   |   |
|                    | 20 0170 0209      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 20 0170 0184      |                             | 3.7   |   |
|                    | 20 0170 0053      | SWB                         | 3.7   |   |
|                    | 20 0170 0067      | Bin Overpack                | 3.7   |   |
| ID 117C<br>ID 217C | 20 0170 0707      | Drum                        | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags  |
|                    | 20 0170 0681      |                             | 3.7   |   |
|                    | 20 0170 0747      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 20 0170 0721      |                             | 3.7   |   |
|                    | 20 0170 0609      | SWB                         | 3.7   |   |
| ID 117D<br>ID 217D | 20 0000 0000      | Drum                        | 1.9   | Metal can as innermost layer of confinement                   |
|                    | 20 0000 0000      |                             | 3.7   |   |
|                    | 20 0000 0000      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 20 0000 0000      |                             | 3.7   |   |
| ID 117E<br>ID 217E | 20 0170 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                    | 20 0170 0502      |                             | 3.7   |   |
|                    | 20 0170 0568      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 20 0170 0542      |                             | 3.7   |   |
|                    | 20 0170 0430      | SWB                         | 3.7   |   |
| ID 117F<br>ID 217F | 20 0170 0053      | SWB                         | 3.7   | Maximum of 2 plastic bag layers, both of which are liner bags |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-----------------------------|---|--|
| ID 118A<br>ID 218A | 20 0170 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags       |
|                    | 20 0170 0502      |                             | 3.7   |  |
|                    | 20 0170 0568      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 20 0170 0542      |                             | 3.7   |  |
|                    | 20 0170 0430      | SWB                         | 3.7   |  |
| ID 118B<br>ID 218B | 20 0170 0169      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, both of which are drum liner bags |
|                    | 20 0170 0144      |                             | 3.7   |  |
|                    | 20 0170 0209      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 20 0170 0184      |                             | 3.7   |  |
|                    | 20 0170 0071      | SWB                         | 3.7   |  |
|                    | 20 0170 0085      | Bin Overpack                | 3.7   |  |
| ID 118C<br>ID 218C | 20 0170 0707      | Drum                        | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags       |
|                    | 20 0170 0681      |                             | 3.7   |  |
|                    | 20 0170 0747      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 20 0170 0721      |                             | 3.7   |  |
|                    | 20 0170 0609      | SWB                         | 3.7   |  |
| ID 118D<br>ID 218D | 20 0170 0886      | Drum                        | 1.9   | Maximum of 6 plastic bag layers, two of which are liner bags       |
|                    | 20 0170 0861      |                             | 3.7   |  |
|                    | 20 0170 0926      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 20 0170 0900      |                             | 3.7   |  |
|                    | 20 0170 0788      | SWB                         | 3.7   |  |
| ID 118E<br>ID 218E | 20 0170 0041      | SWB                         | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag               |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-----------------------------|---|---|
| ID 119A<br>ID 219A   | 30 0340 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                      | 30 0340 0502      |                             | 3.7   |   |
|                      | 30 0340 0568      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                      | 30 0340 0542      |                             | 3.7   |   |
|                      | 30 0340 0430      | SWB                         | 3.7   |   |
| ID 119B<br>ID 219B   | 30 0340 0399      | SWB                         | 3.7   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
| ID 119C<br>ID 219C   | 30 0340 0484      | SWB                         | 3.7   | Maximum of 4 plastic bag layers, 2 of which are liner bags, in a 55-gallon container fitted with a filter with a minimum hydrogen diffusivity value of 1.9 x 10 <sup>-6</sup> mol/s/mol fraction and lined with a rigid liner |
| ID 121A<br>ID 221A   | 30 0340 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                      | 30 0340 0502      |                             | 3.7   |   |
|                      | 30 0340 0568      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                      | 30 0340 0542      |                             | 3.7   |   |
|                      | 30 0340 0430      | SWB                         | 3.7   |   |
| ID 121B<br>ID 221B   | 30 0340 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                      | 30 0340 0502      |                             | 3.7   |   |
|                      | 30 0340 0568      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                      | 30 0340 0542      |                             | 3.7   |   |
|                      | 30 0340 0430      | SWB                         | 3.7   |   |
| ID 121C<br>ID 221C   | 30 0340 0041      | SWB                         | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag  |
| ID 121CD<br>ID 221CD | 30 0340 0082      | 100-Gallon Drum             | 3.7   | No layers of confinement. Filtered inner lid on double-lid drums.   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-----------------------------|---|---|
| ID 122A<br>ID 222A   | 20 0170 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags      |
|                      | 20 0170 0502      |                             | 3.7   |   |
|                      | 20 0170 0568      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                      | 20 0170 0542      |                             | 3.7   |   |
|                      | 20 0170 0430      | SWB                         | 3.7   |   |
| ID 122B<br>ID 222B   | 20 0170 0865      | Drum                        | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag      |
|                      | 20 0170 0839      |                             | 3.7   |   |
|                      | 20 0170 0905      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                      | 20 0170 0879      |                             | 3.7   |   |
|                      | 20 0170 0767      | SWB                         | 3.7   |   |
| ID 122C<br>ID 222C   | 20 0000 0000      | Drum                        | 1.9   | Metal can as innermost layer of confinement                       |
|                      | 20 0000 0000      |                             | 3.7   |   |
|                      | 20 0000 0000      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                      | 20 0000 0000      |                             | 3.7   |   |
|                      | 20 0000 0000      | SWB                         | 3.7   |   |
| ID 122CD<br>ID 222CD | 20 0170 0082      | 100-Gallon Drum             | 3.7   | No layers of confinement. Filtered inner lid on double-lid drums. |
| ID 122D<br>ID 222D   | 20 0170 0041      | SWB                         | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag              |
| ID 122IA<br>ID 222IA | 20 0000 0000      | Drum                        | 3.7   | No layers of confinement and no rigid liner                       |
|                      | 20 0000 0000      | SWB/85-Gallon Drum Overpack | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-----------------------------|---|--|
| ID 123A<br>ID 223A | 30 0340 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0502      |                             | 3.7   |  |
|                    | 30 0340 0568      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 30 0340 0542      |                             | 3.7   |  |
|                    | 30 0340 0430      | SWB                         | 3.7   |  |
| ID 124A<br>ID 224A | 20 0000 0000      | Drum                        | 1.9   | Metal can as innermost layer of confinement                  |
|                    | 20 0000 0000      |                             | 3.7   |  |
|                    | 20 0000 0000      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 20 0000 0000      |                             | 3.7   |  |
|                    | 20 0000 0000      | SWB                         | 3.7   |  |
| ID 125A<br>ID 225A | 30 0340 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0502      |                             | 3.7   |  |
|                    | 30 0340 0568      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 30 0340 0542      |                             | 3.7   |  |
|                    | 30 0340 0430      | SWB                         | 3.7   |  |
| ID 125B<br>ID 225B | 30 0340 0707      | Drum                        | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0681      |                             | 3.7   |  |
|                    | 30 0340 0747      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 30 0340 0721      |                             | 3.7   |  |
|                    | 30 0340 0609      | SWB                         | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-----------------------------|---|--|
| ID 125C<br>ID 225C | 30 0340 0707      | Drum                        | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0681      |                             | 3.7   |  |
|                    | 30 0340 0747      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 30 0340 0721      |                             | 3.7   |  |
|                    | 30 0340 0609      | SWB                         | 3.7   |  |
| ID 125D<br>ID 225D | 30 0340 0886      | Drum                        | 1.9   | Maximum of 6 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0861      |                             | 3.7   |  |
|                    | 30 0340 0926      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 30 0340 0900      |                             | 3.7   |  |
|                    | 30 0340 0788      | SWB                         | 3.7   |  |
| ID 125E<br>ID 225E | 30 0340 0865      | Drum                        | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0839      |                             | 3.7   |  |
|                    | 30 0340 0905      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 30 0340 0879      |                             | 3.7   |  |
|                    | 30 0340 0767      | SWB                         | 3.7   |  |
| ID 126A<br>ID 226A | 30 0340 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0502      |                             | 3.7   |  |
|                    | 30 0340 0568      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                    | 30 0340 0542      |                             | 3.7   |  |
|                    | 30 0340 0430      | SWB                         | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|------------------------|-------------------|-----------------------------|---|---|
| ID 126B<br>ID 226B     | 30 0340 0528      | Drum                        | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags      |
|                        | 30 0340 0502      |                             | 3.7   |   |
|                        | 30 0340 0568      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                        | 30 0340 0542      |                             | 3.7   |   |
|                        | 30 0340 0430      | SWB                         | 3.7   |   |
| ID 126MCD<br>ID 226MCD | 30 0340 0082      | 100-Gallon Drum             | 3.7   | No layers of confinement. Filtered inner lid on double-lid drums. |
| ID 127A<br>ID 227A     | 30 0340 0067      | Bin Overpack                | 3.7   | Maximum of 2 plastic bag layers, both of which are liner bags     |
| ID 130CD<br>ID 230CD   | 30 0185 0082      | 100-Gallon Drum             | 3.7   | No layers of confinement. Filtered inner lid on double-lid drums. |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 111A<br>LA 211A | 10 0130 0168      | Drum              | 1.9   | Maximum of one plastic bag layer, which is a liner bag  |
|                    | 10 0130 0133      |                   | 3.7   |   |
|                    | 10 0130 0103      |                   | 18.5  |   |
|                    | 10 0130 0229      | SWB Overpack      | 1.9   |   |
|                    | 10 0130 0193      |                   | 3.7   |   |
|                    | 10 0130 0163      |                   | 18.5  |   |
| LA 111B<br>LA 211B | 10 0130 0147      | Drum              | 1.9   | No layers of confinement  |
|                    | 10 0130 0111      |                   | 3.7   |   |
|                    | 10 0130 0081      |                   | 18.5  |   |
|                    | 10 0130 0207      | SWB Overpack      | 1.9   |   |
|                    | 10 0130 0172      |                   | 3.7   |   |
|                    | 10 0130 0142      |                   | 18.5  |   |
|                    | 10 0130 0034      | SWB               | 3.7   |   |
| LA 111G<br>LA 211G | 10 0130 0091      | SWB (2 filters)   | 3.7   | Maximum of 3 plastic bag layers, two of which are drum liner bags, and one of which is an SWB liner bag |
|                    | 10 0130 0082      | SWB (4 filters)   | 3.7   |   |
| LA 111H<br>LA 211H | 10 0130 0082      | SWB (2 filters)   | 3.7   | Maximum of 3 plastic bag layers, one of which is a drum liner bag, and two of which are SWB liner bags  |
|                    | 10 0130 0073      | SWB (4 filters)   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| LA 112A<br>LA 212A | 40 9999 0485      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags |
|                    | 40 9999 0459      |                   | 3.7  |   |
|                    | 40 9999 0438      |                   | 18.5   |   |
|                    | 40 9999 0525      | SWB Overpack      | 1.9  |   |
|                    | 40 9999 0499      |                   | 3.7  |   |
|                    | 40 9999 0434      |                   | 18.5 <sup>b</sup>  |   |
| LA 114A<br>LA 214A | 10 0040 0190      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags |
|                    | 10 0040 0154      |                   | 3.7  |   |
|                    | 10 0040 0124      |                   | 18.5   |   |
|                    | 10 0040 0250      | SWB Overpack      | 1.9  |   |
|                    | 10 0040 0215      |                   | 3.7  |   |
|                    | 10 0040 0125      |                   | 18.5 <sup>b</sup>  |   |
| LA 114B<br>LA 214B | 10 0040 0168      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 10 0040 0133      |                   | 3.7  |   |
|                    | 10 0040 0103      |                   | 18.5   |   |
|                    | 10 0040 0229      | SWB Overpack      | 1.9  |   |
|                    | 10 0040 0193      |                   | 3.7  |   |
|                    | 10 0040 0104      |                   | 18.5 <sup>b</sup>  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 114C<br>LA 214C | 10 0040 0147      | Drum              | 1.9   | No layers of confinement  |
|                    | 10 0040 0111      |                   | 3.7   |   |
|                    | 10 0040 0081      |                   | 18.5  |   |
|                    | 10 0040 0207      | SWB Overpack      | 1.9   |   |
|                    | 10 0040 0172      |                   | 3.7   |   |
|                    | 10 0040 0082      |                   | 18.5 <sup>b</sup>   |   |
| LA 114E<br>LA 214E | 10 0040 0389      | Pipe Overpack     | 3.7   | Waste is placed into a slip-top metal can. Can is placed into a maximum of one plastic bag layer, which is an inner bag. Bag is placed into a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/ mol fraction |
| LA 115A<br>LA 215A | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement   |
|                    | 20 0000 0000      |                   | 3.7   |   |
|                    | 20 0000 0000      |                   | 18.5  |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |   |
|                    | 20 0000 0000      |                   | 3.7   |   |
|                    | 20 0000 0000      |                   | 18.5 <sup>b</sup>   |   |
| LA 115B<br>LA 215B | 20 0170 0110      | Drum              | 3.7   | Maximum of 1 filtered plastic bag layer, which is an inner bag  |
|                    | 20 0170 0089      |                   | 18.5  |   |
|                    | 20 0170 0150      | SWB Overpack      | 3.7   |   |
|                    | 20 0170 0085      |                   | 18.5 <sup>b</sup>   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 116A<br>LA 216A | 30 0340 0528      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags           |
|                    | 30 0340 0502      |                   | 3.7   |  |
|                    | 30 0340 0481      |                   | 18.5  |  |
|                    | 30 0340 0568      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0542      |                   | 3.7   |  |
|                    | 30 0340 0477      |                   | 18.5 <sup>b</sup>   |  |
| LA 116B<br>LA 216B | 30 0340 0145      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags |
|                    | 30 0340 0120      |                   | 3.7   |  |
|                    | 30 0340 0098      |                   | 18.5  |  |
| LA 116C<br>LA 216C | 30 0340 0306      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag                  |
|                    | 30 0340 0280      |                   | 3.7   |  |
|                    | 30 0340 0259      |                   | 18.5  |  |
|                    | 30 0340 0346      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0320      |                   | 3.7   |  |
|                    | 30 0340 0255      |                   | 18.5 <sup>b</sup>   |  |
|                    | 30 0340 0208      | SWB               | 3.7   |  |
|                    | 30 0340 0197      |                   | 18.5  |  |
|                    | 30 0340 0193      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0190      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 116D<br>LA 216D | 30 0340 0485      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags      |
|                    | 30 0340 0459      |                   | 3.7   |  |
|                    | 30 0340 0438      |                   | 18.5  |  |
|                    | 30 0340 0525      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0499      |                   | 3.7   |  |
|                    | 30 0340 0434      |                   | 18.5 <sup>b</sup>   |  |
| LA 116E<br>LA 216E | 30 0340 0136      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag     |
|                    | 30 0340 0110      |                   | 3.7   |  |
|                    | 30 0340 0089      |                   | 18.5  |  |
|                    | 30 0340 0038      | SWB               | 3.7   |  |
|                    | 30 0340 0027      |                   | 18.5  |  |
|                    | 30 0340 0023      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0020      |                   | 18.5  |  |
| LA 116F<br>LA 216F | 30 0340 0133      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a drum liner bag |
|                    | 30 0340 0108      |                   | 3.7   |  |
|                    | 30 0340 0086      |                   | 18.5  |  |
|                    | 30 0340 0035      | SWB               | 3.7   |  |
|                    | 30 0340 0024      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 116G<br>LA 216G | 30 0340 0127      | Drum              | 1.9   | No layers of confinement                                     |
|                    | 30 0340 0101      |                   | 3.7   |  |
|                    | 30 0340 0079      |                   | 18.5  |  |
|                    | 30 0340 0166      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0141      |                   | 3.7   |  |
|                    | 30 0340 0076      |                   | 18.5 <sup>b</sup>   |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |
|                    | 30 0340 0018      |                   | 18.5  |  |
|                    | 30 0340 0013      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0011      |                   | 18.5  |  |
| LA 116H<br>LA 216H | 30 0340 0707      | Drum              | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0681      |                   | 3.7   |  |
|                    | 30 0340 0660      |                   | 18.5  |  |
|                    | 30 0340 0747      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0721      |                   | 3.7   |  |
|                    | 30 0340 0656      |                   | 18.5 <sup>b</sup>   |  |
| LA 116I<br>LA 216I | 30 0340 0861      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0839      |                   | 18.5  |  |
|                    | 30 0340 0900      | SWB Overpack      | 3.7   |  |
|                    | 30 0340 0836      |                   | 18.5 <sup>b</sup>   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 116J<br>LA 216J | 30 0340 0486      | Pipe Overpack     | 3.7   | Maximum of 2 plastic bag layers, which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| LA 117A<br>LA 217A | 20 0170 0745      | SWB               | 3.7   | Maximum of 4 plastic bag layers, which are inner bags   |
|                    | 20 0170 0734      |                   | 18.5  |   |
| LA 117B<br>LA 217B | 20 0170 0306      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag   |
|                    | 20 0170 0280      |                   | 3.7   |   |
|                    | 20 0170 0259      |                   | 18.5  |   |
|                    | 20 0170 0346      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0320      |                   | 3.7   |   |
|                    | 20 0170 0255      |                   | 18.5 <sup>b</sup>   |   |
|                    | 20 0170 0208      | SWB               | 3.7   |   |
|                    | 20 0170 0197      |                   | 18.5  |   |
|                    | 20 0170 0193      | Direct Load TDOP  | 3.7   |   |
|                    | 20 0170 0190      |                   | 18.5  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 117C<br>LA 217C | 20 0170 0136      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 20 0170 0110      |                   | 3.7   |  |
|                    | 20 0170 0089      |                   | 18.5  |  |
|                    | 20 0170 0038      | SWB               | 3.7   |  |
|                    | 20 0170 0027      |                   | 18.5  |  |
|                    | 20 0170 0023      | Direct Load TDOP  | 3.7   |  |
|                    | 20 0170 0020      |                   | 18.5  |  |
| LA 117D<br>LA 217D | 20 0170 0485      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags  |
|                    | 20 0170 0459      |                   | 3.7   |  |
|                    | 20 0170 0438      |                   | 18.5  |  |
|                    | 20 0170 0525      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0499      |                   | 3.7   |  |
|                    | 20 0170 0434      |                   | 18.5 <sup>b</sup>   |  |
|                    |                   |                   |   |  |
| LA 117E<br>LA 217E | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement                    |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      |                   | 18.5  |  |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      |                   | 18.5 <sup>b</sup>   |  |
|                    |                   |                   |   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 117F<br>LA 217F | 20 0170 0133      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a drum liner bag |
|                    | 20 0170 0108      |                   | 3.7   |  |
|                    | 20 0170 0086      |                   | 18.5  |  |
|                    | 20 0170 0035      | SWB               | 3.7   |  |
|                    | 20 0170 0024      |                   | 18.5  |  |
| LA 117G<br>LA 217G | 20 0170 0127      | Drum              | 1.9   | No layers of confinement   |
|                    | 20 0170 0101      |                   | 3.7   |  |
|                    | 20 0170 0079      |                   | 18.5  |  |
|                    | 20 0170 0166      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0141      |                   | 3.7   |  |
|                    | 20 0170 0076      |                   | 18.5 <sup>b</sup>   |  |
|                    | 20 0170 0028      | SWB               | 3.7   |  |
|                    | 20 0170 0018      |                   | 18.5  |  |
|                    | 20 0170 0013      | Direct Load TDOP  | 3.7   |  |
|                    | 20 0170 0011      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 117H<br>LA 217H | 20 0170 0707      | Drum              | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 20 0170 0681      |                   | 3.7   |  |
|                    | 20 0170 0660      |                   | 18.5  |  |
|                    | 20 0170 0747      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0721      |                   | 3.7   |  |
|                    | 20 0170 0656      |                   | 18.5 <sup>b</sup>   |  |
| LA 117I<br>LA 217I | 20 0170 0502      | Drum              | 3.7   | Maximum of 4 plastic bag layers, two of which are liner bags |
|                    | 20 0170 0481      |                   | 18.5  |  |
|                    | 20 0170 0542      | SWB Overpack      | 3.7   |  |
|                    | 20 0170 0477      |                   | 18.5 <sup>b</sup>   |  |
|                    | 20 0170 0412      | SWB               | 3.7   |  |
|                    | 20 0170 0401      |                   | 18.5  |  |
| LA 117J<br>LA 217J | 20 0170 0861      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags |
|                    | 20 0170 0839      |                   | 18.5  |  |
|                    | 20 0170 0900      | SWB Overpack      | 3.7   |  |
|                    | 20 0170 0836      |                   | 18.5 <sup>b</sup>   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| LA 118A<br>LA 218A | 20 0000 0000      | Drum              | 1.9  | Metal can as innermost layer of confinement                   |
|                    | 20 0000 0000      |                   | 3.7  |   |
|                    | 20 0000 0000      |                   | 18.5   |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9  |   |
|                    | 20 0000 0000      |                   | 3.7  |   |
|                    | 20 0000 0000      |                   | 18.5 <sup>b</sup>  |   |
| LA 118B<br>LA 218B | 20 0170 0306      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is an inner bag         |
|                    | 20 0170 0280      |                   | 3.7  |   |
|                    | 20 0170 0259      |                   | 18.5   |   |
|                    | 20 0170 0346      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0320      |                   | 3.7  |   |
|                    | 20 0170 0255      |                   | 18.5 <sup>b</sup>  |   |
|                    | 20 0170 0208      | SWB               | 3.7  |   |
|                    | 20 0170 0197      |                   | 18.5   |   |
|                    | 20 0170 0193      | Direct Load TDOP  | 3.7  |   |
|                    | 20 0170 0190      |                   | 18.5   |   |
| LA 118C<br>LA 218C | 20 0170 0133      | Drum              | 1.9  | Maximum of 1 filtered plastic bag layer, which is a liner bag |
|                    | 20 0170 0108      |                   | 3.7  |   |
|                    | 20 0170 0086      |                   | 18.5   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| LA 118D<br>LA 218D | 20 0170 0127      | Drum              | 1.9  | No layers of confinement                                     |
|                    | 20 0170 0101      |                   | 3.7  |  |
|                    | 20 0170 0079      |                   | 18.5   |  |
|                    | 20 0170 0166      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0141      |                   | 3.7  |  |
|                    | 20 0170 0076      |                   | 18.5 <sup>b</sup>  |  |
|                    | 20 0170 0028      | SWB               | 3.7  |  |
|                    | 20 0170 0018      |                   | 18.5   |  |
|                    | 20 0170 0013      | Direct Load TDOP  | 3.7  |  |
|                    | 20 0170 0011      |                   | 18.5   |  |
| LA 118E<br>LA 218E | 20 0170 0707      | Drum              | 1.9  | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 20 0170 0681      |                   | 3.7  |  |
|                    | 20 0170 0660      |                   | 18.5   |  |
|                    | 20 0170 0747      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0721      |                   | 3.7  |  |
|                    | 20 0170 0656      |                   | 18.5 <sup>b</sup>  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 118F<br>LA 218F | 20 0170 0134      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag, and no rigid liner in the 55-gallon drums |
|                    | 20 0170 0108      |                   | 3.7   |   |
|                    | 20 0170 0087      |                   | 18.5  |   |
|                    | 20 0170 0174      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0148      |                   | 3.7   |   |
|                    | 20 0170 0083      |                   | 18.5 <sup>b</sup>   |   |
| LA 118G<br>LA 218G | 20 0170 0861      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags  |
|                    | 20 0170 0839      |                   | 18.5  |   |
|                    | 20 0170 0900      | SWB Overpack      | 3.7   |   |
|                    | 20 0170 0836      |                   | 18.5 <sup>b</sup>   |   |
| LA 119A<br>LA 219A | 30 0340 0306      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag   |
|                    | 30 0340 0280      |                   | 3.7   |   |
|                    | 30 0340 0259      |                   | 18.5  |   |
|                    | 30 0340 0346      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0320      |                   | 3.7   |   |
|                    | 30 0340 0255      |                   | 18.5 <sup>b</sup>   |   |
|                    | 30 0340 0208      | SWB               | 3.7   |   |
|                    | 30 0340 0197      |                   | 18.5  |   |
|                    | 30 0340 0193      | Direct Load TDOP  | 3.7   |   |
|                    | 30 0340 0190      |                   | 18.5  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 119B<br>LA 219B | 30 0340 0136      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag     |
|                    | 30 0340 0110      |                   | 3.7   |  |
|                    | 30 0340 0089      |                   | 18.5  |  |
|                    | 30 0340 0038      | SWB               | 3.7   |  |
|                    | 30 0340 0027      |                   | 18.5  |  |
|                    | 30 0340 0023      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0020      |                   | 18.5  |  |
| LA 119C<br>LA 219C | 30 0340 0133      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a drum liner bag |
|                    | 30 0340 0108      |                   | 3.7   |  |
|                    | 30 0340 0086      |                   | 18.5  |  |
|                    | 30 0340 0035      | SWB               | 3.7   |  |
|                    | 30 0340 0024      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 119D<br>LA 219D | 30 0340 0127      | Drum              | 1.9   | No layers of confinement                                     |
|                    | 30 0340 0101      |                   | 3.7   |  |
|                    | 30 0340 0079      |                   | 18.5  |  |
|                    | 30 0340 0166      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0141      |                   | 3.7   |  |
|                    | 30 0340 0076      |                   | 18.5 <sup>b</sup>   |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |
|                    | 30 0340 0018      |                   | 18.5  |  |
|                    | 30 0340 0013      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0011      |                   | 18.5  |  |
| LA 119E<br>LA 219E | 30 0340 0707      | Drum              | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0681      |                   | 3.7   |  |
|                    | 30 0340 0660      |                   | 18.5  |  |
|                    | 30 0340 0747      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0721      |                   | 3.7   |  |
|                    | 30 0340 0656      |                   | 18.5 <sup>b</sup>   |  |
| LA 119F<br>LA 219F | 30 0340 0861      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0839      |                   | 18.5  |  |
|                    | 30 0340 0900      | SWB Overpack      | 3.7   |  |
|                    | 30 0340 0836      |                   | 18.5 <sup>b</sup>   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category            | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|------------------------------|-------------------|--|--|
| LA 120A<br>LA 220A | 20 0000 0000<br>20 0000 0000 | Pipe<br>Overpack  | 1.9<br>3.7   | Metal can as innermost layer of confinement                    |
| LA 122A<br>LA 222A | 20 0000 0000                 | Drum              | 1.9  | Metal can as innermost layer of confinement                    |
|                    | 20 0000 0000                 |                   | 3.7  |  |
|                    | 20 0000 0000                 |                   | 18.5   |  |
|                    | 20 0000 0000                 | SWB Overpack      | 1.9  |  |
|                    | 20 0000 0000                 |                   | 3.7  |  |
|                    | 20 0000 0000                 |                   | 18.5 <sup>b</sup>  |  |
|                    | 20 0000 0000                 | Pipe Overpack     | 1.9  |  |
|                    | 20 0000 0000                 |                   | 3.7  |  |
|                    | 20 0000 0000                 |                   | 18.5   |  |
| LA 122B<br>LA 222B | 20 0170 0136                 | Drum              | 1.9  | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 20 0170 0110                 |                   | 3.7  |  |
|                    | 20 0170 0089                 |                   | 18.5   |  |
|                    | 20 0170 0176                 | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0150                 |                   | 3.7  |  |
|                    | 20 0170 0085                 |                   | 18.5 <sup>b</sup>  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 122C<br>LA 222C | 20 0170 0110      | Drum              | 3.7   | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 20 0170 0089      |                   | 18.5  |  |
|                    | 20 0170 0038      | SWB               | 3.7   |  |
|                    | 20 0170 0027      |                   | 18.5  |  |
|                    | 20 0170 0023      | Direct Load TDOP  | 3.7   |  |
|                    | 20 0170 0020      |                   | 18.5  |  |
| LA 123A<br>LA 223A | 30 0340 0528      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                    | 30 0340 0502      |                   | 3.7   |  |
|                    | 30 0340 0481      |                   | 18.5  |  |
|                    | 30 0340 0568      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0542      |                   | 3.7   |  |
|                    | 30 0340 0477      |                   | 18.5 <sup>b</sup>   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 123B<br>LA 223B | 30 0340 0306      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag                  |
|                    | 30 0340 0280      |                   | 3.7   |  |
|                    | 30 0340 0259      |                   | 18.5  |  |
|                    | 30 0340 0346      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0320      |                   | 3.7   |  |
|                    | 30 0340 0255      |                   | 18.5 <sup>b</sup>   |  |
|                    | 30 0340 0208      | SWB               | 3.7   |  |
|                    | 30 0340 0197      |                   | 18.5  |  |
|                    | 30 0340 0193      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0190      |                   | 18.5  |  |
| LA 123C<br>LA 223C | 30 0340 0136      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag         |
|                    | 30 0340 0110      |                   | 3.7   |  |
|                    | 30 0340 0089      |                   | 18.5  |  |
|                    | 30 0340 0038      | SWB               | 3.7   |  |
|                    | 30 0340 0027      |                   | 18.5  |  |
|                    | 30 0340 0023      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0020      |                   | 18.5  |  |
| LA 123D<br>LA 223D | 30 0340 0145      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags |
|                    | 30 0340 0120      |                   | 3.7   |  |
|                    | 30 0340 0098      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 123E<br>LA 223E | 30 0340 0133      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a liner bag |
|                    | 30 0340 0108      |                   | 3.7   |   |
|                    | 30 0340 0086      |                   | 18.5  |   |
| LA 123F<br>LA 223F | 30 0340 0127      | Drum              | 1.9   | No layers of confinement                                      |
|                    | 30 0340 0101      |                   | 3.7   |   |
|                    | 30 0340 0079      |                   | 18.5  |   |
|                    | 30 0340 0166      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0141      |                   | 3.7   |   |
|                    | 30 0340 0076      |                   | 18.5 <sup>b</sup>   |   |
|                    | 30 0340 0028      | SWB               | 3.7   |   |
|                    | 30 0340 0018      |                   | 18.5  |   |
|                    | 30 0340 0013      | Direct Load TDOP  | 3.7   |   |
|                    | 30 0340 0011      |                   | 18.5  |   |
| LA 123G<br>LA 223G | 30 0340 0707      | Drum              | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0681      |                   | 3.7   |   |
|                    | 30 0340 0660      |                   | 18.5  |   |
|                    | 30 0340 0747      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0721      |                   | 3.7   |   |
|                    | 30 0340 0656      |                   | 18.5 <sup>b</sup>   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 123H<br>LA 223H | 30 0340 0861      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags   |
|                    | 30 0340 0839      |                   | 18.5  |  |
|                    | 30 0340 0900      | SWB Overpack      | 3.7   |  |
|                    | 30 0340 0836      |                   | 18.5 <sup>b</sup>   |  |
| LA 124A<br>LA 224A | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement                    |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      |                   | 18.5  |  |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      |                   | 18.5 <sup>b</sup>   |  |
| LA 124B<br>LA 224B | 20 0170 0110      | Drum              | 3.7   | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 20 0170 0089      |                   | 18.5  |  |
|                    | 20 0170 0038      | SWB               | 3.7   |  |
|                    | 20 0170 0027      |                   | 18.5  |  |
|                    | 20 0170 0023      | Direct Load TDOP  | 3.7   |  |
|                    | 20 0170 0020      |                   | 18.5  |  |
| LA 124C<br>LA 224C | 20 0000 0000      | Pipe Overpack     | 3.7   | Metal can as innermost layer of confinement in a pipe overpack |
| LA 125A<br>LA 225A | 30 0340 0041      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag           |
|                    | 30 0340 0030      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 125B<br>LA 225B | 30 0340 0306      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag          |
|                    | 30 0340 0280      |                   | 3.7   |  |
|                    | 30 0340 0259      |                   | 18.5  |  |
|                    | 30 0340 0346      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0320      |                   | 3.7   |  |
|                    | 30 0340 0255      |                   | 18.5 <sup>b</sup>   |  |
|                    | 30 0340 0208      | SWB               | 3.7   |  |
|                    | 30 0340 0197      |                   | 18.5  |  |
|                    | 30 0340 0193      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0190      |                   | 18.5  |  |
| LA 125C<br>LA 225C | 30 0340 0136      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 30 0340 0110      |                   | 3.7   |  |
|                    | 30 0340 0089      |                   | 18.5  |  |
|                    | 30 0340 0038      | SWB               | 3.7   |  |
|                    | 30 0340 0027      |                   | 18.5  |  |
|                    | 30 0340 0023      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0020      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 125D<br>LA 225D | 30 0340 0133      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a drum liner bag |
|                    | 30 0340 0108      |                   | 3.7   |  |
|                    | 30 0340 0086      |                   | 18.5  |  |
|                    | 30 0340 0035      | SWB               | 3.7   |  |
|                    | 30 0340 0024      |                   | 18.5  |  |
| LA 125E<br>LA 225E | 30 0340 0127      | Drum              | 1.9   | No layers of confinement   |
|                    | 30 0340 0101      |                   | 3.7   |  |
|                    | 30 0340 0079      |                   | 18.5  |  |
|                    | 30 0340 0166      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0141      |                   | 3.7   |  |
|                    | 30 0340 0076      |                   | 18.5 <sup>b</sup>   |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |
|                    | 30 0340 0018      |                   | 18.5  |  |
|                    | 30 0340 0013      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0011      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 125F<br>LA 225F | 30 0340 0707      | Drum              | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0681      |                   | 3.7   |   |
|                    | 30 0340 0660      |                   | 18.5  |   |
|                    | 30 0340 0747      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0721      |                   | 3.7   |   |
|                    | 30 0340 0656      |                   | 18.5 <sup>b</sup>   |   |
| LA 125G<br>LA 225G | 30 0340 0861      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0839      |                   | 18.5  |   |
|                    | 30 0340 0900      | SWB Overpack      | 3.7   |   |
|                    | 30 0340 0836      |                   | 18.5 <sup>b</sup>   |   |
| LA 125H<br>LA 225H | 30 0340 0486      | Pipe Overpack     | 3.7   | Maximum of 2 plastic bag layers, which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| LA 126A<br>LA 226A | 30 0340 0169      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                    | 30 0340 0144      |                   | 3.7   |   |
|                    | 30 0340 0122      |                   | 18.5  |   |
|                    | 30 0340 0209      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0184      |                   | 3.7   |   |
|                    | 30 0340 0119      |                   | 18.5 <sup>b</sup>   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the overpacking SWB).

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement                                |
|--------------------|-------------------|-------------------|---|--|
| LA 126B<br>LA 226B | 30 0340 0148      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag |
|                    | 30 0340 0122      |                   | 3.7   |  |
|                    | 30 0340 0101      |                   | 18.5  |  |
|                    | 30 0340 0188      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0162      |                   | 3.7   |  |
|                    | 30 0340 0097      |                   | 18.5 <sup>b</sup>   |  |
| LA 126C<br>LA 226C | 30 0340 0127      | Drum              | 1.9   | No layers of confinement                             |
|                    | 30 0340 0101      |                   | 3.7   |  |
|                    | 30 0340 0079      |                   | 18.5  |  |
|                    | 30 0340 0166      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0141      |                   | 3.7   |  |
|                    | 30 0340 0076      |                   | 18.5 <sup>b</sup>   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LL 111A<br>LL 211A | 10 0160 0648      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag |
|                    | 10 0160 0613      |                   | 3.7   |  |
|                    | 10 0160 0709      | SWB Overpack      | 1.9   |  |
|                    | 10 0160 0673      |                   | 3.7   |  |
| LL 111B<br>LL 211B | 10 0160 0147      | Drum              | 1.9   | No layers of confinement                                     |
|                    | 10 0160 0111      |                   | 3.7   |  |
| LL 113A<br>LL 213A | 40 9999 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag |
|                    | 40 9999 0481      |                   | 3.7   |  |
|                    | 40 9999 0546      | SWB Overpack      | 1.9   |  |
|                    | 40 9999 0521      |                   | 3.7   |  |
| LL 116A<br>LL 216A | 30 0340 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0481      |                   | 3.7   |  |
|                    | 30 0340 0546      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0521      |                   | 3.7   |  |
| LL 116B<br>LL 216B | 30 0340 0686      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0660      |                   | 3.7   |  |
|                    | 30 0340 0725      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0700      |                   | 3.7   |  |
| LL 116C<br>LL 216C | 30 0340 0865      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0839      |                   | 3.7   |  |
|                    | 30 0340 0905      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0879      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LL 119A<br>LL 219A | 30 0340 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0481      |                   | 3.7   |   |
|                    | 30 0340 0546      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0521      |                   | 3.7   |   |
|                    | 30 0340 0053      | SWB               | 3.7   | Maximum of 2 plastic bag layers, both of which are liner bags |
| LL 124A<br>LL 224A | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement                   |
|                    | 20 0000 0000      |                   | 3.7   |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |   |
|                    | 20 0000 0000      |                   | 3.7   |   |
| LL 124B<br>LL 224B | 20 0170 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0481      |                   | 3.7   |   |
|                    | 20 0170 0546      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0521      |                   | 3.7   |   |
| LL 125A<br>LL 225A | 30 0340 0485      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags |
|                    | 30 0340 0459      |                   | 3.7   |   |
|                    | 30 0340 0387      | SWB               | 3.7   |   |
|                    | 30 0340 0372      | Direct Load TDOP  | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| MD 111A<br>MD 211A | 10 0130 0147      | Drum              | 1.9  | No layers of confinement                                     |
|                    | 10 0130 0111      |                   | 3.7  |  |
|                    | 10 0130 0207      | SWB Overpack      | 1.9  |  |
|                    | 10 0130 0172      |                   | 3.7  |  |
| MD 111B<br>MD 211B | 10 0130 0034      | SWB               | 3.7  | No layers of confinement                                     |
| MD 116A<br>MD 216A | 30 0340 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0481      |                   | 3.7  |  |
|                    | 30 0340 0546      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0521      |                   | 3.7  |  |
| MD 117A<br>MD 217A | 20 0170 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag |
|                    | 20 0170 0481      |                   | 3.7  |  |
|                    | 20 0170 0546      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0521      |                   | 3.7  |  |
|                    | 20 0170 0028      | SWB               | 3.7  | No layers of confinement                                     |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| NT 111A<br>NT 211A | 10 0160 0147      | Drum              | 1.9   | No layers of confinement                                      |
|                    | 10 0160 0111      |                   | 3.7   |   |
|                    | 10 0160 0207      | SWB Overpack      | 1.9   |   |
|                    | 10 0160 0172      |                   | 3.7   |   |
| NT 116A<br>NT 216A | 30 0340 0485      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags |
|                    | 30 0340 0459      |                   | 3.7   |   |
|                    | 30 0340 0525      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0499      |                   | 3.7   |   |
| NT 119A<br>NT 219A | 30 0340 0148      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 30 0340 0122      |                   | 3.7   |   |
|                    | 30 0340 0188      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0162      |                   | 3.7   |   |
| NT 125A<br>NT 225A | 30 0340 0686      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0660      |                   | 3.7   |   |
|                    | 30 0340 0725      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0700      |                   | 3.7   |   |
| NT 125B<br>NT 225B | 30 0340 0148      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 30 0340 0122      |                   | 3.7   |   |
|                    | 30 0340 0188      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0162      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| OR 125A<br>OR 225A | 30 0340 0125      | Drum              | 1.9   | No layers of confinement   |
|                    | 30 0340 0099      |                   | 3.7   |  |
|                    | 30 0340 0164      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0139      |                   | 3.7   |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |
| OR 125B<br>OR 225B | 30 0340 0304      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag, and no rigid liner in the 55-gallon drums                                   |
|                    | 30 0340 0278      |                   | 3.7   |  |
|                    | 30 0340 0344      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0318      |                   | 3.7   |  |
|                    | 30 0340 0208      | SWB               | 3.7   |  |
| OR 125C<br>OR 225C | 30 0340 0131      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a liner bag, and no rigid liner in the 55-gallon drums                           |
|                    | 30 0340 0106      |                   | 3.7   |  |
|                    | 30 0340 0171      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0145      |                   | 3.7   |  |
|                    | 30 0340 0034      | SWB               | 3.7   |  |
| OR 125D<br>OR 225D | 30 0340 0311      | Drum              | 1.9   | Maximum of 2 plastic bag layers, consisting of one inner bag and one filtered liner bag, and no rigid liner in the 55-gallon drums |
|                    | 30 0340 0285      |                   | 3.7   |  |
|                    | 30 0340 0350      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0325      |                   | 3.7   |  |
|                    | 30 0340 0213      | SWB               | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| OR 125E<br>OR 225E | 30 0340 0490      | Drum              | 1.9   | Maximum of 3 plastic bag layers, consisting of two inner bags and one filtered liner bag, and no rigid liner in the 55-gallon drums   |
|                    | 30 0340 0464      |                   | 3.7   |   |
|                    | 30 0340 0530      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0504      |                   | 3.7   |   |
|                    | 30 0340 0392      | SWB               | 3.7   |   |
| OR 125F<br>OR 225F | 30 0340 0669      | Drum              | 1.9   | Maximum of 4 plastic bag layers, consisting of three inner bags and one filtered liner bag, and no rigid liner in the 55-gallon drums |
|                    | 30 0340 0643      |                   | 3.7   |   |
|                    | 30 0340 0709      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0683      |                   | 3.7   |   |
|                    | 30 0340 0571      | SWB               | 3.7   |   |
| OR 125G<br>OR 225G | 30 0340 0848      | Drum              | 1.9   | Maximum of 5 plastic bag layers, consisting of four inner bags and one filtered liner bag, and no rigid liner in the 55-gallon drums  |
|                    | 30 0340 0823      |                   | 3.7   |   |
|                    | 30 0340 0888      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0862      |                   | 3.7   |   |
|                    | 30 0340 0751      | SWB               | 3.7   |   |
| OR 125H<br>OR 225H | 30 0340 1027      | Drum              | 1.9   | Maximum of 6 plastic bag layers, consisting of five inner bags and one filtered liner bag, and no rigid liner in the 55-gallon drums  |
|                    | 30 0340 1002      |                   | 3.7   |   |
|                    | 30 0340 1067      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 1042      |                   | 3.7   |   |
|                    | 30 0340 0930      | SWB               | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 111A<br>RF 211A   | 10 0130 0190      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                      | 10 0130 0154      |                   | 3.7  |  |
|                      | 10 0130 0250      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0215      |                   | 3.7  |  |
|                      | 10 0130 0046      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag   |
| RF 111B<br>RF 211B   | 10 0130 0311      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is an inner bag, and one filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction                                  |
| RF 111D<br>RF 211D   | 10 0130 0175      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction   |
| RF 111DF<br>RF 211DF | 10 0130 0246      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 10 0130 0210      |                   | 3.7  |  |
| RF 111E<br>RF 211E   | 10 0130 0191      | Drum              | 1.9  | Maximum of 4 filtered plastic bags layers, two of which are liner bags, and 2 metal cans, each of which are closed with a slip-top lid   |
|                      | 10 0130 0156      |                   | 3.7  |  |
|                      | 10 0130 0252      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0216      |                   | 3.7  |  |
| RF 111H<br>RF 211H   | 10 0130 0408      | Drum              | 1.9  | Maximum of 2 plastic bag layers, one of which is a liner bag   |
|                      | 10 0130 0373      |                   | 3.7  |  |
|                      | 10 0130 0469      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0433      |                   | 3.7  |  |
|                      | 10 0130 0286      | SWB               | 3.7  |  |
| RF 111J<br>RF 211J   | 10 0130 0257      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
|                      | 10 0130 0221      |                   | 3.7  |  |
|                      | 10 0130 0318      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0282      |                   | 3.7  |  |
| RF 111K<br>RF 211K   | 10 0130 0232      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered can fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction                          |
|                      | 10 0130 0197      |                   | 3.7  |  |
|                      | 10 0130 0293      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0257      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 111P<br>RF 211P   | 10 0130 0212      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 111PF<br>RF 211PF | 10 0130 0319      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 10 0130 0283      |                   | 3.7  |  |
| RF 112A<br>RF 212A   | 40 9999 0169      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                      | 40 9999 0144      |                   | 3.7  |  |
|                      | 40 9999 0209      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0184      |                   | 3.7  |  |
| RF 112B<br>RF 212B   | 40 9999 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag, and one metal can, which is closed with a slip-top lid   |
|                      | 40 9999 0481      |                   | 3.7  |  |
|                      | 40 9999 0546      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0521      |                   | 3.7  |  |
| RF 112D<br>RF 212D   | 40 9999 0174      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 112DF<br>RF 212DF | 40 9999 0250      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 40 9999 0225      |                   | 3.7  |  |
| RF 112J<br>RF 212J   | 40 9999 0179      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction  |
|                      | 40 9999 0153      |                   | 3.7  |  |
|                      | 40 9999 0219      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0193      |                   | 3.7  |  |
| RF 112N<br>RF 212N   | 40 9999 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 40 9999 0481      |                   | 3.7  |  |
|                      | 40 9999 0546      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0521      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|--|---|
| RF 112O<br>RF 212O   | 40 9999 0101      | Drum              | 3.7  | No layers of confinement  |
|                      | 40 9999 0079      |                   | 18.5   |   |
|                      | 40 9999 0075      |                   | 92.5   |   |
|                      | 40 9999 0141      | SWB Overpack      | 3.7  |   |
|                      | 40 9999 0119      |                   | 18.5   |   |
|                      | 40 9999 0115      |                   | 92.5   |   |
| RF 112OA<br>RF 212OA | 40 9999 0099      | Drum              | 3.7  | No layers of confinement and no rigid liner lid   |
|                      | 40 9999 0077      |                   | 18.5   |   |
|                      | 40 9999 0073      |                   | 92.5   |   |
|                      | 40 9999 0139      | SWB Overpack      | 3.7  |   |
|                      | 40 9999 0117      |                   | 18.5   |   |
|                      | 40 9999 0113      |                   | 92.5   |   |
| RF 112P<br>RF 212P   | 40 9999 0105      | Drum              | 3.7  | Maximum of 2 plastic bag layers, both of which are liner bags, which are punctured with a minimum 0.3-inch hole                         |
|                      | 40 9999 0083      |                   | 18.5   |   |
|                      | 40 9999 0079      |                   | 92.5   |   |
|                      | 40 9999 0145      | SWB Overpack      | 3.7  |   |
|                      | 40 9999 0123      |                   | 18.5   |   |
|                      | 40 9999 0119      |                   | 92.5   |   |
| RF 112PA<br>RF 212PA | 40 9999 0103      | Drum              | 3.7  | Maximum of 2 plastic bag layers, both of which are liner bags, which are punctured with a minimum 0.3-inch hole, and no rigid liner lid |
|                      | 40 9999 0081      |                   | 18.5   |   |
|                      | 40 9999 0077      |                   | 92.5   |   |
|                      | 40 9999 0143      | SWB Overpack      | 3.7  |   |
|                      | 40 9999 0121      |                   | 18.5   |   |
|                      | 40 9999 0117      |                   | 92.5   |   |
| RF 112Q<br>RF 212Q   | 40 9999 0122      | Drum              | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag  |
|                      | 40 9999 0101      |                   | 18.5   |   |
|                      | 40 9999 0096      |                   | 92.5   |   |
|                      | 40 9999 0162      | SWB Overpack      | 3.7  |   |
|                      | 40 9999 0141      |                   | 18.5   |   |
|                      | 40 9999 0136      |                   | 92.5   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 112QA<br>RF 212QA | 40 9999 0120      | Drum              | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag, and no rigid liner lid   |
|                      | 40 9999 0099      |                   | 18.5   |  |
|                      | 40 9999 0094      |                   | 92.5   |  |
|                      | 40 9999 0160      | SWB Overpack      | 3.7  |  |
|                      | 40 9999 0139      |                   | 18.5   |  |
|                      | 40 9999 0134      |                   | 92.5   |  |
| RF 113A<br>RF 213A   | 40 9999 0169      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                      | 40 9999 0144      |                   | 3.7  |  |
|                      | 40 9999 0209      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0184      |                   | 3.7  |  |
| RF 114A<br>RF 214A   | 10 0040 0648      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 10 0040 0613      |                   | 3.7  |  |
|                      | 10 0040 0709      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0673      |                   | 3.7  |  |
| RF 114B<br>RF 214B   | 10 0040 0669      | Drum              | 1.9  | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 10 0040 0634      |                   | 3.7  |  |
|                      | 10 0040 0730      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0695      |                   | 3.7  |  |
| RF 114D<br>RF 214D   | 10 0040 0629      | Pipe Overpack     | 3.7  | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
| RF 114DF<br>RF 214DF | 10 0040 0700      | Pipe Overpack     | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe component   |
|                      | 10 0040 0664      |                   | 3.7  |  |
| RF 114E<br>RF 214E   | 10 0040 0191      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, two of which are liner bags  |
|                      | 10 0040 0156      |                   | 3.7  |  |
|                      | 10 0040 0252      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0216      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 114F<br>RF 214F   | 10 0040 0191      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, two of which are liner bags  |
|                      | 10 0040 0156      |                   | 3.7  |  |
|                      | 10 0040 0252      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0216      |                   | 3.7  |  |
| RF 114G<br>RF 214G   | 10 0040 0175      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction   |
| RF 114GF<br>RF 214GF | 10 0040 0246      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 10 0040 0210      |                   | 3.7  |  |
| RF 114J<br>RF 214J   | 10 0040 0266      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, two of which are liner bags, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
|                      | 10 0040 0231      |                   | 3.7  |  |
|                      | 10 0040 0327      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0291      |                   | 3.7  |  |
| RF 114JF<br>RF 214JF | 10 0040 0337      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, two of which are liner bags, and 2 filtered metal cans   |
|                      | 10 0040 0302      |                   | 3.7  |  |
|                      | 10 0040 0398      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0362      |                   | 3.7  |  |
| RF 114K<br>RF 214K   | 10 0040 0190      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                      | 10 0040 0154      |                   | 3.7  |  |
|                      | 10 0040 0250      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0215      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 114L<br>RF 214L   | 10 0040 0166      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags   |
|                      | 10 0040 0130      |                   | 3.7   |  |
|                      | 10 0040 0226      | SWB Overpack      | 1.9   |  |
|                      | 10 0040 0191      |                   | 3.7   |  |
| RF 114P<br>RF 214P   | 10 0040 0212      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 114PF<br>RF 214PF | 10 0040 0319      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 10 0040 0283      |                   | 3.7   |  |
| RF 115A<br>RF 215A   | 20 0170 0528      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 20 0170 0502      |                   | 3.7   |  |
|                      | 20 0170 0568      | SWB Overpack      | 1.9   |  |
|                      | 20 0170 0542      |                   | 3.7   |  |
| RF 115B<br>RF 215B   | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement  |
|                      | 20 0000 0000      |                   | 3.7   |  |
|                      | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                      | 20 0000 0000      |                   | 3.7   |  |
| RF 115D<br>RF 215D   | 20 0000 0000      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement in a pipe overpack   |
|                      | 20 0000 0000      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| RF 115E<br>RF 215E | 20 0170 0179      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                    | 20 0170 0153      |                   | 3.7  |   |
|                    | 20 0170 0219      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0193      |                   | 3.7  |   |
| RF 115F<br>RF 215F | 20 0170 0140      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                    | 20 0170 0114      |                   | 3.7  |   |
|                    | 20 0170 0180      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0154      |                   | 3.7  |   |
| RF 115N<br>RF 215N | 20 0170 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0481      |                   | 3.7  |   |
|                    | 20 0170 0546      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0521      |                   | 3.7  |   |
|                    | 20 0170 0399      | SWB               | 3.7  |   |
| RF 116A<br>RF 216A | 30 0340 0528      | Drum              | 1.9  | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0502      |                   | 3.7  |   |
|                    | 30 0340 0568      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0542      |                   | 3.7  |   |
|                    | 30 0340 0041      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag  |
| RF 116C<br>RF 216C | 30 0340 0169      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                    | 30 0340 0144      |                   | 3.7  |   |
|                    | 30 0340 0209      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0184      |                   | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 116D<br>RF 216D   | 30 0340 0147      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| RF 116DF<br>RF 216DF | 30 0340 0198      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 30 0340 0172      |                   | 3.7   |  |
| RF 116E<br>RF 216E   | 30 0340 0179      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                  |
|                      | 30 0340 0153      |                   | 3.7   |  |
|                      | 30 0340 0219      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0193      |                   | 3.7   |  |
|                      | 30 0340 0079      | SWB               | 3.7   |  |
| RF 116EF<br>RF 216EF | 30 0340 0205      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can  |
|                      | 30 0340 0179      |                   | 3.7   |  |
|                      | 30 0340 0244      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0219      |                   | 3.7   |  |
|                      | 30 0340 0105      | SWB               | 3.7   |  |
| RF 116F<br>RF 216F   | 30 0340 0140      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags   |
|                      | 30 0340 0114      |                   | 3.7   |  |
|                      | 30 0340 0180      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0154      |                   | 3.7   |  |
|                      | 30 0340 0034      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RF 116G<br>RF 216G   | 30 0340 0170      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0144      |                   | 3.7   |   |
|                      | 30 0340 0209      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0184      |                   | 3.7   |   |
|                      | 30 0340 0070      | SWB               | 3.7   |   |
| RF 116GF<br>RF 216GF | 30 0340 0195      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can   |
|                      | 30 0340 0170      |                   | 3.7   |   |
|                      | 30 0340 0235      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0209      |                   | 3.7   |   |
|                      | 30 0340 0096      | SWB               | 3.7   |   |
| RF 116H<br>RF 216H   | 30 0340 0220      | SWB               | 3.7   | Maximum of 2 plastic bag layers, one of which is a liner bag  |
| RF 116I<br>RF 216I   | 30 0340 0152      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0126      |                   | 3.7   |   |
|                      | 30 0340 0192      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0166      |                   | 3.7   |   |
|                      | 30 0340 0052      | SWB               | 3.7   |   |
| RF 116J<br>RF 216J   | 30 0340 0686      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0660      |                   | 3.7   |   |
|                      | 30 0340 0725      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0700      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RF 116K<br>RF 216K   | 30 0340 0188      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0163      |                   | 3.7   |   |
|                      | 30 0340 0228      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0202      |                   | 3.7   |   |
| RF 116KF<br>RF 216KF | 30 0340 0214      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0188      |                   | 3.7   |   |
|                      | 30 0340 0254      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0228      |                   | 3.7   |   |
| RF 116L<br>RF 216L   | 30 0340 0865      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0839      |                   | 3.7   |   |
|                      | 30 0340 0905      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0879      |                   | 3.7   |   |
| RF 116M<br>RF 216M   | 30 0340 0198      | Drum              | 1.9   | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0172      |                   | 3.7   |   |
|                      | 30 0340 0237      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0212      |                   | 3.7   |   |
| RF 116MF<br>RF 216MF | 30 0340 0223      | Drum              | 1.9   | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0198      |                   | 3.7   |   |
|                      | 30 0340 0263      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0237      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 116N<br>RF 216N   | 30 0340 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0481      |                   | 3.7  |  |
|                      | 30 0340 0546      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0521      |                   | 3.7  |  |
|                      | 30 0340 0399      | SWB               | 3.7  |  |
| RF 116P<br>RF 216P   | 30 0340 0174      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 116PF<br>RF 216PF | 30 0340 0250      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 30 0340 0225      |                   | 3.7  |  |
| RF 116Q<br>RF 216Q   | 30 0340 0485      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags  |
|                      | 30 0340 0459      |                   | 3.7  |  |
|                      | 30 0340 0525      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0499      |                   | 3.7  |  |
| RF 116R<br>RF 216R   | 30 0340 0713      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction   |
|                      | 30 0340 0687      |                   | 3.7  |  |
|                      | 30 0340 0752      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0727      |                   | 3.7  |  |
| RF 116RF<br>RF 216RF | 30 0340 0738      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0713      |                   | 3.7  |  |
|                      | 30 0340 0778      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0752      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 116S<br>RF 216S   | 30 0340 0892      | Drum              | 1.9  | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0866      |                   | 3.7  |  |
|                      | 30 0340 0932      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0906      |                   | 3.7  |  |
| RF 116SF<br>RF 216SF | 30 0340 0918      | Drum              | 1.9  | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0892      |                   | 3.7  |  |
|                      | 30 0340 0957      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0932      |                   | 3.7  |  |
| RF 116T<br>RF 216T   | 30 0340 0043      | SWB               | 3.7  | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 117A<br>RF 217A   | 20 0170 0528      | Drum              | 1.9  | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 20 0170 0502      |                   | 3.7  |  |
|                      | 20 0170 0568      | SWB Overpack      | 1.9  |  |
|                      | 20 0170 0542      |                   | 3.7  |  |
|                      | 20 0170 0041      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag   |
|                      | 20 0170 0372      | TDOP              | 3.7  | Maximum of 2 plastic bag layers, both of which are inner bags  |
| RF 117B<br>RF 217B   | 20 0000 0000      | Drum              | 1.9  | Metal can as innermost layer of confinement  |
|                      | 20 0000 0000      |                   | 3.7  |  |
|                      | 20 0000 0000      | SWB Overpack      | 1.9  |  |
|                      | 20 0000 0000      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| RF 117C<br>RF 217C | 20 0170 0169      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                    | 20 0170 0144      |                   | 3.7  |   |
|                    | 20 0170 0209      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0184      |                   | 3.7  |   |
| RF 117D<br>RF 217D | 20 0000 0000      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement in a pipe overpack  |
|                    | 20 0000 0000      |                   | 3.7  |   |
| RF 117E<br>RF 217E | 20 0170 0179      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
|                    | 20 0170 0153      |                   | 3.7  |   |
|                    | 20 0170 0219      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0193      |                   | 3.7  |   |
|                    | 20 0170 0079      | SWB               | 3.7  |   |
| RF 117F<br>RF 217F | 20 0170 0140      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                    | 20 0170 0114      |                   | 3.7  |   |
|                    | 20 0170 0180      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0154      |                   | 3.7  |   |
|                    | 20 0170 0034      | SWB               | 3.7  | Maximum of 1 filtered plastic bag layer, which is a liner bag   |
| RF 117H<br>RF 217H | 20 0170 0220      | SWB               | 3.7  | Maximum of 2 plastic bag layers, one of which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RF 117I<br>RF 217I | 20 0170 0152      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0126      |                   | 3.7   |  |
|                    | 20 0170 0192      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0166      |                   | 3.7   |  |
|                    | 20 0170 0052      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags |
|                    | 20 0170 0032      | TDOP              | 3.7   |  |
| RF 117K<br>RF 217K | 20 0170 0062      | SWB               | 3.7   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag  |
| RF 117N<br>RF 217N | 20 0170 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag           |
|                    | 20 0170 0481      |                   | 3.7   |  |
|                    | 20 0170 0546      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0521      |                   | 3.7   |  |
|                    | 20 0170 0399      | SWB               | 3.7   |  |
| RF 117T<br>RF 217T | 20 0170 0043      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 118A<br>RF 218A | 20 0170 0528      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags           |
|                    | 20 0170 0502      |                   | 3.7   |  |
|                    | 20 0170 0568      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0542      |                   | 3.7   |  |
|                    | 20 0170 0041      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag                   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| RF 118B<br>RF 218B | 20 0000 0000      | Drum              | 1.9  | Metal can as innermost layer of confinement   |
|                    | 20 0000 0000      |                   | 3.7  |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9  |   |
|                    | 20 0000 0000      |                   | 3.7  |   |
| RF 118C<br>RF 218C | 20 0170 0169      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                    | 20 0170 0144      |                   | 3.7  |   |
|                    | 20 0170 0209      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0184      |                   | 3.7  |   |
| RF 118D<br>RF 218D | 20 0000 0000      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement in a pipe overpack  |
|                    | 20 0000 0000      |                   | 3.7  |   |
| RF 118E<br>RF 218E | 20 0170 0179      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                    | 20 0170 0153      |                   | 3.7  |   |
|                    | 20 0170 0219      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0193      |                   | 3.7  |   |
|                    | 20 0170 0079      | SWB               | 3.7  |   |
| RF 118F<br>RF 218F | 20 0170 0140      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                    | 20 0170 0114      |                   | 3.7  |   |
|                    | 20 0170 0180      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0154      |                   | 3.7  |   |
|                    | 20 0170 0034      | SWB               | 3.7  | Maximum of 1 filtered plastic bag layer, which is a liner bag   |
| RF 118H<br>RF 218H | 20 0170 0220      | SWB               | 3.7  | Maximum of 2 plastic bag layers, one of which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 118I<br>RF 218I   | 20 0170 0152      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                      | 20 0170 0126      |                   | 3.7   |  |
|                      | 20 0170 0192      | SWB Overpack      | 1.9   |  |
|                      | 20 0170 0166      |                   | 3.7   |  |
|                      | 20 0170 0052      | SWB               | 3.7   |  |
| RF 118N<br>RF 218N   | 20 0170 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 20 0170 0481      |                   | 3.7   |  |
|                      | 20 0170 0546      | SWB Overpack      | 1.9   |  |
|                      | 20 0170 0521      |                   | 3.7   |  |
|                      | 20 0170 0399      | SWB               | 3.7   |  |
| RF 118T<br>RF 218T   | 20 0170 0043      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 119A<br>RF 219A   | 30 0340 0528      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 30 0340 0502      |                   | 3.7   |  |
|                      | 30 0340 0568      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0542      |                   | 3.7   |  |
|                      | 30 0340 0041      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag   |
| RF 119BA<br>RF 219BA | 30 0340 0533      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0508      |                   | 3.7   |  |
|                      | 30 0340 0573      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0548      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|------------------------|-------------------|-------------------|---|--|
| RF 119BAF<br>RF 219BAF | 30 0340 0559      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                        | 30 0340 0533      |                   | 3.7   |  |
|                        | 30 0340 0599      | SWB Overpack      | 1.9   |  |
|                        | 30 0340 0573      |                   | 3.7   |  |
| RF 119C<br>RF 219C     | 30 0340 0169      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                        | 30 0340 0144      |                   | 3.7   |  |
|                        | 30 0340 0209      | SWB Overpack      | 1.9   |  |
|                        | 30 0340 0184      |                   | 3.7   |  |
| RF 119D<br>RF 219D     | 30 0340 0147      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| RF 119DF<br>RF 219DF   | 30 0340 0198      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                        | 30 0340 0172      |                   | 3.7   |  |
| RF 119E<br>RF 219E     | 30 0340 0179      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                  |
|                        | 30 0340 0153      |                   | 3.7   |  |
|                        | 30 0340 0219      | SWB Overpack      | 1.9   |  |
|                        | 30 0340 0193      |                   | 3.7   |  |
|                        | 30 0340 0079      | SWB               | 3.7   |  |
| RF 119EF<br>RF 219EF   | 30 0340 0205      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can  |
|                        | 30 0340 0179      |                   | 3.7   |  |
|                        | 30 0340 0244      | SWB Overpack      | 1.9   |  |
|                        | 30 0340 0219      |                   | 3.7   |  |
|                        | 30 0340 0105      | SWB               | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RF 119F<br>RF 219F   | 30 0340 0140      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                      | 30 0340 0114      |                   | 3.7   |   |
|                      | 30 0340 0180      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0154      |                   | 3.7   |   |
|                      | 30 0340 0034      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag   |
| RF 119G<br>RF 219G   | 30 0340 0170      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0144      |                   | 3.7   |   |
|                      | 30 0340 0209      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0184      |                   | 3.7   |   |
|                      | 30 0340 0070      | SWB               | 3.7   |   |
| RF 119GF<br>RF 219GF | 30 0340 0195      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can   |
|                      | 30 0340 0170      |                   | 3.7   |   |
|                      | 30 0340 0235      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0209      |                   | 3.7   |   |
|                      | 30 0340 0096      | SWB               | 3.7   |   |
| RF 119H<br>RF 219H   | 30 0340 0220      | SWB               | 3.7   | Maximum of 2 plastic bag layers, one of which is a liner bag  |
| RF 119I<br>RF 219I   | 30 0340 0152      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0126      |                   | 3.7   |   |
|                      | 30 0340 0192      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0166      |                   | 3.7   |   |
|                      | 30 0340 0052      | SWB               | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RF 119J<br>RF 219J   | 30 0340 0686      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0660      |                   | 3.7   |   |
|                      | 30 0340 0725      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0700      |                   | 3.7   |   |
| RF 119K<br>RF 219K   | 30 0340 0188      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0163      |                   | 3.7   |   |
|                      | 30 0340 0228      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0202      |                   | 3.7   |   |
| RF 119KF<br>RF 219KF | 30 0340 0214      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0188      |                   | 3.7   |   |
|                      | 30 0340 0254      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0228      |                   | 3.7   |   |
| RF 119L<br>RF 219L   | 30 0340 0865      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0839      |                   | 3.7   |   |
|                      | 30 0340 0905      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0879      |                   | 3.7   |   |
| RF 119M<br>RF 219M   | 30 0340 0198      | Drum              | 1.9   | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0172      |                   | 3.7   |   |
|                      | 30 0340 0237      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0212      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 119MF<br>RF 219MF | 30 0340 0223      | Drum              | 1.9  | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container  |
|                      | 30 0340 0198      |                   | 3.7  |  |
|                      | 30 0340 0263      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0237      |                   | 3.7  |  |
| RF 119N<br>RF 219N   | 30 0340 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0481      |                   | 3.7  |  |
|                      | 30 0340 0546      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0521      |                   | 3.7  |  |
|                      | 30 0340 0399      | SWB               | 3.7  |  |
| RF 119P<br>RF 219P   | 30 0340 0174      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 119PF<br>RF 219PF | 30 0340 0250      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 30 0340 0225      |                   | 3.7  |  |
| RF 119Q<br>RF 219Q   | 30 0340 0485      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags  |
|                      | 30 0340 0459      |                   | 3.7  |  |
|                      | 30 0340 0525      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0499      |                   | 3.7  |  |
| RF 119R<br>RF 219R   | 30 0340 0713      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction   |
|                      | 30 0340 0687      |                   | 3.7  |  |
|                      | 30 0340 0752      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0727      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 119RF<br>RF 219RF | 30 0340 0738      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0713      |                   | 3.7   |  |
|                      | 30 0340 0778      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0752      |                   | 3.7   |  |
| RF 119S<br>RF 219S   | 30 0340 0892      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0866      |                   | 3.7   |  |
|                      | 30 0340 0932      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0906      |                   | 3.7   |  |
| RF 119SF<br>RF 219SF | 30 0340 0918      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0892      |                   | 3.7   |  |
|                      | 30 0340 0957      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0932      |                   | 3.7   |  |
| RF 119T<br>RF 219T   | 30 0340 0043      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 119W<br>RF 219W   | 30 0340 0161      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a filtered liner bag   |
|                      | 30 0340 0136      |                   | 3.7   |  |
|                      | 30 0340 0201      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0175      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|------------------------|-------------------|-------------------|--|--|
| RF 121A<br>RF 221A     | 30 0340 0528      | Drum              | 1.9  | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                        | 30 0340 0502      |                   | 3.7  |  |
|                        | 30 0340 0568      | SWB Overpack      | 1.9  |  |
|                        | 30 0340 0542      |                   | 3.7  |  |
|                        | 30 0340 0041      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag   |
|                        | 30 0340 0372      | TDOP              | 3.7  | Maximum of 2 plastic bag layers, both of which are inner bags  |
| RF 121D<br>RF 221D     | 30 0340 0512      | Pipe Overpack     | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction          |
|                        | 30 0340 0486      |                   | 3.7  |  |
| RF 121DF<br>RF 221DF   | 30 0340 0538      | Pipe Overpack     | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                        | 30 0340 0512      |                   | 3.7  |  |
| RF 121DA<br>RF 221DA   | 30 0340 0147      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| RF 121DAF<br>RF 221DAF | 30 0340 0198      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                        | 30 0340 0172      |                   | 3.7  |  |
| RF 121E<br>RF 221E     | 30 0340 0179      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                  |
|                        | 30 0340 0153      |                   | 3.7  |  |
|                        | 30 0340 0219      | SWB Overpack      | 1.9  |  |
|                        | 30 0340 0193      |                   | 3.7  |  |
|                        | 30 0340 0079      | SWB               | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| RF 121F<br>RF 221F | 30 0340 0140      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags   |
|                    | 30 0340 0114      |                   | 3.7  |  |
|                    | 30 0340 0180      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0154      |                   | 3.7  |  |
|                    | 30 0340 0034      | SWB               | 3.7  | Maximum of 1 filtered plastic bag layer, which is a liner bag  |
| RF 121H<br>RF 221H | 30 0340 0220      | SWB               | 3.7  | Maximum of 2 plastic bag layers, one of which is a liner bag   |
| RF 121I<br>RF 221I | 30 0340 0152      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0126      |                   | 3.7  |  |
|                    | 30 0340 0192      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0166      |                   | 3.7  |  |
|                    | 30 0340 0052      | SWB               | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags   |
|                    | 30 0340 0032      | TDOP              | 3.7  |  |
| RF 121J<br>RF 221J | 30 0340 0206      | Drum              | 1.9  | Filtered metal can as innermost layer of confinement within a maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can. Both filtered metal cans are fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction. |
|                    | 30 0340 0180      |                   | 3.7  |  |
|                    | 30 0340 0246      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0220      |                   | 3.7  |  |
| RF 121K<br>RF 221K | 30 0340 0062      | SWB               | 3.7  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RF 121N<br>RF 221N | 30 0340 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag                   |
|                    | 30 0340 0481      |                   | 3.7   |  |
|                    | 30 0340 0546      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0521      |                   | 3.7   |  |
|                    | 30 0340 0399      | SWB               | 3.7   |  |
| RF 121T<br>RF 221T | 30 0340 0043      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag          |
| RF 121W<br>RF 221W | 30 0340 0161      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a filtered liner bag |
|                    | 30 0340 0136      |                   | 3.7   |  |
|                    | 30 0340 0201      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0175      |                   | 3.7   |  |
| RF 122A<br>RF 222A | 20 0170 0528      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags                   |
|                    | 20 0170 0502      |                   | 3.7   |  |
|                    | 20 0170 0568      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0542      |                   | 3.7   |  |
|                    | 20 0170 0041      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag                           |
| RF 122B<br>RF 222B | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement                                    |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                    | 20 0000 0000      |                   | 3.7   |  |
| RF 122D<br>RF 222D | 20 0000 0000      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement in a pipe overpack                 |
|                    | 20 0000 0000      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| RF 122E<br>RF 222E | 20 0170 0179      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can layer with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
|                    | 20 0170 0153      |                   | 3.7  |  |
|                    | 20 0170 0219      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0193      |                   | 3.7  |  |
|                    | 20 0170 0079      | SWB               | 3.7  |  |
| RF 122F<br>RF 222F | 20 0170 0140      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags   |
|                    | 20 0170 0114      |                   | 3.7  |  |
|                    | 20 0170 0180      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0154      |                   | 3.7  |  |
|                    | 20 0170 0034      | SWB               | 3.7  | Maximum of 1 filtered plastic bag layer, which is a liner bag  |
| RF 122H<br>RF 222H | 20 0170 0220      | SWB               | 3.7  | Maximum of 2 plastic bag layers, one of which is a liner bag   |
| RF 122I<br>RF 222I | 20 0170 0152      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0126      |                   | 3.7  |  |
|                    | 20 0170 0192      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0166      |                   | 3.7  |  |
|                    | 20 0170 0052      | SWB               | 3.7  |  |
| RF 122N<br>RF 222N | 20 0170 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                    | 20 0170 0481      |                   | 3.7  |  |
|                    | 20 0170 0546      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0521      |                   | 3.7  |  |
|                    | 20 0170 0399      | SWB               | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RF 122T<br>RF 222T | 20 0170 0043      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 123A<br>RF 223A | 30 0340 0528      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags           |
|                    | 30 0340 0502      |                   | 3.7   |  |
|                    | 30 0340 0568      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0542      |                   | 3.7   |  |
| RF 123E<br>RF 223E | 30 0340 0169      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags          |
|                    | 30 0340 0144      |                   | 3.7   |  |
|                    | 30 0340 0209      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0184      |                   | 3.7   |  |
| RF 123F<br>RF 223F | 30 0340 0140      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags |
|                    | 30 0340 0114      |                   | 3.7   |  |
|                    | 30 0340 0180      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0154      |                   | 3.7   |  |
|                    | 30 0340 0034      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag          |
| RF 123I<br>RF 223I | 30 0340 0152      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0126      |                   | 3.7   |  |
|                    | 30 0340 0192      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0166      |                   | 3.7   |  |
|                    | 30 0340 0052      | SWB               | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 123N<br>RF 223N   | 30 0340 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0481      |                   | 3.7   |  |
|                      | 30 0340 0546      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0521      |                   | 3.7   |  |
|                      | 30 0340 0399      | SWB               | 3.7   |  |
| RF 124B<br>RF 224B   | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement  |
|                      | 20 0000 0000      |                   | 3.7   |  |
|                      | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                      | 20 0000 0000      |                   | 3.7   |  |
| RF 124D<br>RF 224D   | 20 0000 0000      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement in a pipe overpack   |
|                      | 20 0000 0000      |                   | 3.7   |  |
| RF 124E<br>RF 224E   | 20 0008 0229      | Drum              | 1.9   | Metal can as innermost layer of confinement within a maximum of 1 filtered metal can, and 4 filtered plastic bag layers, two of which are liner bags. The filtered metal can is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction.   |
|                      | 20 0008 0193      |                   | 3.7   |  |
|                      | 20 0008 0289      | SWB Overpack      | 1.9   |  |
|                      | 20 0008 0254      |                   | 3.7   |  |
| RF 124F<br>RF 224F   | 20 0008 0212      | Pipe Overpack     | 3.7   | Metal can as innermost layer of confinement within a maximum of 1 filtered metal can, and 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 124FF<br>RF 224FF | 20 0008 0319      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement within a maximum of 1 filtered metal can, and 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                      | 20 0008 0283      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|--|---|
| RF 124G<br>RF 224G   | 20 0008 0175      | Pipe Overpack     | 3.7  | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| RF 124GF<br>RF 224GF | 20 0008 0246      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 20 0008 0210      |                   | 3.7  |   |
| RF 124H<br>RF 224H   | 20 0008 0629      | Pipe Overpack     | 3.7  | Metal can as innermost layer of confinement within a maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction          |
| RF 124HF<br>RF 224HF | 20 0008 0700      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                      | 20 0008 0664      |                   | 3.7  |   |
| RF 126A<br>RF 226A   | 30 0340 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0481      |                   | 3.7  |   |
|                      | 30 0340 0546      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0521      |                   | 3.7  |   |
| RF 126D<br>RF 226D   | 30 0340 0486      | Pipe Overpack     | 3.7  | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction   |
| RF 126DF<br>RF 226DF | 30 0340 0538      | Pipe Overpack     | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 30 0340 0512      |                   | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|------------------------|-------------------|-------------------|--|---|
| RF 126DA<br>RF 226DA   | 30 0340 0147      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction    |
| RF 126DAF<br>RF 226DAF | 30 0340 0198      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                        | 30 0340 0172      |                   | 3.7  |   |
| RF 126E<br>RF 226E     | 30 0340 0152      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag.  |
|                        | 30 0340 0126      |                   | 3.7  |   |
|                        | 30 0340 0192      | SWB Overpack      | 1.9  |   |
|                        | 30 0340 0166      |                   | 3.7  |   |
| RF 126J<br>RF 226J     | 30 0340 0206      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
|                        | 30 0340 0180      |                   | 3.7  |   |
|                        | 30 0340 0246      | SWB Overpack      | 1.9  |   |
|                        | 30 0340 0220      |                   | 3.7  |   |
| RF 126K<br>RF 226K     | 30 0340 0169      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                        | 30 0340 0144      |                   | 3.7  |   |
|                        | 30 0340 0209      | SWB Overpack      | 1.9  |   |
|                        | 30 0340 0184      |                   | 3.7  |   |
| RF 126L<br>RF 226L     | 30 0340 0140      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                        | 30 0340 0114      |                   | 3.7  |   |
|                        | 30 0340 0180      | SWB Overpack      | 1.9  |   |
|                        | 30 0340 0154      |                   | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|--|---|
| RF 126P<br>RF 226P   | 30 0340 0174      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| RF 126PF<br>RF 226PF | 30 0340 0250      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack   |
|                      | 30 0340 0225      |                   | 3.7  |   |
| RF 127A<br>RF 227A   | 30 0340 0169      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags.  |
|                      | 30 0340 0144      |                   | 3.7  |   |
|                      | 30 0340 0209      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0184      |                   | 3.7  |   |
|                      | 30 0340 0041      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag.   |
| RF 127D<br>RF 227D   | 30 0340 0147      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction.   |
| RF 127DF<br>RF 227DF | 30 0340 0198      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack.   |
|                      | 30 0340 0172      |                   | 3.7  |   |
| RF 127E<br>RF 227E   | 30 0340 0159      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, two of which are liner bags, and 2 metal cans, each of which are closed with a slip-top lid.  |
|                      | 30 0340 0133      |                   | 3.7  |   |
|                      | 30 0340 0198      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0173      |                   | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| RF 127F<br>RF 227F | 30 0340 0140      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags.   |
|                    | 30 0340 0114      |                   | 3.7   |   |
|                    | 30 0340 0180      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0154      |                   | 3.7   |   |
|                    | 30 0340 0034      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag.  |
| RF 127H<br>RF 227H | 30 0340 0327      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0302      |                   | 3.7   |   |
|                    | 30 0340 0367      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0341      |                   | 3.7   |   |
| RF 127J<br>RF 227J | 30 0340 0206      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
|                    | 30 0340 0180      |                   | 3.7   |   |
|                    | 30 0340 0246      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0220      |                   | 3.7   |   |
| RF 127K<br>RF 227K | 30 0340 0188      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, 1 of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction.                      |
|                    | 30 0340 0163      |                   | 3.7   |   |
|                    | 30 0340 0228      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0202      |                   | 3.7   |   |
| RF 127N<br>RF 227N | 30 0340 0148      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag.   |
|                    | 30 0340 0122      |                   | 3.7   |   |
|                    | 30 0340 0188      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0162      |                   | 3.7   |   |
|                    | 30 0340 0399      | SWB               | 3.7   | Maximum of 3 plastic bag layers, 1 of which is a liner bag.   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 127P<br>RF 227P   | 30 0340 0174      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 127PF<br>RF 227PF | 30 0340 0250      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack.   |
|                      | 30 0340 0225      |                   | 3.7   |  |
| RF 130A<br>RF 230A   | 30 0185 0528      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 30 0185 0502      |                   | 3.7   |  |
|                      | 30 0185 0568      | SWB Overpack      | 1.9   |  |
|                      | 30 0185 0542      |                   | 3.7   |  |
|                      | 30 0185 0041      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag   |
|                      | 30 0185 0372      | TDOP              | 3.7   | Maximum of 2 plastic bag layers, both of which are inner bags  |
| RF 130B<br>RF 230B   | 30 0034 0528      | Drum              | 1.9   | Metal can as innermost layer of confinement within a maximum of 4 plastic bag layers, two of which are liner bags  |
|                      | 30 0034 0502      |                   | 3.7   |  |
|                      | 30 0034 0568      | SWB Overpack      | 1.9   |  |
|                      | 30 0034 0542      |                   | 3.7   |  |
| RF 130BA<br>RF 230BA | 30 0034 0533      | Drum              | 1.9   | Metal can as innermost layer of confinement within a maximum of 3 plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                                    |
|                      | 30 0034 0508      |                   | 3.7   |  |
|                      | 30 0034 0573      | SWB Overpack      | 1.9   |  |
|                      | 30 0034 0548      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|--|---|
| RF 130D<br>RF 230D   | 30 0034 0512      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction          |
|                      | 30 0034 0486      |                   | 3.7  |   |
| RF 130DF<br>RF 230DF | 30 0034 0538      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                      | 30 0034 0512      |                   | 3.7  |   |
| RF 130E<br>RF 230E   | 30 0034 0159      | Drum              | 1.9  | Metal can as innermost layer of confinement within a maximum of 4 filtered plastic bag layers, two of which are liner bags  |
|                      | 30 0034 0133      |                   | 3.7  |   |
|                      | 30 0034 0198      | SWB Overpack      | 1.9  |   |
|                      | 30 0034 0173      |                   | 3.7  |   |
| RF 130F<br>RF 230F   | 30 0185 0159      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, two of which are liner bags   |
|                      | 30 0185 0133      |                   | 3.7  |   |
|                      | 30 0185 0198      | SWB Overpack      | 1.9  |   |
|                      | 30 0185 0173      |                   | 3.7  |   |
|                      | 30 0185 0034      | SWB               | 3.7  | Maximum of 1 filtered plastic bag layer, which is a liner bag   |
| RF 130G<br>RF 230G   | 30 0034 0172      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
|                      | 30 0034 0147      |                   | 3.7  |   |
| RF 130GF<br>RF 230GF | 30 0034 0198      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 30 0034 0172      |                   | 3.7  |   |
| RF 130H<br>RF 230H   | 30 0185 0220      | SWB               | 3.7  | Maximum of 2 plastic bag layers, one of which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| RF 130I<br>RF 230I | 30 0185 0152      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag   |
|                    | 30 0185 0126      |                   | 3.7   |   |
|                    | 30 0185 0192      | SWB Overpack      | 1.9   |   |
|                    | 30 0185 0166      |                   | 3.7   |   |
|                    | 30 0185 0052      | SWB               | 3.7   | Maximum of 2 filtered plastic bags, both of which are inner bags  |
|                    | 30 0185 0032      | TDOP              | 3.7   |   |
| RF 130J<br>RF 230J | 30 0034 0206      | Drum              | 1.9   | Filtered metal can as innermost layer of confinement within a maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can. Both filtered metal cans are fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction.  |
|                    | 30 0034 0180      |                   | 3.7   |   |
|                    | 30 0034 0246      | SWB Overpack      | 1.9   |   |
|                    | 30 0034 0220      |                   | 3.7   |   |
| RF 130K<br>RF 230K | 30 0185 0713      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction  |
|                    | 30 0185 0687      |                   | 3.7   |   |
|                    | 30 0185 0752      | SWB Overpack      | 1.9   |   |
|                    | 30 0185 0727      |                   | 3.7   |   |
|                    | 30 0185 0062      | SWB               | 3.7   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag   |
| RF 130N<br>RF 230N | 30 0185 0399      | SWB               | 3.7   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
| RF 130P<br>RF 230P | 30 0034 0174      | Pipe Overpack     | 3.7   | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|------------------------|-------------------|-------------------|---|---|
| RF 130PF<br>RF 230PF   | 30 0034 0250      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                        | 30 0034 0225      |                   | 3.7   |   |
| RF 130PA<br>RF 230PA   | 30 0034 0513      | Pipe Overpack     | 3.7   | Metal can as innermost layer of confinement within 2 plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 130PAF<br>RF 230PAF | 30 0034 0590      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement within 2 plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                        | 30 0034 0565      |                   | 3.7   |   |
| RF 130Q<br>RF 230Q     | 30 0185 0686      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag  |
|                        | 30 0185 0660      |                   | 3.7   |   |
|                        | 30 0185 0725      | SWB Overpack      | 1.9   |   |
|                        | 30 0185 0700      |                   | 3.7   |   |
| RF 130R<br>RF 230R     | 30 0185 0188      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a hydrogen diffusivity of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction   |
|                        | 30 0185 0163      |                   | 3.7   |   |
|                        | 30 0185 0228      | SWB Overpack      | 1.9   |   |
|                        | 30 0185 0202      |                   | 3.7   |   |
| RF 130RF<br>RF 230RF   | 30 0185 0214      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                        | 30 0185 0188      |                   | 3.7   |   |
|                        | 30 0185 0254      | SWB Overpack      | 1.9   |   |
|                        | 30 0185 0228      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RF 130S<br>RF 230S   | 30 0185 0892      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction          |
|                      | 30 0185 0866      |                   | 3.7   |   |
|                      | 30 0185 0932      | SWB Overpack      | 1.9   |   |
|                      | 30 0185 0906      |                   | 3.7   |   |
| RF 130SF<br>RF 230SF | 30 0185 0918      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container  |
|                      | 30 0185 0892      |                   | 3.7   |   |
|                      | 30 0185 0957      | SWB Overpack      | 1.9   |   |
|                      | 30 0185 0932      |                   | 3.7   |   |
| RF 130T<br>RF 230T   | 30 0185 0043      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag   |
| RF 130U<br>RF 230U   | 30 0185 0865      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag  |
|                      | 30 0185 0839      |                   | 3.7   |   |
|                      | 30 0185 0905      | SWB Overpack      | 1.9   |   |
|                      | 30 0185 0879      |                   | 3.7   |   |
| RF 130V<br>RF 230V   | 30 0185 0198      | Drum              | 1.9   | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0185 0172      |                   | 3.7   |   |
|                      | 30 0185 0237      | SWB Overpack      | 1.9   |   |
|                      | 30 0185 0212      |                   | 3.7   |   |
| RF 130VF<br>RF 230VF | 30 0185 0223      | Drum              | 1.9   | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0185 0198      |                   | 3.7   |   |
|                      | 30 0185 0263      | SWB Overpack      | 1.9   |   |
|                      | 30 0185 0237      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| RF 130W<br>RF 230W | 30 0185 0161      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a filtered liner bag  |
|                    | 30 0185 0136      |                   | 3.7   |   |
|                    | 30 0185 0201      | SWB Overpack      | 1.9   |   |
|                    | 30 0185 0175      |                   | 3.7   |   |
| RF 131A<br>RF 231A | 20 0170 0528      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                    | 20 0170 0502      |                   | 3.7   |   |
|                    | 20 0170 0568      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0542      |                   | 3.7   |   |
|                    | 20 0170 0041      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag  |
| RF 131B<br>RF 231B | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement   |
|                    | 20 0000 0000      |                   | 3.7   |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |   |
|                    | 20 0000 0000      |                   | 3.7   |   |
| RF 131D<br>RF 231D | 20 0000 0000      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement in a pipe overpack  |
|                    | 20 0000 0000      |                   | 3.7   |   |
| RF 131E<br>RF 231E | 20 0170 0179      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                    | 20 0170 0153      |                   | 3.7   |   |
|                    | 20 0170 0219      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0193      |                   | 3.7   |   |
|                    | 20 0170 0079      | SWB               | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RF 131F<br>RF 231F | 20 0170 0140      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags |
|                    | 20 0170 0114      |                   | 3.7   |  |
|                    | 20 0170 0180      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0154      |                   | 3.7   |  |
|                    | 20 0170 0034      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag          |
| RF 131H<br>RF 231H | 20 0170 0220      | SWB               | 3.7   | Maximum of 2 plastic bag layers, one of which is a liner bag           |
| RF 131I<br>RF 231I | 20 0170 0152      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0126      |                   | 3.7   |  |
|                    | 20 0170 0192      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0166      |                   | 3.7   |  |
|                    | 20 0170 0052      | SWB               | 3.7   |  |
| RF 131K<br>RF 231K | 20 0170 0062      | SWB               | 3.7   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag  |
| RF 131N<br>RF 231N | 20 0170 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag           |
|                    | 20 0170 0481      |                   | 3.7   |  |
|                    | 20 0170 0546      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0521      |                   | 3.7   |  |
|                    | 20 0170 0399      | SWB               | 3.7   |  |
| RF 131T<br>RF 231T | 20 0170 0043      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| RF 132A<br>RF 232A | 10 0130 0190      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                    | 10 0130 0154      |                   | 3.7  |  |
|                    | 10 0130 0250      | SWB Overpack      | 1.9  |  |
|                    | 10 0130 0215      |                   | 3.7  |  |
| RF 132D<br>RF 232D | 10 0130 0175      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction   |
| RF 132J<br>RF 232J | 10 0130 0257      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                    | 10 0130 0221      |                   | 3.7  |  |
|                    | 10 0130 0318      | SWB Overpack      | 1.9  |  |
|                    | 10 0130 0282      |                   | 3.7  |  |
| RF 132K<br>RF 232K | 10 0130 0232      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                    |
|                    | 10 0130 0197      |                   | 3.7  |  |
|                    | 10 0130 0293      | SWB Overpack      | 1.9  |  |
|                    | 10 0130 0257      |                   | 3.7  |  |
| RF 132P<br>RF 232P | 10 0130 0151      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags punctured with a minimum 0.3-inch diameter hole  |
|                    | 10 0130 0115      |                   | 3.7  |  |
|                    | 10 0130 0211      | SWB Overpack      | 1.9  |  |
|                    | 10 0130 0176      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 132Q<br>RF 232Q   | 10 0130 0168      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag                         |
|                      | 10 0130 0133      |                   | 3.7   |  |
|                      | 10 0130 0229      | SWB Overpack      | 1.9   |  |
|                      | 10 0130 0193      |                   | 3.7   |  |
| RF 132QA<br>RF 232QA | 10 0130 0166      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag, and no rigid liner lid |
|                      | 10 0130 0131      |                   | 3.7   |  |
|                      | 10 0130 0227      | SWB Overpack      | 1.9   |  |
|                      | 10 0130 0191      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RH 111A<br>RH 211A | 10 0130 0175      | Pipe Overpack     | 3.7   | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack (slip lid metal can does not provide resistance to gas release). |
| RH 111B<br>RH 211B | 10 0130 0111      | Drum              | 3.7   | No layers of confinement.  |
| RH 111D<br>RH 211D | 10 0130 0046      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag.  |
| RH 112A<br>RH 212A | 40 9999 0485      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags  |
|                    | 40 9999 0459      |                   | 3.7   |  |
|                    | 40 9999 0525      | SWB Overpack      | 1.9   |  |
|                    | 40 9999 0499      |                   | 3.7   |  |
| RH 112B<br>RH 212B | 40 9999 0145      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags   |
|                    | 40 9999 0120      |                   | 3.7   |  |
|                    | 40 9999 0185      | SWB Overpack      | 1.9   |  |
|                    | 40 9999 0159      |                   | 3.7   |  |
| RH 114A<br>RH 214A | 10 0040 0648      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                    | 10 0040 0613      |                   | 3.7   |  |
|                    | 10 0040 0709      | SWB Overpack      | 1.9   |  |
|                    | 10 0040 0673      |                   | 3.7   |  |
| RH 114B<br>RH 214B | 10 0040 0182      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 10 0040 0147      |                   | 3.7   |  |
| RH 114C<br>RH 214C | 10 0040 0173      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags   |
|                    | 10 0040 0137      |                   | 3.7   |  |
| RH 114D<br>RH 214D | 10 0040 0173      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags   |
|                    | 10 0040 0137      |                   | 3.7   |  |
|                    | 10 0040 0233      | SWB Overpack      | 1.9   |  |
|                    | 10 0040 0198      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RH 117A<br>RH 217A | 20 0000 0000      | Drum              | 3.7   | Metal waste in 55-gallon drum with no rigid liner.   |
| RH 117B<br>RH 217B | 20 0170 0101      | Drum              | 3.7   | Metal waste in 55-gallon drum with rigid liner.  |
| RH 117C<br>RH 217C | 20 0000 0000      | Drum              | 3.7   | Metal waste in 55-gallon drum with no rigid liner, overpacked in 85-gallon drum.   |
| RH 117D<br>RH 217D | 20 0170 0141      | Drum              | 3.7   | Metal waste in 55-gallon drum with rigid liner, overpacked in 85-gallon drum.  |
| RH 117E<br>RH 217E | 20 0000 0000      | Drum              | 3.7   | Metal can within a maximum of 4 filtered plastic bag layers, all of which are inner bags (slip lid metal can does not provide resistance to gas release).                      |
| RH 117F<br>RH 217F | 20 0000 0000      | Pipe Overpack     | 3.7   | Metal can within a maximum of 4 filtered plastic bag layers, all of which are inner bags, in a pipe component (slip lid metal can does not provide resistance to gas release). |
| RH 122A<br>RH 222A | 20 0000 0000      | Pipe Overpack     | 3.7   | Metal can within a maximum of 2 filtered plastic bag layers, all of which are inner bags (slip lid metal can does not provide resistance to gas release).                      |
| RH 123A<br>RH 223A | 30 0340 0686      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag   |
|                    | 30 0340 0660      |                   | 3.7   |  |
|                    | 30 0340 0725      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0700      |                   | 3.7   |  |
| RH 125A<br>RH 225A | 30 0340 0127      | Drum              | 1.9   | No layers of confinement   |
|                    | 30 0340 0101      |                   | 3.7   |  |
|                    | 30 0340 0166      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0141      |                   | 3.7   |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| RH 125B<br>RH 225B | 30 0340 0306      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag         |
|                    | 30 0340 0280      |                   | 3.7   |   |
|                    | 30 0340 0346      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0320      |                   | 3.7   |   |
|                    | 30 0340 0208      | SWB               | 3.7   |   |
| RH 125C<br>RH 225C | 30 0340 0148      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 30 0340 0122      |                   | 3.7   |   |
|                    | 30 0340 0188      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0162      |                   | 3.7   |   |
|                    | 30 0340 0041      | SWB               | 3.7   |   |
| RH 125D<br>RH 225D | 30 0340 0485      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags |
|                    | 30 0340 0459      |                   | 3.7   |   |
|                    | 30 0340 0525      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0499      |                   | 3.7   |   |
|                    | 30 0340 0387      | SWB               | 3.7   |   |
| RH 125E<br>RH 225E | 30 0340 0327      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0302      |                   | 3.7   |   |
|                    | 30 0340 0367      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0341      |                   | 3.7   |   |
|                    | 30 0340 0220      | SWB               | 3.7   |   |
| RH 125F<br>RH 225F | 30 0340 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0481      |                   | 3.7   |   |
|                    | 30 0340 0546      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0521      |                   | 3.7   |   |
|                    | 30 0340 0399      | SWB               | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| RH 125G<br>RH 225G | 30 0340 0686      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0660      |                   | 3.7   |   |
|                    | 30 0340 0725      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0700      |                   | 3.7   |   |
|                    | 30 0340 0579      | SWB               | 3.7   |   |
| RH 125H<br>RH 225H | 30 0340 0865      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0839      |                   | 3.7   |   |
|                    | 30 0340 0905      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0879      |                   | 3.7   |   |
|                    | 30 0340 0758      | SWB               | 3.7   |   |
| RH 125I<br>RH 225I | 30 0340 1044      | Drum              | 1.9   | Maximum of 6 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 1018      |                   | 3.7   |   |
|                    | 30 0340 1084      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 1058      |                   | 3.7   |   |
|                    | 30 0340 0937      | SWB               | 3.7   |   |
| RH 125J<br>RH 225J | 30 0340 0128      | Drum              | 3.7   | No layers of confinement. Filtered inner lid on double-lid drums.                                     |
|                    | 30 0340 0168      | SWB Overpack      | 3.7   |   |
| RH 125K<br>RH 225K | 30 0340 0149      | Drum              | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag. Filtered inner lid on double-lid drums.         |
|                    | 30 0340 0189      | SWB Overpack      | 3.7   |   |
| RH 125L<br>RH 225L | 30 0340 0307      | Drum              | 3.7   | Maximum of 1 plastic bag layer, which is an inner bag. Filtered inner lid on double-lid drums.        |
|                    | 30 0340 0347      | SWB Overpack      | 3.7   |   |
| RH 125M<br>RH 225M | 30 0340 0329      | Drum              | 3.7   | Maximum of 2 plastic bag layers, one of which is a liner bag. Filtered inner lid on double-lid drums. |
|                    | 30 0340 0368      | SWB Overpack      | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| RH 125N<br>RH 225N | 30 0340 0486      | Drum              | 3.7  | Maximum of 2 plastic bag layers, both of which are inner bags. Filtered inner lid on double-lid drums. |
|                    | 30 0340 0526      | SWB Overpack      | 3.7  |  |
| RH 125P<br>RH 225P | 30 0340 0508      | Drum              | 3.7  | Maximum of 3 plastic bag layers, one of which is a liner bag. Filtered inner lid on double-lid drums.  |
|                    | 30 0340 0548      | SWB Overpack      | 3.7  |  |
| RH 125Q<br>RH 225Q | 30 0340 0666      | Drum              | 3.7  | Maximum of 3 plastic bag layers, all of which are inner bags. Filtered inner lid on double-lid drums.  |
|                    | 30 0340 0705      | SWB Overpack      | 3.7  |  |
| RH 125R<br>RH 225R | 30 0340 0687      | Drum              | 3.7  | Maximum of 4 plastic bag layers, one of which is a liner bag. Filtered inner lid on double-lid drums.  |
|                    | 30 0340 0727      | SWB Overpack      | 3.7  |  |
| RH 125S<br>RH 225S | 30 0340 0664      | Drum              | 1.9  | Maximum of 3 plastic bag layers, which are inner bags  |
|                    | 30 0340 0639      |                   | 3.7  |  |
|                    | 30 0340 0704      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0678      |                   | 3.7  |  |
|                    | 30 0340 0566      | SWB               | 3.7  |  |
| RH 125T<br>RH 225T | 30 0340 0843      | Drum              | 1.9  | Maximum of 4 plastic bag layers, which are inner bags  |
|                    | 30 0340 0818      |                   | 3.7  |  |
|                    | 30 0340 0883      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0858      |                   | 3.7  |  |
|                    | 30 0340 0745      | SWB               | 3.7  |  |
| RH 125U<br>RH 225U | 30 0340 1023      | Drum              | 1.9  | Maximum of 5 plastic bag layers, which are inner bags  |
|                    | 30 0340 0997      |                   | 3.7  |  |
|                    | 30 0340 1062      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 1037      |                   | 3.7  |  |
|                    | 30 0340 0924      | SWB               | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RH 125V<br>RH 225V | 30 0340 1202      | Drum              | 1.9   | Maximum of 6 plastic bag layers, which are inner bags  |
|                    | 30 0340 1176      |                   | 3.7   |  |
|                    | 30 0340 1242      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 1216      |                   | 3.7   |  |
|                    | 30 0340 1104      | SWB               | 3.7   |  |
| RH 125W<br>RH 225W | 30 0340 0691      | Drum              | 1.9   | Maximum of 3 plastic bag layers, which are inner bags. Filtered inner lid on double-lid drums. |
|                    | 30 0340 0666      |                   | 3.7   |  |
|                    | 30 0340 0731      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0705      |                   | 3.7   |  |
| RH 125X<br>RH 225X | 30 0340 0870      | Drum              | 1.9   | Maximum of 4 plastic bag layers, which are inner bags. Filtered inner lid on double-lid drums. |
|                    | 30 0340 0845      |                   | 3.7   |  |
|                    | 30 0340 0910      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0885      |                   | 3.7   |  |
| RH 125Y<br>RH 225Y | 30 0340 1050      | Drum              | 1.9   | Maximum of 5 plastic bag layers, which are inner bags. Filtered inner lid on double-lid drums. |
|                    | 30 0340 1024      |                   | 3.7   |  |
|                    | 30 0340 1089      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 1064      |                   | 3.7   |  |
| RH 125Z<br>RH 225Z | 30 0340 1229      | Drum              | 1.9   | Maximum of 6 plastic bag layers, which are inner bags. Filtered inner lid on double-lid drums. |
|                    | 30 0340 1203      |                   | 3.7   |  |
|                    | 30 0340 1269      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 1243      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RH 125AA<br>RH 225AA | 30 0340 0145      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags.  |
|                      | 30 0340 0120      |                   | 3.7  |  |
|                      | 30 0340 0047      | SWB               | 3.7  |  |
| RH 125AB<br>RH 225AB | 30 0340 0155      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, which are inner bags.  |
|                      | 30 0340 0129      |                   | 3.7  |  |
|                      | 30 0340 0056      | SWB               | 3.7  |  |
| RH 125AC<br>RH 225AC | 30 0340 0164      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, which are inner bags.  |
|                      | 30 0340 0138      |                   | 3.7  |  |
|                      | 30 0340 0066      | SWB               | 3.7  |  |
| RH 125AD<br>RH 225AD | 30 0340 0101      | Drum              | 3.7  | Metal can as innermost layer (slip lid metal can does not provide resistance to gas release).  |
| RH 125AE<br>RH 225AE | 30 0340 0120      | Drum              | 3.7  | Metal can within a maximum of 2 filtered plastic bag layers, both of which are inner bags (slip lid metal can does not provide resistance to gas release). |
| RH 125AF<br>RH 225AF | 30 0340 0129      | Drum              | 3.7  | Metal can within a maximum of 3 filtered plastic bag layers, all of which are inner bags (slip lid metal can does not provide resistance to gas release).  |
| RH 125AG<br>RH 225AG | 30 0340 0138      | Drum              | 3.7  | Metal can within a maximum of 4 filtered plastic bag layers, all of which are inner bags (slip lid metal can does not provide resistance to gas release).  |
| RH 125AH<br>RH 225AH | 30 0340 0128      | Pipe Overpack     | 3.7  | Metal can within a pipe component (slip lid metal can does not provide resistance to gas release).   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RH 125AI<br>RH 225AI | 30 0340 0147      | Pipe Overpack     | 3.7   | Metal can within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe component (slip lid metal can does not provide resistance to gas release). |
| RH 125AJ<br>RH 225AJ | 30 0340 0156      | Pipe Overpack     | 3.7   | Metal can within a maximum of 3 filtered plastic bag layers, all of which are inner bags, in a pipe component (slip lid metal can does not provide resistance to gas release).  |
| RH 125AK<br>RH 225AK | 30 0340 0165      | Pipe Overpack     | 3.7   | Metal can within a maximum of 4 filtered plastic bag layers, all of which are inner bags, in a pipe component (slip lid metal can does not provide resistance to gas release).  |
| RH 125AL<br>RH 225AL | 30 0340 1995      | Drum              | 3.7   | Maximum of 6 plastic bag layers, one of which is a heat-sealed bag and one of which is a liner bag. Rigid drum liner is not present.  |
| RH 125AM<br>RH 225AM | 30 0340 1975      | Drum              | 3.7   | Maximum of 5 plastic bag layers, four of which are inner bags and one of which is a heat-sealed bag.  |
| RH 125AN<br>RH 225AN | 30 0340 0124      | Drum              | 3.7   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag. Rigid drum liner is not present.   |
|                      | 30 0340 0164      | SWB Overpack      | 3.7   |   |
|                      | 30 0340 0052      | SWB (2 filters)   | 3.7   |   |
|                      | 30 0340 0046      | SWB (4 filters)   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RH 125AP<br>RH 225AP | 30 0340 0134      | Drum              | 3.7   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag. Rigid drum liner is not present.  |
|                      | 30 0340 0173      | SWB Overpack      | 3.7   |  |
|                      | 30 0340 0062      | SWB (2 filters)   | 3.7   |  |
|                      | 30 0340 0055      | SWB (4 filters)   | 3.7   |  |
| RH 125AQ<br>RH 225AQ | 30 0340 0106      | Drum              | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag. Rigid drum liner is not present.  |
|                      | 30 0340 0145      | SWB Overpack      | 3.7   |  |
|                      | 30 0340 0034      | SWB (2 filters)   | 3.7   |  |
|                      | 30 0340 0027      | SWB (4 filters)   | 3.7   |  |
| RH 125AR<br>RH 225AR | 30 0340 0321      | Drum              | 3.7   | Maximum of 3 plastic bag layers, one of which is an inner bag. Rigid drum liner is not present.  |
|                      | 30 0340 0361      | SWB Overpack      | 3.7   |  |
| RH 125AS<br>RH 225AS | 30 0340 0122      | Drum              | 3.7   | Maximum of 3 filtered plastic bag layers, one of which is an inner bag. Rigid drum liner is not present.   |
|                      | 30 0340 0162      | SWB Overpack      | 3.7   |  |
| RH 130A<br>RH 230A   | 30 0034 0101      | Drum              | 3.7   | Metal can as innermost layer (slip lid metal can does not provide resistance to gas release).  |
| RH 130B<br>RH 230B   | 30 0034 0120      | Drum              | 3.7   | Metal can within a maximum of 2 filtered plastic bag layers, both of which are inner bags (slip lid metal can does not provide resistance to gas release). |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| RH 130C<br>RH 230C | 30 0034 0129      | Drum              | 3.7  | Metal can within a maximum of 3 filtered plastic bag layers, all of which are inner bags (slip lid metal can does not provide resistance to gas release).                       |
| RH 130D<br>RH 230D | 30 0034 0138      | Drum              | 3.7  | Metal can within a maximum of 4 filtered plastic bag layers, all of which are inner bags (slip lid metal can does not provide resistance to gas release).                       |
| RH 130E<br>RH 230E | 30 0034 0128      | Pipe Overpack     | 3.7  | Metal can within a pipe component (slip lid metal can does not provide resistance to gas release).  |
| RH 130F<br>RH 230F | 30 0034 0147      | Pipe Overpack     | 3.7  | Metal can within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe component (slip lid metal can does not provide resistance to gas release). |
| RH 130G<br>RH 230G | 30 0034 0156      | Pipe Overpack     | 3.7  | Metal can within a maximum of 3 filtered plastic bag layers, all of which are inner bags, in a pipe component (slip lid metal can does not provide resistance to gas release).  |
| RH 130H<br>RH 230H | 30 0034 0165      | Pipe Overpack     | 3.7  | Metal can within a maximum of 4 filtered plastic bag layers, all of which are inner bags, in a pipe component (slip lid metal can does not provide resistance to gas release).  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement    |
|--------------|-------------------|-------------------|---|--------------------------|
| SL 111       | 10 0160 0147      | Drum              | 1.9   | No layers of confinement |
| SL 211       | 10 0160 0111      |                   | 3.7   |                          |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-----------------------------|---|---|
| SQ 111A<br>SQ 211A | 10 0160 0147      | Drum                        | 1.9   | No layers of confinement                                      |
|                    | 10 0160 0111      |                             | 3.7   |   |
|                    | 10 0160 0207      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 10 0160 0172      |                             | 3.7   |   |
|                    | 10 0160 0034      | SWB                         | 3.7   |   |
| SQ 111B<br>SQ 211B | 10 0160 0168      | Drum                        | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 10 0160 0133      |                             | 3.7   |   |
|                    | 10 0160 0229      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 10 0160 0193      |                             | 3.7   |   |
|                    | 10 0160 0046      | SWB                         | 3.7   |   |
| SQ 111C<br>SQ 211C | 10 0160 0190      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags |
|                    | 10 0160 0154      |                             | 3.7   |   |
|                    | 10 0160 0250      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 10 0160 0215      |                             | 3.7   |   |
|                    | 10 0160 0059      | SWB                         | 3.7   |   |
| SQ 111D<br>SQ 211D | 10 0160 0648      | Drum                        | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 10 0160 0613      |                             | 3.7   |   |
|                    | 10 0160 0709      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 10 0160 0673      |                             | 3.7   |   |
|                    | 10 0160 0526      | SWB                         | 3.7   |   |
| SQ 112A<br>SQ 212A | 40 9999 0127      | Drum                        | 1.9   | No layers of confinement                                      |
|                    | 40 9999 0101      |                             | 3.7   |   |
|                    | 40 9999 0166      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 40 9999 0141      |                             | 3.7   |   |
|                    | 40 9999 0028      | SWB                         | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement   |
|--------------------|-------------------|-----------------------------|--|---|
| SQ 112B<br>SQ 212B | 40 9999 0148      | Drum                        | 1.9  | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 40 9999 0122      |                             | 3.7  |   |
|                    | 40 9999 0188      | SWB/85-Gallon Drum Overpack | 1.9  |   |
|                    | 40 9999 0162      |                             | 3.7  |   |
|                    | 40 9999 0041      | SWB                         | 3.7  |   |
| SQ 112C<br>SQ 212C | 40 9999 0169      | Drum                        | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags |
|                    | 40 9999 0144      |                             | 3.7  |   |
|                    | 40 9999 0209      | SWB/85-Gallon Drum Overpack | 1.9  |   |
|                    | 40 9999 0184      |                             | 3.7  |   |
|                    | 40 9999 0053      | SWB                         | 3.7  |   |
| SQ 112D<br>SQ 212D | 40 9999 0506      | Drum                        | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 40 9999 0481      |                             | 3.7  |   |
|                    | 40 9999 0546      | SWB/85-Gallon Drum Overpack | 1.9  |   |
|                    | 40 9999 0521      |                             | 3.7  |   |
|                    | 40 9999 0399      | SWB                         | 3.7  |   |
| SQ 114A<br>SQ 214A | 10 0040 0147      | Drum                        | 1.9  | No layers of confinement                                      |
|                    | 10 0040 0111      |                             | 3.7  |   |
|                    | 10 0040 0207      | SWB/85-Gallon Drum Overpack | 1.9  |   |
|                    | 10 0040 0172      |                             | 3.7  |   |
|                    | 10 0040 0034      | SWB                         | 3.7  |   |
| SQ 114B<br>SQ 214B | 10 0040 0168      | Drum                        | 1.9  | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 10 0040 0133      |                             | 3.7  |   |
|                    | 10 0040 0229      | SWB/85-Gallon Drum Overpack | 1.9  |   |
|                    | 10 0040 0193      |                             | 3.7  |   |
|                    | 10 0040 0046      | SWB                         | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-----------------------------|---|---|
| SQ 114C<br>SQ 214C | 10 0040 0190      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags |
|                    | 10 0040 0154      |                             | 3.7   |   |
|                    | 10 0040 0250      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 10 0040 0215      |                             | 3.7   |   |
|                    | 10 0040 0059      | SWB                         | 3.7   |   |
| SQ 114D<br>SQ 214D | 10 0040 0648      | Drum                        | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 10 0040 0613      |                             | 3.7   |   |
|                    | 10 0040 0709      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 10 0040 0673      |                             | 3.7   |   |
|                    | 10 0040 0526      | SWB                         | 3.7   |   |
| SQ 120A<br>SQ 220A | 20 0000 0000      | Drum                        | 1.9   | Metal can as innermost layer of confinement                   |
|                    | 20 0000 0000      |                             | 3.7   |   |
|                    | 20 0000 0000      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 20 0000 0000      |                             | 3.7   |   |
|                    | 20 0000 0000      | SWB                         | 3.7   |   |
|                    | 20 0000 0000      | Direct Load TDOP            | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-----------------------------|---|---|
| SQ 121A<br>SQ 221A   | 30 0340 0127      | Drum                        | 1.9   | No layers of confinement  |
|                      | 30 0340 0101      |                             | 3.7   |   |
|                      | 30 0340 0166      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                      | 30 0340 0141      |                             | 3.7   |   |
|                      | 30 0340 0028      | SWB                         | 3.7   |   |
|                      | 30 0340 0013      | Direct Load TDOP            | 3.7   |   |
| SQ 121AA<br>SQ 221AA | 30 0340 0079      | Drum                        | 18.5  | No layers of confinement. Metal can with filter removed from bung hole is innermost layer of confinement, and the rigid liner lid in the 55-gallon drum is removed. |
| SQ 121B<br>SQ 221B   | 30 0340 0148      | Drum                        | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag  |
|                      | 30 0340 0122      |                             | 3.7   |   |
|                      | 30 0340 0188      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                      | 30 0340 0162      |                             | 3.7   |   |
|                      | 30 0340 0041      | SWB                         | 3.7   |   |
|                      | 30 0340 0026      | Direct Load TDOP            | 3.7   |   |
| SQ 121C<br>SQ 221C   | 30 0340 0327      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0302      |                             | 3.7   |   |
|                      | 30 0340 0367      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                      | 30 0340 0341      |                             | 3.7   |   |
|                      | 30 0340 0053      | SWB                         | 3.7   | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                      | 30 0340 0038      | Direct Load TDOP            | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-----------------------------|---|--|
| SQ 121D<br>SQ 221D   | 30 0340 0506      | Drum                        | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0481      |                             | 3.7   |  |
|                      | 30 0340 0546      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                      | 30 0340 0521      |                             | 3.7   |  |
|                      | 30 0340 0233      | SWB                         | 3.7   | Maximum of 3 plastic bag layers, two of which are liner bags   |
|                      | 30 0340 0218      | Direct Load TDOP            | 3.7   |  |
| SQ 121DA<br>SQ 221DA | 30 0340 0457      | Drum                        | 18.5  | Maximum of 3 plastic bag layers, one of which is a liner bag, and no rigid liner in the 55-gallon drum |
| SQ 121E<br>SQ 221E   | 30 0340 0615      | Drum                        | 18.5  | Maximum of 3 plastic bag layers, which are inner bags, and no rigid liner in the 55-gallon drum        |
| SQ 122A<br>SQ 222A   | 20 0000 0000      | Drum                        | 1.9   | Metal can as innermost layer of confinement  |
|                      | 20 0000 0000      |                             | 3.7   |  |
|                      | 20 0000 0000      | SWB/85-Gallon Drum Overpack | 1.9   |  |
|                      | 20 0000 0000      |                             | 3.7   |  |
|                      | 20 0000 0000      | SWB                         | 3.7   |  |
|                      | 20 0000 0000      | Direct Load TDOP            | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-----------------------------|---|---|
| SQ 122B<br>SQ 222B | 20 0170 0148      | Drum                        | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 20 0170 0122      |                             | 3.7   |   |
|                    | 20 0170 0188      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 20 0170 0162      |                             | 3.7   |   |
|                    | 20 0170 0041      | SWB                         | 3.7   |   |
|                    | 20 0170 0026      | Direct Load TDOP            | 3.7   |   |
| SQ 122C<br>SQ 222C | 20 0170 0327      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0302      |                             | 3.7   |   |
|                    | 20 0170 0367      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 20 0170 0341      |                             | 3.7   |   |
|                    | 20 0170 0053      | SWB                         | 3.7   | Maximum of 2 plastic bag layers, both of which are liner bags |
|                    | 20 0170 0038      | Direct Load TDOP            | 3.7   |   |
| SQ 122D<br>SQ 222D | 20 0170 0506      | Drum                        | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0481      |                             | 3.7   |   |
|                    | 20 0170 0546      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 20 0170 0521      |                             | 3.7   |   |
|                    | 20 0170 0233      | SWB                         | 3.7   | Maximum of 3 plastic bag layers, two of which are liner bags  |
|                    | 20 0170 0218      | Direct Load TDOP            | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement   |
|--------------------|-------------------|-----------------------------|--|---|
| SQ 122E<br>SQ 222E | 20 0170 0127      | Drum                        | 1.9  | No layers of confinement  |
|                    | 20 0170 0101      |                             | 3.7  |   |
|                    | 20 0170 0166      | SWB/85-Gallon Drum Overpack | 1.9  |   |
|                    | 20 0170 0141      |                             | 3.7  |   |
|                    | 20 0170 0028      | SWB                         | 3.7  |   |
|                    | 20 0170 0013      | Direct Load TDOP            | 3.7  |   |
| SQ 125A<br>SQ 225A | 30 0340 0127      | Drum                        | 1.9  | No layers of confinement  |
|                    | 30 0340 0101      |                             | 3.7  |   |
|                    | 30 0340 0166      | SWB Overpack                | 1.9  |   |
|                    | 30 0340 0141      |                             | 3.7  |   |
|                    | 30 0340 0028      | SWB                         | 3.7  |   |
|                    | 30 0340 0013      | Direct Load TDOP            | 3.7  |   |
|                    | 30 0340 0128      | Pipe Overpack               | 3.7  | No layers of confinement in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
| SQ 125B<br>SQ 225B | 30 0340 0148      | Drum                        | 1.9  | Maximum of 1 plastic bag layer, which is a liner bag  |
|                    | 30 0340 0122      |                             | 3.7  |   |
|                    | 30 0340 0188      | SWB Overpack                | 1.9  |   |
|                    | 30 0340 0162      |                             | 3.7  |   |
|                    | 30 0340 0041      | SWB                         | 3.7  |   |
|                    | 30 0340 0026      | Direct Load TDOP            | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-----------------------------|---|---|
| SQ 125C<br>SQ 225C | 30 0340 0485      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags   |
|                    | 30 0340 0459      |                             | 3.7   |   |
|                    | 30 0340 0525      | SWB Overpack                | 1.9   |   |
|                    | 30 0340 0499      |                             | 3.7   |   |
|                    | 30 0340 0387      | SWB                         | 3.7   |   |
|                    | 30 0340 0372      | Direct Load TDOP            | 3.7   |   |
|                    | 30 0340 0486      | Pipe Overpack               | 3.7   | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| SQ 125D<br>SQ 225D | 30 0340 0506      | Drum                        | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0481      |                             | 3.7   |   |
|                    | 30 0340 0546      | SWB Overpack                | 1.9   |   |
|                    | 30 0340 0521      |                             | 3.7   |   |
|                    | 30 0340 0399      | SWB                         | 3.7   |   |
|                    | 30 0340 0384      | Direct Load TDOP            | 3.7   |   |
| SQ 126A<br>SQ 226A | 30 0340 0127      | Drum                        | 1.9   | No layers of confinement  |
|                    | 30 0340 0101      |                             | 3.7   |   |
|                    | 30 0340 0166      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 30 0340 0141      |                             | 3.7   |   |
|                    | 30 0340 0028      | SWB                         | 3.7   |   |
|                    | 30 0340 0013      | Direct Load TDOP            | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-----------------------------|---|---|
| SQ 126B<br>SQ 226B | 30 0340 0148      | Drum                        | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 30 0340 0122      |                             | 3.7   |   |
|                    | 30 0340 0188      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 30 0340 0162      |                             | 3.7   |   |
|                    | 30 0340 0041      | SWB                         | 3.7   |   |
|                    | 30 0340 0026      | Direct Load TDOP            | 3.7   |   |
| SQ 126C<br>SQ 226C | 30 0340 0327      | Drum                        | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0302      |                             | 3.7   |   |
|                    | 30 0340 0367      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 30 0340 0341      |                             | 3.7   |   |
|                    | 30 0340 0053      | SWB                         | 3.7   | Maximum of 2 plastic bag layers, both of which are liner bags |
|                    | 30 0340 0038      | Direct Load TDOP            | 3.7   |   |
| SQ 126D<br>SQ 226D | 30 0340 0506      | Drum                        | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0481      |                             | 3.7   |   |
|                    | 30 0340 0546      | SWB/85-Gallon Drum Overpack | 1.9   |   |
|                    | 30 0340 0521      |                             | 3.7   |   |
|                    | 30 0340 0233      | SWB                         | 3.7   | Maximum of 3 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0218      | Direct Load TDOP            | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| SQ 126E<br>SQ 226E | 30 0340 0128      | Pipe Overpack     | 3.7   | No layers of confinement in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                                       |
| SQ 126F<br>SQ 226F | 30 0340 0486      | Pipe Overpack     | 3.7   | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| SR 117A<br>SR 217A | 20 0000 0000      | SWB               | 3.7  | Metal container as innermost layer of confinement            |
| SR 122A<br>SR 222A | 20 0170 0506      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag |
|                    | 20 0170 0481      |                   | 3.7  |  |
|                    | 20 0170 0546      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0521      |                   | 3.7  |  |
|                    | 20 0170 0399      | SWB               | 3.7  |  |
|                    | 20 0170 0384      | Direct Load TDOP  | 3.7  |  |
| SR 122B<br>SR 222B | 20 0170 0686      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag |
|                    | 20 0170 0660      |                   | 3.7  |  |
|                    | 20 0170 0725      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0700      |                   | 3.7  |  |
|                    | 20 0170 0579      | SWB               | 3.7  |  |
|                    | 20 0170 0564      | Direct Load TDOP  | 3.7  |  |
| SR 122C<br>SR 222C | 20 0170 0865      | Drum              | 1.9  | Maximum of 5 plastic bag layers, one of which is a liner bag |
|                    | 20 0170 0839      |                   | 3.7  |  |
|                    | 20 0170 0905      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0879      |                   | 3.7  |  |
|                    | 20 0170 0758      | SWB               | 3.7  |  |
|                    | 20 0170 0743      | Direct Load TDOP  | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| SR 122D<br>SR 222D | 20 0170 0127      | Drum              | 1.9   | No layers of confinement                                     |
|                    | 20 0170 0101      |                   | 3.7   |  |
|                    | 20 0170 0166      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0141      |                   | 3.7   |  |
|                    | 20 0170 0028      | SWB               | 3.7   |  |
|                    | 20 0170 0013      | Direct Load TDOP  | 3.7   |  |
| SR 122E<br>SR 222E | 20 0170 0148      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag         |
|                    | 20 0170 0122      |                   | 3.7   |  |
|                    | 20 0170 0188      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0162      |                   | 3.7   |  |
|                    | 20 0170 0041      | SWB               | 3.7   |  |
|                    | 20 0170 0026      | Direct Load TDOP  | 3.7   |  |
| SR 122F<br>SR 222F | 20 0170 0327      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag |
|                    | 20 0170 0302      |                   | 3.7   |  |
|                    | 20 0170 0367      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0341      |                   | 3.7   |  |
|                    | 20 0170 0220      | SWB               | 3.7   |  |
|                    | 20 0170 0205      | Direct Load TDOP  | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| SR 122G<br>SR 222G | 20 0170 1044      | Drum              | 1.9   | Maximum of 6 plastic bag layers, one of which is a liner bag |
|                    | 20 0170 1018      |                   | 3.7   |  |
|                    | 20 0170 1084      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 1058      |                   | 3.7   |  |
|                    | 20 0170 0937      | SWB               | 3.7   |  |
|                    | 20 0170 0922      | Direct Load TDOP  | 3.7   |  |
| SR 122H<br>SR 222H | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement                  |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      | SWB               | 3.7   |  |
|                    | 20 0000 0000      | Direct Load TDOP  | 3.7   |  |
| SR 125A<br>SR 225A | 30 0340 0865      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0839      |                   | 3.7   |  |
|                    | 30 0340 0905      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0879      |                   | 3.7   |  |
|                    | 30 0340 0758      | SWB               | 3.7   |  |
|                    | 30 0340 0743      | Direct Load TDOP  | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| SR 125B<br>SR 225B | 30 0340 0127      | Drum              | 1.9   | No layers of confinement                                     |
|                    | 30 0340 0101      |                   | 3.7   |  |
|                    | 30 0340 0166      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0141      |                   | 3.7   |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |
|                    | 30 0340 0013      | Direct Load TDOP  | 3.7   |  |
| SR 125C<br>SR 225C | 30 0340 0148      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag         |
|                    | 30 0340 0122      |                   | 3.7   |  |
|                    | 30 0340 0188      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0162      |                   | 3.7   |  |
|                    | 30 0340 0041      | SWB               | 3.7   |  |
|                    | 30 0340 0026      | Direct Load TDOP  | 3.7   |  |
| SR 125D<br>SR 225D | 30 0340 0327      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0302      |                   | 3.7   |  |
|                    | 30 0340 0367      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0341      |                   | 3.7   |  |
|                    | 30 0340 0220      | SWB               | 3.7   |  |
|                    | 30 0340 0205      | Direct Load TDOP  | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2A (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR GENERAL CASE (60-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| SR 125E<br>SR 225E | 30 0340 0506      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0481      |                   | 3.7   |  |
|                    | 30 0340 0546      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0521      |                   | 3.7   |  |
|                    | 30 0340 0399      | SWB               | 3.7   |  |
|                    | 30 0340 0384      | Direct Load TDOP  | 3.7   |  |
| SR 125F<br>SR 225F | 30 0340 0686      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 0660      |                   | 3.7   |  |
|                    | 30 0340 0725      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0700      |                   | 3.7   |  |
|                    | 30 0340 0579      | SWB               | 3.7   |  |
|                    | 30 0340 0564      | Direct Load TDOP  | 3.7   |  |
| SR 125G<br>SR 225G | 30 0340 1044      | Drum              | 1.9   | Maximum of 6 plastic bag layers, one of which is a liner bag |
|                    | 30 0340 1018      |                   | 3.7   |  |
|                    | 30 0340 1084      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 1058      |                   | 3.7   |  |
|                    | 30 0340 0937      | SWB               | 3.7   |  |
|                    | 30 0340 0922      | Direct Load TDOP  | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2B**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 111A<br>LA 211A | 10 0130 0121      | Drum              | 1.9   | Maximum of one plastic bag layer, which is a liner bag  |
|                    | 10 0130 0085      |                   | 3.7   |   |
|                    | 10 0130 0055      |                   | 18.5  |   |
|                    | 10 0130 0191      | SWB Overpack      | 1.9   |   |
|                    | 10 0130 0155      |                   | 3.7   |   |
|                    | 10 0130 0125      |                   | 18.5  |   |
| LA 111B<br>LA 211B | 10 0130 0099      | Drum              | 1.9   | No layers of confinement  |
|                    | 10 0130 0064      |                   | 3.7   |   |
|                    | 10 0130 0034      |                   | 18.5  |   |
|                    | 10 0130 0169      | SWB Overpack      | 1.9   |   |
|                    | 10 0130 0134      |                   | 3.7   |   |
|                    | 10 0130 0104      |                   | 18.5  |   |
|                    | 10 0130 0024      | SWB               | 3.7   |   |
| LA 111G<br>LA 211G | 10 0130 0081      | SWB (2 filters)   | 3.7   | Maximum of 3 plastic bag layers, two of which are drum liner bags, and one of which is an SWB liner bag |
|                    | 10 0130 0072      | SWB (4 filters)   | 3.7   |   |
| LA 111H<br>LA 211H | 10 0130 0073      | SWB (2 filters)   | 3.7   | Maximum of 3 plastic bag layers, one of which is a drum liner bag, and two of which are SWB liner bags  |
|                    | 10 0130 0063      | SWB (4 filters)   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 112A<br>LA 212A | 40 9999 0437      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags |
|                    | 40 9999 0412      |                   | 3.7   |   |
|                    | 40 9999 0390      |                   | 18.5  |   |
|                    | 40 9999 0487      | SWB Overpack      | 1.9   |   |
|                    | 40 9999 0461      |                   | 3.7   |   |
|                    | 40 9999 0396      |                   | 18.5 <sup>b</sup>   |   |
| LA 114A<br>LA 214A | 10 0040 0142      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags |
|                    | 10 0040 0107      |                   | 3.7   |   |
|                    | 10 0040 0077      |                   | 18.5  |   |
|                    | 10 0040 0212      | SWB Overpack      | 1.9   |   |
|                    | 10 0040 0177      |                   | 3.7   |   |
|                    | 10 0040 0087      |                   | 18.5 <sup>b</sup>   |   |
| LA 114B<br>LA 214B | 10 0040 0121      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 10 0040 0085      |                   | 3.7   |   |
|                    | 10 0040 0055      |                   | 18.5  |   |
|                    | 10 0040 0191      | SWB Overpack      | 1.9   |   |
|                    | 10 0040 0155      |                   | 3.7   |   |
|                    | 10 0040 0065      |                   | 18.5 <sup>b</sup>   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| LA 114C<br>LA 214C | 10 0040 0099      | Drum              | 1.9  | No layers of confinement  |
|                    | 10 0040 0064      |                   | 3.7  |   |
|                    | 10 0040 0034      |                   | 18.5   |   |
|                    | 10 0040 0169      | SWB Overpack      | 1.9  |   |
|                    | 10 0040 0134      |                   | 3.7  |   |
|                    | 10 0040 0044      |                   | 18.5 <sup>b</sup>  |   |
| LA 114E<br>LA 214E | 10 0040 0341      | Pipe Overpack     | 3.7  | Waste is placed into a slip-top metal can. Can is placed into a maximum of one plastic bag layer, which is an inner bag. Bag is placed into a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/ mol fraction |
| LA 115A<br>LA 215A | 20 0000 0000      | Drum              | 1.9  | Metal can as innermost layer of confinement   |
|                    | 20 0000 0000      |                   | 3.7  |   |
|                    | 20 0000 0000      |                   | 18.5   |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9  |   |
|                    | 20 0000 0000      |                   | 3.7  |   |
|                    | 20 0000 0000      |                   | 18.5 <sup>b</sup>  |   |
| LA 115B<br>LA 215B | 20 0170 0063      | Drum              | 3.7  | Maximum of 1 filtered plastic bag layer, which is an inner bag  |
|                    | 20 0170 0041      |                   | 18.5   |   |
|                    | 20 0170 0112      | SWB Overpack      | 3.7  |   |
|                    | 20 0170 0047      |                   | 18.5 <sup>b</sup>  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 116A<br>LA 216A | 30 0340 0480      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags           |
|                    | 30 0340 0455      |                   | 3.7   |  |
|                    | 30 0340 0433      |                   | 18.5  |  |
|                    | 30 0340 0530      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0504      |                   | 3.7   |  |
|                    | 30 0340 0439      |                   | 18.5 <sup>b</sup>   |  |
| LA 116B<br>LA 216B | 30 0340 0098      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags |
|                    | 30 0340 0072      |                   | 3.7   |  |
|                    | 30 0340 0050      |                   | 18.5  |  |
| LA 116C<br>LA 216C | 30 0340 0258      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag                  |
|                    | 30 0340 0233      |                   | 3.7   |  |
|                    | 30 0340 0211      |                   | 18.5  |  |
|                    | 30 0340 0307      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0282      |                   | 3.7   |  |
|                    | 30 0340 0217      |                   | 18.5 <sup>b</sup>   |  |
|                    | 30 0340 0198      | SWB               | 3.7   |  |
|                    | 30 0340 0187      |                   | 18.5  |  |
|                    | 30 0340 0186      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0184      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 116D<br>LA 216D | 30 0340 0437      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags      |
|                    | 30 0340 0412      |                   | 3.7   |  |
|                    | 30 0340 0390      |                   | 18.5  |  |
|                    | 30 0340 0487      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0461      |                   | 3.7   |  |
|                    | 30 0340 0396      |                   | 18.5 <sup>b</sup>   |  |
| LA 116E<br>LA 216E | 30 0340 0088      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag     |
|                    | 30 0340 0063      |                   | 3.7   |  |
|                    | 30 0340 0041      |                   | 18.5  |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |
|                    | 30 0340 0017      |                   | 18.5  |  |
|                    | 30 0340 0016      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0014      |                   | 18.5  |  |
| LA 116F<br>LA 216F | 30 0340 0086      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a drum liner bag |
|                    | 30 0340 0060      |                   | 3.7   |  |
|                    | 30 0340 0038      |                   | 18.5  |  |
|                    | 30 0340 0026      | SWB               | 3.7   |  |
|                    | 30 0340 0015      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| LA 116G<br>LA 216G | 30 0340 0079      | Drum              | 1.9  | No layers of confinement                                     |
|                    | 30 0340 0053      |                   | 3.7  |  |
|                    | 30 0340 0032      |                   | 18.5   |  |
|                    | 30 0340 0128      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0103      |                   | 3.7  |  |
|                    | 30 0340 0038      |                   | 18.5 <sup>b</sup>  |  |
|                    | 30 0340 0019      | SWB               | 3.7  |  |
|                    | 30 0340 0008      |                   | 18.5   |  |
|                    | 30 0340 0007      | Direct Load TDOP  | 3.7  |  |
|                    | 30 0340 0004      |                   | 18.5   |  |
| LA 116H<br>LA 216H | 30 0340 0659      | Drum              | 1.9  | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0634      |                   | 3.7  |  |
|                    | 30 0340 0612      |                   | 18.5   |  |
|                    | 30 0340 0709      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0683      |                   | 3.7  |  |
|                    | 30 0340 0618      |                   | 18.5 <sup>b</sup>  |  |
| LA 116I<br>LA 216I | 30 0340 0813      | Drum              | 3.7  | Maximum of 6 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0791      |                   | 18.5   |  |
|                    | 30 0340 0862      | SWB Overpack      | 3.7  |  |
|                    | 30 0340 0797      |                   | 18.5 <sup>b</sup>  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| LA 116J<br>LA 216J | 30 0340 0439      | Pipe Overpack     | 3.7  | Maximum of 2 plastic bag layers, which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| LA 117A<br>LA 217A | 20 0170 0736      | SWB               | 3.7  | Maximum of 4 plastic bag layers, which are inner bags   |
|                    | 20 0170 0725      |                   | 18.5   |   |
| LA 117B<br>LA 217B | 20 0170 0258      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is an inner bag   |
|                    | 20 0170 0233      |                   | 3.7  |   |
|                    | 20 0170 0211      |                   | 18.5   |   |
|                    | 20 0170 0307      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0282      |                   | 3.7  |   |
|                    | 20 0170 0217      |                   | 18.5 <sup>b</sup>  |   |
|                    | 20 0170 0198      | SWB               | 3.7  |   |
|                    | 20 0170 0187      |                   | 18.5   |   |
|                    | 20 0170 0186      | Direct Load TDOP  | 3.7  |   |
|                    | 20 0170 0184      |                   | 18.5   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 117C<br>LA 217C | 20 0170 0088      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 20 0170 0063      |                   | 3.7   |  |
|                    | 20 0170 0041      |                   | 18.5  |  |
|                    | 20 0170 0028      | SWB               | 3.7   |  |
|                    | 20 0170 0017      |                   | 18.5  |  |
|                    | 20 0170 0016      | Direct Load TDOP  | 3.7   |  |
|                    | 20 0170 0014      |                   | 18.5  |  |
| LA 117D<br>LA 217D | 20 0170 0437      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags  |
|                    | 20 0170 0412      |                   | 3.7   |  |
|                    | 20 0170 0390      |                   | 18.5  |  |
|                    | 20 0170 0487      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0461      |                   | 3.7   |  |
|                    | 20 0170 0396      |                   | 18.5 <sup>b</sup>   |  |
|                    |                   |                   |   |  |
| LA 117E<br>LA 217E | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement                    |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      |                   | 18.5  |  |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      |                   | 18.5 <sup>b</sup>   |  |
|                    |                   |                   |   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).



**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 117F<br>LA 217F | 20 0170 0086      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a drum liner bag |
|                    | 20 0170 0060      |                   | 3.7   |  |
|                    | 20 0170 0038      |                   | 18.5  |  |
|                    | 20 0170 0026      | SWB               | 3.7   |  |
|                    | 20 0170 0015      |                   | 18.5  |  |
| LA 117G<br>LA 217G | 20 0170 0079      | Drum              | 1.9   | No layers of confinement   |
|                    | 20 0170 0053      |                   | 3.7   |  |
|                    | 20 0170 0032      |                   | 18.5  |  |
|                    | 20 0170 0128      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0103      |                   | 3.7   |  |
|                    | 20 0170 0038      |                   | 18.5 <sup>b</sup>   |  |
|                    | 20 0170 0019      | SWB               | 3.7   |  |
|                    | 20 0170 0008      |                   | 18.5  |  |
|                    | 20 0170 0007      | Direct Load TDOP  | 3.7   |  |
|                    | 20 0170 0004      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 117H<br>LA 217H | 20 0170 0659      | Drum              | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 20 0170 0634      |                   | 3.7   |  |
|                    | 20 0170 0612      |                   | 18.5  |  |
|                    | 20 0170 0709      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0683      |                   | 3.7   |  |
|                    | 20 0170 0618      |                   | 18.5 <sup>b</sup>   |  |
| LA 117I<br>LA 217I | 20 0170 0455      | Drum              | 3.7   | Maximum of 4 plastic bag layers, two of which are liner bags |
|                    | 20 0170 0433      |                   | 18.5  |  |
|                    | 20 0170 0504      | SWB Overpack      | 3.7   |  |
|                    | 20 0170 0439      |                   | 18.5 <sup>b</sup>   |  |
|                    | 20 0170 0402      | SWB               | 3.7   |  |
|                    | 20 0170 0392      |                   | 18.5  |  |
| LA 117J<br>LA 217J | 20 0170 0813      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags |
|                    | 20 0170 0791      |                   | 18.5  |  |
|                    | 20 0170 0862      | SWB Overpack      | 3.7   |  |
|                    | 20 0170 0797      |                   | 18.5 <sup>b</sup>   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| LA 118A<br>LA 218A | 20 0000 0000      | Drum              | 1.9  | Metal can as innermost layer of confinement                   |
|                    | 20 0000 0000      |                   | 3.7  |   |
|                    | 20 0000 0000      |                   | 18.5   |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9  |   |
|                    | 20 0000 0000      |                   | 3.7  |   |
|                    | 20 0000 0000      |                   | 18.5 <sup>b</sup>  |   |
| LA 118B<br>LA 218B | 20 0170 0258      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is an inner bag         |
|                    | 20 0170 0233      |                   | 3.7  |   |
|                    | 20 0170 0211      |                   | 18.5   |   |
|                    | 20 0170 0307      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0282      |                   | 3.7  |   |
|                    | 20 0170 0217      |                   | 18.5 <sup>b</sup>  |   |
|                    | 20 0170 0198      | SWB               | 3.7  |   |
|                    | 20 0170 0187      |                   | 18.5   |   |
|                    | 20 0170 0186      | Direct Load TDOP  | 3.7  |   |
|                    | 20 0170 0184      |                   | 18.5   |   |
| LA 118C<br>LA 218C | 20 0170 0086      | Drum              | 1.9  | Maximum of 1 filtered plastic bag layer, which is a liner bag |
|                    | 20 0170 0060      |                   | 3.7  |   |
|                    | 20 0170 0038      |                   | 18.5   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| LA 118D<br>LA 218D | 20 0170 0079      | Drum              | 1.9  | No layers of confinement                                     |
|                    | 20 0170 0053      |                   | 3.7  |  |
|                    | 20 0170 0032      |                   | 18.5   |  |
|                    | 20 0170 0128      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0103      |                   | 3.7  |  |
|                    | 20 0170 0038      |                   | 18.5 <sup>b</sup>  |  |
|                    | 20 0170 0019      | SWB               | 3.7  |  |
|                    | 20 0170 0008      |                   | 18.5   |  |
|                    | 20 0170 0007      | Direct Load TDOP  | 3.7  |  |
|                    | 20 0170 0004      |                   | 18.5   |  |
| LA 118E<br>LA 218E | 20 0170 0659      | Drum              | 1.9  | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 20 0170 0634      |                   | 3.7  |  |
|                    | 20 0170 0612      |                   | 18.5   |  |
|                    | 20 0170 0709      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0683      |                   | 3.7  |  |
|                    | 20 0170 0618      |                   | 18.5 <sup>b</sup>  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 118F<br>LA 218F | 20 0170 0086      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag, and no rigid liner in the 55-gallon drums |
|                    | 20 0170 0061      |                   | 3.7   |   |
|                    | 20 0170 0039      |                   | 18.5  |   |
|                    | 20 0170 0136      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0110      |                   | 3.7   |   |
|                    | 20 0170 0045      |                   | 18.5 <sup>b</sup>   |   |
| LA 118G<br>LA 218G | 20 0170 0813      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags  |
|                    | 20 0170 0791      |                   | 18.5  |   |
|                    | 20 0170 0862      | SWB Overpack      | 3.7   |   |
|                    | 20 0170 0797      |                   | 18.5 <sup>b</sup>   |   |
| LA 119A<br>LA 219A | 30 0340 0258      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag   |
|                    | 30 0340 0233      |                   | 3.7   |   |
|                    | 30 0340 0211      |                   | 18.5  |   |
|                    | 30 0340 0307      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0282      |                   | 3.7   |   |
|                    | 30 0340 0217      |                   | 18.5 <sup>b</sup>   |   |
|                    | 30 0340 0198      | SWB               | 3.7   |   |
|                    | 30 0340 0187      |                   | 18.5  |   |
|                    | 30 0340 0186      | Direct Load TDOP  | 3.7   |   |
|                    | 30 0340 0184      |                   | 18.5  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 119B<br>LA 219B | 30 0340 0088      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag     |
|                    | 30 0340 0063      |                   | 3.7   |  |
|                    | 30 0340 0041      |                   | 18.5  |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |
|                    | 30 0340 0017      |                   | 18.5  |  |
|                    | 30 0340 0016      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0014      |                   | 18.5  |  |
| LA 119C<br>LA 219C | 30 0340 0086      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a drum liner bag |
|                    | 30 0340 0060      |                   | 3.7   |  |
|                    | 30 0340 0038      |                   | 18.5  |  |
|                    | 30 0340 0026      | SWB               | 3.7   |  |
|                    | 30 0340 0015      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| LA 119D<br>LA 219D | 30 0340 0079      | Drum              | 1.9  | No layers of confinement                                     |
|                    | 30 0340 0053      |                   | 3.7  |  |
|                    | 30 0340 0032      |                   | 18.5   |  |
|                    | 30 0340 0128      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0103      |                   | 3.7  |  |
|                    | 30 0340 0038      |                   | 18.5 <sup>b</sup>  |  |
|                    | 30 0340 0019      | SWB               | 3.7  |  |
|                    | 30 0340 0008      |                   | 18.5   |  |
|                    | 30 0340 0007      | Direct Load TDOP  | 3.7  |  |
|                    | 30 0340 0004      |                   | 18.5   |  |
| LA 119E<br>LA 219E | 30 0340 0659      | Drum              | 1.9  | Maximum of 5 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0634      |                   | 3.7  |  |
|                    | 30 0340 0612      |                   | 18.5   |  |
|                    | 30 0340 0709      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0683      |                   | 3.7  |  |
|                    | 30 0340 0618      |                   | 18.5 <sup>b</sup>  |  |
| LA 119F<br>LA 219F | 30 0340 0813      | Drum              | 3.7  | Maximum of 6 plastic bag layers, two of which are liner bags |
|                    | 30 0340 0791      |                   | 18.5   |  |
|                    | 30 0340 0862      | SWB Overpack      | 3.7  |  |
|                    | 30 0340 0797      |                   | 18.5 <sup>b</sup>  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category            | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|------------------------------|-------------------|--|--|
| LA 120A<br>LA 220A | 20 0000 0000<br>20 0000 0000 | Pipe<br>Overpack  | 1.9<br>3.7   | Metal can as innermost layer of confinement                    |
| LA 122A<br>LA 222A | 20 0000 0000                 | Drum              | 1.9  | Metal can as innermost layer of confinement                    |
|                    | 20 0000 0000                 |                   | 3.7  |  |
|                    | 20 0000 0000                 |                   | 18.5   |  |
|                    | 20 0000 0000                 | SWB Overpack      | 1.9  |  |
|                    | 20 0000 0000                 |                   | 3.7  |  |
|                    | 20 0000 0000                 |                   | 18.5 <sup>b</sup>  |  |
|                    | 20 0000 0000                 | Pipe Overpack     | 1.9  |  |
|                    | 20 0000 0000                 |                   | 3.7  |  |
|                    | 20 0000 0000                 |                   | 18.5   |  |
| LA 122B<br>LA 222B | 20 0170 0088                 | Drum              | 1.9  | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 20 0170 0063                 |                   | 3.7  |  |
|                    | 20 0170 0041                 |                   | 18.5   |  |
|                    | 20 0170 0138                 | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0112                 |                   | 3.7  |  |
|                    | 20 0170 0047                 |                   | 18.5 <sup>b</sup>  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).



**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 122C<br>LA 222C | 20 0170 0063      | Drum              | 3.7   | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 20 0170 0041      |                   | 18.5  |  |
|                    | 20 0170 0028      | SWB               | 3.7   |  |
|                    | 20 0170 0017      |                   | 18.5  |  |
|                    | 20 0170 0016      | Direct Load TDOP  | 3.7   |  |
|                    | 20 0170 0014      |                   | 18.5  |  |
| LA 123A<br>LA 223A | 30 0340 0480      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                    | 30 0340 0455      |                   | 3.7   |  |
|                    | 30 0340 0433      |                   | 18.5  |  |
|                    | 30 0340 0530      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0504      |                   | 3.7   |  |
|                    | 30 0340 0439      |                   | 18.5 <sup>b\</sup>  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 123B<br>LA 223B | 30 0340 0258      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is an inner bag                  |
|                    | 30 0340 0233      |                   | 3.7   |  |
|                    | 30 0340 0211      |                   | 18.5  |  |
|                    | 30 0340 0307      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0282      |                   | 3.7   |  |
|                    | 30 0340 0217      |                   | 18.5 <sup>b</sup>   |  |
|                    | 30 0340 0198      | SWB               | 3.7   |  |
|                    | 30 0340 0187      |                   | 18.5  |  |
|                    | 30 0340 0186      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0184      |                   | 18.5  |  |
| LA 123C<br>LA 223C | 30 0340 0088      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is an inner bag         |
|                    | 30 0340 0063      |                   | 3.7   |  |
|                    | 30 0340 0041      |                   | 18.5  |  |
|                    | 30 0340 0028      | SWB               | 3.7   |  |
|                    | 30 0340 0017      |                   | 18.5  |  |
|                    | 30 0340 0016      | Direct Load TDOP  | 3.7   |  |
|                    | 30 0340 0014      |                   | 18.5  |  |
| LA 123D<br>LA 223D | 30 0340 0098      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags |
|                    | 30 0340 0072      |                   | 3.7   |  |
|                    | 30 0340 0050      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 123E<br>LA 223E | 30 0340 0086      | Drum              | 1.9   | Maximum of 1 filtered plastic bag layer, which is a liner bag |
|                    | 30 0340 0060      |                   | 3.7   |   |
|                    | 30 0340 0038      |                   | 18.5  |   |
| LA 123F<br>LA 223F | 30 0340 0079      | Drum              | 1.9   | No layers of confinement                                      |
|                    | 30 0340 0053      |                   | 3.7   |   |
|                    | 30 0340 0032      |                   | 18.5  |   |
|                    | 30 0340 0128      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0103      |                   | 3.7   |   |
|                    | 30 0340 0038      |                   | 18.5 <sup>b</sup>   |   |
|                    | 30 0340 0019      | SWB               | 3.7   |   |
|                    | 30 0340 0008      |                   | 18.5  |   |
|                    | 30 0340 0007      | Direct Load TDOP  | 3.7   |   |
|                    | 30 0340 0004      |                   | 18.5  |   |
| LA 123G<br>LA 223G | 30 0340 0659      | Drum              | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0634      |                   | 3.7   |   |
|                    | 30 0340 0612      |                   | 18.5  |   |
|                    | 30 0340 0709      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0683      |                   | 3.7   |   |
|                    | 30 0340 0618      |                   | 18.5 <sup>b</sup>   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| LA 123H<br>LA 223H | 30 0340 0813      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags   |
|                    | 30 0340 0791      |                   | 18.5  |  |
|                    | 30 0340 0862      | SWB Overpack      | 3.7   |  |
|                    | 30 0340 0797      |                   | 18.5 <sup>b</sup>   |  |
| LA 124A<br>LA 224A | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement                    |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      |                   | 18.5  |  |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      |                   | 18.5 <sup>b</sup>   |  |
| LA 124B<br>LA 224B | 20 0170 0063      | Drum              | 3.7   | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 20 0170 0041      |                   | 18.5  |  |
|                    | 20 0170 0028      | SWB               | 3.7   |  |
|                    | 20 0170 0017      |                   | 18.5  |  |
|                    | 20 0170 0016      | Direct Load TDOP  | 3.7   |  |
|                    | 20 0170 0014      |                   | 18.5  |  |
| LA 124C<br>LA 224C | 20 0000 0000      | Pipe Overpack     | 3.7   | Metal can as innermost layer of confinement in a pipe overpack |
| LA 125A<br>LA 225A | 30 0340 0031      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag           |
|                    | 30 0340 0021      |                   | 18.5  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| LA 125B<br>LA 225B | 30 0340 0258      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is an inner bag          |
|                    | 30 0340 0233      |                   | 3.7  |  |
|                    | 30 0340 0211      |                   | 18.5   |  |
|                    | 30 0340 0307      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0282      |                   | 3.7  |  |
|                    | 30 0340 0217      |                   | 18.5 <sup>b</sup>  |  |
|                    | 30 0340 0198      | SWB               | 3.7  |  |
|                    | 30 0340 0187      |                   | 18.5   |  |
|                    | 30 0340 0186      | Direct Load TDOP  | 3.7  |  |
|                    | 30 0340 0184      |                   | 18.5   |  |
| LA 125C<br>LA 225C | 30 0340 0088      | Drum              | 1.9  | Maximum of 1 filtered plastic bag layer, which is an inner bag |
|                    | 30 0340 0063      |                   | 3.7  |  |
|                    | 30 0340 0041      |                   | 18.5   |  |
|                    | 30 0340 0028      | SWB               | 3.7  |  |
|                    | 30 0340 0017      |                   | 18.5   |  |
|                    | 30 0340 0016      | Direct Load TDOP  | 3.7  |  |
|                    | 30 0340 0014      |                   | 18.5   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| LA 125D<br>LA 225D | 30 0340 0086      | Drum              | 1.9  | Maximum of 1 filtered plastic bag layer, which is a drum liner bag |
|                    | 30 0340 0060      |                   | 3.7  |  |
|                    | 30 0340 0038      |                   | 18.5   |  |
|                    | 30 0340 0026      | SWB               | 3.7  |  |
|                    | 30 0340 0015      |                   | 18.5   |  |
| LA 125E<br>LA 225E | 30 0340 0079      | Drum              | 1.9  | No layers of confinement   |
|                    | 30 0340 0053      |                   | 3.7  |  |
|                    | 30 0340 0032      |                   | 18.5   |  |
|                    | 30 0340 0128      | SWB Overpack      | 1.9  |  |
|                    | 30 0340 0103      |                   | 3.7  |  |
|                    | 30 0340 0038      |                   | 18.5 <sup>b</sup>  |  |
|                    | 30 0340 0019      | SWB               | 3.7  |  |
|                    | 30 0340 0008      |                   | 18.5   |  |
|                    | 30 0340 0007      | Direct Load TDOP  | 3.7  |  |
|                    | 30 0340 0004      |                   | 18.5   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| LA 125F<br>LA 225F | 30 0340 0659      | Drum              | 1.9   | Maximum of 5 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0634      |                   | 3.7   |   |
|                    | 30 0340 0612      |                   | 18.5  |   |
|                    | 30 0340 0709      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0683      |                   | 3.7   |   |
|                    | 30 0340 0618      |                   | 18.5 <sup>b</sup>   |   |
| LA 125G<br>LA 225G | 30 0340 0813      | Drum              | 3.7   | Maximum of 6 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0791      |                   | 18.5  |   |
|                    | 30 0340 0862      | SWB Overpack      | 3.7   |   |
|                    | 30 0340 0797      |                   | 18.5 <sup>b</sup>   |   |
| LA 125H<br>LA 225H | 30 0340 0439      | Pipe Overpack     | 3.7   | Maximum of 2 plastic bag layers, which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| LA 126A<br>LA 226A | 30 0340 0122      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                    | 30 0340 0096      |                   | 3.7   |   |
|                    | 30 0340 0075      |                   | 18.5  |   |
|                    | 30 0340 0171      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0145      |                   | 3.7   |   |
|                    | 30 0340 0081      |                   | 18.5 <sup>b</sup>   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of 18.5 x 10<sup>-6</sup> mol/s/mol fraction on the overpacking SWB).

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement                                |
|--------------------|-------------------|-------------------|---|--|
| LA 126B<br>LA 226B | 30 0340 0100      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag |
|                    | 30 0340 0075      |                   | 3.7   |  |
|                    | 30 0340 0053      |                   | 18.5  |  |
|                    | 30 0340 0150      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0124      |                   | 3.7   |  |
|                    | 30 0340 0059      |                   | 18.5 <sup>b</sup>   |  |
| LA 126C<br>LA 226C | 30 0340 0079      | Drum              | 1.9   | No layers of confinement                             |
|                    | 30 0340 0053      |                   | 3.7   |  |
|                    | 30 0340 0032      |                   | 18.5  |  |
|                    | 30 0340 0128      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0103      |                   | 3.7   |  |
|                    | 30 0340 0038      |                   | 18.5 <sup>b</sup>   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

<sup>b</sup> For these SWB overpack packaging configurations, the hydrogen diffusivity value is specified for the filters on both the primary and secondary payload containers (i.e., one filter with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the 55-gallon drum and a minimum of two filters with a hydrogen diffusivity value of  $18.5 \times 10^{-6}$  mol/s/mol fraction on the overpacking SWB).



**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| NT 111A<br>NT 211A | 10 0160 0099      | Drum              | 1.9   | No layers of confinement                                      |
|                    | 10 0160 0064      |                   | 3.7   |   |
|                    | 10 0160 0169      | SWB Overpack      | 1.9   |   |
|                    | 10 0160 0134      |                   | 3.7   |   |
| NT 116A<br>NT 216A | 30 0340 0437      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags |
|                    | 30 0340 0412      |                   | 3.7   |   |
|                    | 30 0340 0487      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0461      |                   | 3.7   |   |
| NT 119A<br>NT 219A | 30 0340 0100      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 30 0340 0075      |                   | 3.7   |   |
|                    | 30 0340 0150      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0124      |                   | 3.7   |   |
| NT 125A<br>NT 225A | 30 0340 0638      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0612      |                   | 3.7   |   |
|                    | 30 0340 0687      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0662      |                   | 3.7   |   |
| NT 125B<br>NT 225B | 30 0340 0100      | Drum              | 1.9   | Maximum of 1 plastic bag layer, which is a liner bag          |
|                    | 30 0340 0075      |                   | 3.7   |   |
|                    | 30 0340 0150      | SWB Overpack      | 1.9   |   |
|                    | 30 0340 0124      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 111A<br>RF 211A   | 10 0130 0142      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                      | 10 0130 0107      |                   | 3.7   |  |
|                      | 10 0130 0212      | SWB Overpack      | 1.9   |  |
|                      | 10 0130 0177      |                   | 3.7   |  |
|                      | 10 0130 0037      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag   |
| RF 111B<br>RF 211B   | 10 0130 0301      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is an inner bag, and one filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                                  |
| RF 111D<br>RF 211D   | 10 0130 0127      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction   |
| RF 111DF<br>RF 211DF | 10 0130 0198      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 10 0130 0162      |                   | 3.7   |  |
| RF 111E<br>RF 211E   | 10 0130 0144      | Drum              | 1.9   | Maximum of 4 filtered plastic bags layers, two of which are liner bags, and 2 metal cans, each of which are closed with a slip-top lid   |
|                      | 10 0130 0108      |                   | 3.7   |  |
|                      | 10 0130 0214      | SWB Overpack      | 1.9   |  |
|                      | 10 0130 0178      |                   | 3.7   |  |
| RF 111H<br>RF 211H   | 10 0130 0361      | Drum              | 1.9   | Maximum of 2 plastic bag layers, one of which is a liner bag   |
|                      | 10 0130 0325      |                   | 3.7   |  |
|                      | 10 0130 0431      | SWB Overpack      | 1.9   |  |
|                      | 10 0130 0395      |                   | 3.7   |  |
|                      | 10 0130 0276      | SWB               | 3.7   |  |
| RF 111J<br>RF 211J   | 10 0130 0209      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 10 0130 0174      |                   | 3.7   |  |
|                      | 10 0130 0279      | SWB Overpack      | 1.9   |  |
|                      | 10 0130 0244      |                   | 3.7   |  |
| RF 111K<br>RF 211K   | 10 0130 0185      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                          |
|                      | 10 0130 0149      |                   | 3.7   |  |
|                      | 10 0130 0255      | SWB Overpack      | 1.9   |  |
|                      | 10 0130 0219      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 111P<br>RF 211P   | 10 0130 0164      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 111PF<br>RF 211PF | 10 0130 0271      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 10 0130 0235      |                   | 3.7  |  |
| RF 112A<br>RF 212A   | 40 9999 0122      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                      | 40 9999 0096      |                   | 3.7  |  |
|                      | 40 9999 0171      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0145      |                   | 3.7  |  |
| RF 112B<br>RF 212B   | 40 9999 0459      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag, and one metal can, which is closed with a slip-top lid   |
|                      | 40 9999 0433      |                   | 3.7  |  |
|                      | 40 9999 0508      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0482      |                   | 3.7  |  |
| RF 112D<br>RF 212D   | 40 9999 0126      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 112DF<br>RF 212DF | 40 9999 0203      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 40 9999 0177      |                   | 3.7  |  |
| RF 112J<br>RF 212J   | 40 9999 0131      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction  |
|                      | 40 9999 0106      |                   | 3.7  |  |
|                      | 40 9999 0181      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0155      |                   | 3.7  |  |
| RF 112N<br>RF 212N   | 40 9999 0459      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 40 9999 0433      |                   | 3.7  |  |
|                      | 40 9999 0508      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0482      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RF 112O<br>RF 212O   | 40 9999 0053      | Drum              | 3.7   | No layers of confinement  |
|                      | 40 9999 0032      |                   | 18.5  |   |
|                      | 40 9999 0027      |                   | 92.5  |   |
|                      | 40 9999 0103      | SWB Overpack      | 3.7   |   |
|                      | 40 9999 0081      |                   | 18.5  |   |
|                      | 40 9999 0077      |                   | 92.5  |   |
| RF 112OA<br>RF 212OA | 40 9999 0051      | Drum              | 3.7   | No layers of confinement and no rigid liner lid   |
|                      | 40 9999 0030      |                   | 18.5  |   |
|                      | 40 9999 0025      |                   | 92.5  |   |
|                      | 40 9999 0101      | SWB Overpack      | 3.7   |   |
|                      | 40 9999 0079      |                   | 18.5  |   |
|                      | 40 9999 0075      |                   | 92.5  |   |
| RF 112P<br>RF 212P   | 40 9999 0057      | Drum              | 3.7   | Maximum of 2 plastic bag layers, both of which are liner bags, which are punctured with a minimum 0.3-inch hole                         |
|                      | 40 9999 0036      |                   | 18.5  |   |
|                      | 40 9999 0031      |                   | 92.5  |   |
|                      | 40 9999 0107      | SWB Overpack      | 3.7   |   |
|                      | 40 9999 0085      |                   | 18.5  |   |
|                      | 40 9999 0081      |                   | 92.5  |   |
| RF 112PA<br>RF 212PA | 40 9999 0055      | Drum              | 3.7   | Maximum of 2 plastic bag layers, both of which are liner bags, which are punctured with a minimum 0.3-inch hole, and no rigid liner lid |
|                      | 40 9999 0034      |                   | 18.5  |   |
|                      | 40 9999 0029      |                   | 92.5  |   |
|                      | 40 9999 0105      | SWB Overpack      | 3.7   |   |
|                      | 40 9999 0083      |                   | 18.5  |   |
|                      | 40 9999 0079      |                   | 92.5  |   |
| RF 112Q<br>RF 212Q   | 40 9999 0075      | Drum              | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag  |
|                      | 40 9999 0053      |                   | 18.5  |   |
|                      | 40 9999 0049      |                   | 92.5  |   |
|                      | 40 9999 0124      | SWB Overpack      | 3.7   |   |
|                      | 40 9999 0102      |                   | 18.5  |   |
|                      | 40 9999 0098      |                   | 92.5  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 112QA<br>RF 212QA | 40 9999 0073      | Drum              | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag, and no rigid liner lid   |
|                      | 40 9999 0051      |                   | 18.5   |  |
|                      | 40 9999 0047      |                   | 92.5   |  |
|                      | 40 9999 0122      | SWB Overpack      | 3.7  |  |
|                      | 40 9999 0100      |                   | 18.5   |  |
|                      | 40 9999 0096      |                   | 92.5   |  |
| RF 113A<br>RF 213A   | 40 9999 0122      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                      | 40 9999 0096      |                   | 3.7  |  |
|                      | 40 9999 0171      | SWB Overpack      | 1.9  |  |
|                      | 40 9999 0145      |                   | 3.7  |  |
| RF 114A<br>RF 214A   | 10 0040 0600      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 10 0040 0565      |                   | 3.7  |  |
|                      | 10 0040 0671      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0635      |                   | 3.7  |  |
| RF 114B<br>RF 214B   | 10 0040 0622      | Drum              | 1.9  | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 10 0040 0586      |                   | 3.7  |  |
|                      | 10 0040 0692      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0657      |                   | 3.7  |  |
| RF 114D<br>RF 214D   | 10 0040 0581      | Pipe Overpack     | 3.7  | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
| RF 114DF<br>RF 214DF | 10 0040 0652      | Pipe Overpack     | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe component   |
|                      | 10 0040 0616      |                   | 3.7  |  |
| RF 114E<br>RF 214E   | 10 0040 0144      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, two of which are liner bags  |
|                      | 10 0040 0108      |                   | 3.7  |  |
|                      | 10 0040 0214      | SWB Overpack      | 1.9  |  |
|                      | 10 0040 0178      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 114F<br>RF 214F   | 10 0040 0144      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, two of which are liner bags  |
|                      | 10 0040 0108      |                   | 3.7   |  |
|                      | 10 0040 0214      | SWB Overpack      | 1.9   |  |
|                      | 10 0040 0178      |                   | 3.7   |  |
| RF 114G<br>RF 214G   | 10 0040 0127      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction   |
| RF 114GF<br>RF 214GF | 10 0040 0198      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 10 0040 0162      |                   | 3.7   |  |
| RF 114J<br>RF 214J   | 10 0040 0219      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, two of which are liner bags, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 10 0040 0183      |                   | 3.7   |  |
|                      | 10 0040 0289      | SWB Overpack      | 1.9   |  |
|                      | 10 0040 0253      |                   | 3.7   |  |
| RF 114JF<br>RF 214JF | 10 0040 0290      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, two of which are liner bags, and 2 filtered metal cans   |
|                      | 10 0040 0254      |                   | 3.7   |  |
|                      | 10 0040 0360      | SWB Overpack      | 1.9   |  |
|                      | 10 0040 0324      |                   | 3.7   |  |
| RF 114K<br>RF 214K   | 10 0040 0142      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                      | 10 0040 0107      |                   | 3.7   |  |
|                      | 10 0040 0212      | SWB Overpack      | 1.9   |  |
|                      | 10 0040 0177      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 114L<br>RF 214L   | 10 0040 0118      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags   |
|                      | 10 0040 0082      |                   | 3.7   |  |
|                      | 10 0040 0188      | SWB Overpack      | 1.9   |  |
|                      | 10 0040 0153      |                   | 3.7   |  |
| RF 114P<br>RF 214P   | 10 0040 0164      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 114PF<br>RF 214PF | 10 0040 0271      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 10 0040 0235      |                   | 3.7   |  |
| RF 115A<br>RF 215A   | 20 0170 0480      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 20 0170 0455      |                   | 3.7   |  |
|                      | 20 0170 0530      | SWB Overpack      | 1.9   |  |
|                      | 20 0170 0504      |                   | 3.7   |  |
| RF 115B<br>RF 215B   | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement  |
|                      | 20 0000 0000      |                   | 3.7   |  |
|                      | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                      | 20 0000 0000      |                   | 3.7   |  |
| RF 115D<br>RF 215D   | 20 0000 0000      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement in a pipe overpack   |
|                      | 20 0000 0000      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| RF 115E<br>RF 215E | 20 0170 0131      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                    | 20 0170 0106      |                   | 3.7  |   |
|                    | 20 0170 0181      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0155      |                   | 3.7  |   |
| RF 115F<br>RF 215F | 20 0170 0092      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                    | 20 0170 0067      |                   | 3.7  |   |
|                    | 20 0170 0142      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0116      |                   | 3.7  |   |
| RF 115N<br>RF 215N | 20 0170 0459      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0433      |                   | 3.7  |   |
|                    | 20 0170 0508      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0482      |                   | 3.7  |   |
|                    | 20 0170 0390      | SWB               | 3.7  |   |
| RF 116A<br>RF 216A | 30 0340 0480      | Drum              | 1.9  | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                    | 30 0340 0455      |                   | 3.7  |   |
|                    | 30 0340 0530      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0504      |                   | 3.7  |   |
|                    | 30 0340 0031      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag  |
| RF 116C<br>RF 216C | 30 0340 0122      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                    | 30 0340 0096      |                   | 3.7  |   |
|                    | 30 0340 0171      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0145      |                   | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 116D<br>RF 216D   | 30 0340 0099      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| RF 116DF<br>RF 216DF | 30 0340 0150      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 30 0340 0125      |                   | 3.7   |  |
| RF 116E<br>RF 216E   | 30 0340 0131      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                  |
|                      | 30 0340 0106      |                   | 3.7   |  |
|                      | 30 0340 0181      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0155      |                   | 3.7   |  |
|                      | 30 0340 0070      | SWB               | 3.7   |  |
| RF 116EF<br>RF 216EF | 30 0340 0157      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can  |
|                      | 30 0340 0131      |                   | 3.7   |  |
|                      | 30 0340 0206      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0181      |                   | 3.7   |  |
|                      | 30 0340 0096      | SWB               | 3.7   |  |
| RF 116F<br>RF 216F   | 30 0340 0092      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags   |
|                      | 30 0340 0067      |                   | 3.7   |  |
|                      | 30 0340 0142      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0116      |                   | 3.7   |  |
|                      | 30 0340 0024      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|--|---|
| RF 116G<br>RF 216G   | 30 0340 0122      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0096      |                   | 3.7  |   |
|                      | 30 0340 0171      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0146      |                   | 3.7  |   |
|                      | 30 0340 0061      | SWB               | 3.7  |   |
| RF 116GF<br>RF 216GF | 30 0340 0148      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can   |
|                      | 30 0340 0122      |                   | 3.7  |   |
|                      | 30 0340 0197      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0171      |                   | 3.7  |   |
|                      | 30 0340 0086      | SWB               | 3.7  |   |
| RF 116H<br>RF 216H   | 30 0340 0211      | SWB               | 3.7  | Maximum of 2 plastic bag layers, one of which is a liner bag  |
| RF 116I<br>RF 216I   | 30 0340 0104      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0079      |                   | 3.7  |   |
|                      | 30 0340 0154      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0128      |                   | 3.7  |   |
|                      | 30 0340 0043      | SWB               | 3.7  |   |
| RF 116J<br>RF 216J   | 30 0340 0638      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0612      |                   | 3.7  |   |
|                      | 30 0340 0687      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0662      |                   | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|--|---|
| RF 116K<br>RF 216K   | 30 0340 0141      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0115      |                   | 3.7  |   |
|                      | 30 0340 0190      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0164      |                   | 3.7  |   |
| RF 116KF<br>RF 216KF | 30 0340 0166      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0141      |                   | 3.7  |   |
|                      | 30 0340 0216      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0190      |                   | 3.7  |   |
| RF 116L<br>RF 216L   | 30 0340 0817      | Drum              | 1.9  | Maximum of 5 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0792      |                   | 3.7  |   |
|                      | 30 0340 0867      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0841      |                   | 3.7  |   |
| RF 116M<br>RF 216M   | 30 0340 0150      | Drum              | 1.9  | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0124      |                   | 3.7  |   |
|                      | 30 0340 0199      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0174      |                   | 3.7  |   |
| RF 116MF<br>RF 216MF | 30 0340 0176      | Drum              | 1.9  | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0150      |                   | 3.7  |   |
|                      | 30 0340 0225      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0199      |                   | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 116N<br>RF 216N   | 30 0340 0459      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0433      |                   | 3.7  |  |
|                      | 30 0340 0508      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0482      |                   | 3.7  |  |
|                      | 30 0340 0390      | SWB               | 3.7  |  |
| RF 116P<br>RF 216P   | 30 0340 0126      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 116PF<br>RF 216PF | 30 0340 0203      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 30 0340 0177      |                   | 3.7  |  |
| RF 116Q<br>RF 216Q   | 30 0340 0437      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags  |
|                      | 30 0340 0412      |                   | 3.7  |  |
|                      | 30 0340 0487      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0461      |                   | 3.7  |  |
| RF 116R<br>RF 216R   | 30 0340 0665      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction   |
|                      | 30 0340 0639      |                   | 3.7  |  |
|                      | 30 0340 0714      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0689      |                   | 3.7  |  |
| RF 116RF<br>RF 216RF | 30 0340 0691      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0665      |                   | 3.7  |  |
|                      | 30 0340 0740      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0714      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 116S<br>RF 216S   | 30 0340 0844      | Drum              | 1.9  | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0819      |                   | 3.7  |  |
|                      | 30 0340 0894      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0868      |                   | 3.7  |  |
| RF 116SF<br>RF 216SF | 30 0340 0870      | Drum              | 1.9  | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0844      |                   | 3.7  |  |
|                      | 30 0340 0919      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0894      |                   | 3.7  |  |
| RF 116T<br>RF 216T   | 30 0340 0034      | SWB               | 3.7  | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 117A<br>RF 217A   | 20 0170 0480      | Drum              | 1.9  | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 20 0170 0455      |                   | 3.7  |  |
|                      | 20 0170 0530      | SWB Overpack      | 1.9  |  |
|                      | 20 0170 0504      |                   | 3.7  |  |
|                      | 20 0170 0031      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag   |
|                      | 20 0170 0365      | TDOP              | 3.7  | Maximum of 2 plastic bag layers, both of which are inner bags  |
| RF 117B<br>RF 217B   | 20 0000 0000      | Drum              | 1.9  | Metal can as innermost layer of confinement  |
|                      | 20 0000 0000      |                   | 3.7  |  |
|                      | 20 0000 0000      | SWB Overpack      | 1.9  |  |
|                      | 20 0000 0000      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| RF 117C<br>RF 217C | 20 0170 0122      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                    | 20 0170 0096      |                   | 3.7   |   |
|                    | 20 0170 0171      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0145      |                   | 3.7   |   |
| RF 117D<br>RF 217D | 20 0000 0000      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement in a pipe overpack  |
|                    | 20 0000 0000      |                   | 3.7   |   |
| RF 117E<br>RF 217E | 20 0170 0131      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                    | 20 0170 0106      |                   | 3.7   |   |
|                    | 20 0170 0181      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0155      |                   | 3.7   |   |
|                    | 20 0170 0070      | SWB               | 3.7   |   |
| RF 117F<br>RF 217F | 20 0170 0092      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                    | 20 0170 0067      |                   | 3.7   |   |
|                    | 20 0170 0142      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0116      |                   | 3.7   |   |
|                    | 20 0170 0024      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag   |
| RF 117H<br>RF 217H | 20 0170 0211      | SWB               | 3.7   | Maximum of 2 plastic bag layers, one of which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RF 117I<br>RF 217I | 20 0170 0104      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0079      |                   | 3.7   |  |
|                    | 20 0170 0154      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0128      |                   | 3.7   |  |
|                    | 20 0170 0043      | SWB               | 3.7   |  |
|                    | 20 0170 0025      | TDOP              | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags |
| RF 117K<br>RF 217K | 20 0170 0052      | SWB               | 3.7   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag  |
| RF 117N<br>RF 217N | 20 0170 0459      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag           |
|                    | 20 0170 0433      |                   | 3.7   |  |
|                    | 20 0170 0508      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0482      |                   | 3.7   |  |
|                    | 20 0170 0390      | SWB               | 3.7   |  |
| RF 117T<br>RF 217T | 20 0170 0034      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 118A<br>RF 218A | 20 0170 0480      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags           |
|                    | 20 0170 0455      |                   | 3.7   |  |
|                    | 20 0170 0530      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0504      |                   | 3.7   |  |
|                    | 20 0170 0031      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag                   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|---|---|
| RF 118B<br>RF 218B | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement   |
|                    | 20 0000 0000      |                   | 3.7   |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |   |
|                    | 20 0000 0000      |                   | 3.7   |   |
| RF 118C<br>RF 218C | 20 0170 0122      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                    | 20 0170 0096      |                   | 3.7   |   |
|                    | 20 0170 0171      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0145      |                   | 3.7   |   |
| RF 118D<br>RF 218D | 20 0000 0000      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement in a pipe overpack  |
|                    | 20 0000 0000      |                   | 3.7   |   |
| RF 118E<br>RF 218E | 20 0170 0131      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                    | 20 0170 0106      |                   | 3.7   |   |
|                    | 20 0170 0181      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0155      |                   | 3.7   |   |
|                    | 20 0170 0070      | SWB               | 3.7   |   |
| RF 118F<br>RF 218F | 20 0170 0092      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                    | 20 0170 0067      |                   | 3.7   |   |
|                    | 20 0170 0142      | SWB Overpack      | 1.9   |   |
|                    | 20 0170 0116      |                   | 3.7   |   |
|                    | 20 0170 0024      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag   |
| RF 118H<br>RF 218H | 20 0170 0211      | SWB               | 3.7   | Maximum of 2 plastic bag layers, one of which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 118I<br>RF 218I   | 20 0170 0104      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                      | 20 0170 0079      |                   | 3.7   |  |
|                      | 20 0170 0154      | SWB Overpack      | 1.9   |  |
|                      | 20 0170 0128      |                   | 3.7   |  |
|                      | 20 0170 0043      | SWB               | 3.7   |  |
| RF 118N<br>RF 218N   | 20 0170 0459      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 20 0170 0433      |                   | 3.7   |  |
|                      | 20 0170 0508      | SWB Overpack      | 1.9   |  |
|                      | 20 0170 0482      |                   | 3.7   |  |
|                      | 20 0170 0390      | SWB               | 3.7   |  |
| RF 118T<br>RF 218T   | 20 0170 0034      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 119A<br>RF 219A   | 30 0340 0480      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 30 0340 0455      |                   | 3.7   |  |
|                      | 30 0340 0530      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0504      |                   | 3.7   |  |
|                      | 30 0340 0031      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag   |
| RF 119BA<br>RF 219BA | 30 0340 0486      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0460      |                   | 3.7   |  |
|                      | 30 0340 0535      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0510      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|------------------------|-------------------|-------------------|--|--|
| RF 119BAF<br>RF 219BAF | 30 0340 0511      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                        | 30 0340 0486      |                   | 3.7  |  |
|                        | 30 0340 0561      | SWB Overpack      | 1.9  |  |
|                        | 30 0340 0535      |                   | 3.7  |  |
| RF 119C<br>RF 219C     | 30 0340 0122      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                        | 30 0340 0096      |                   | 3.7  |  |
|                        | 30 0340 0171      | SWB Overpack      | 1.9  |  |
|                        | 30 0340 0145      |                   | 3.7  |  |
| RF 119D<br>RF 219D     | 30 0340 0099      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
| RF 119DF<br>RF 219DF   | 30 0340 0150      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                        | 30 0340 0125      |                   | 3.7  |  |
| RF 119E<br>RF 219E     | 30 0340 0131      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction                  |
|                        | 30 0340 0106      |                   | 3.7  |  |
|                        | 30 0340 0181      | SWB Overpack      | 1.9  |  |
|                        | 30 0340 0155      |                   | 3.7  |  |
|                        | 30 0340 0070      | SWB               | 3.7  |  |
| RF 119EF<br>RF 219EF   | 30 0340 0157      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can  |
|                        | 30 0340 0131      |                   | 3.7  |  |
|                        | 30 0340 0206      | SWB Overpack      | 1.9  |  |
|                        | 30 0340 0181      |                   | 3.7  |  |
|                        | 30 0340 0096      | SWB               | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RF 119F<br>RF 219F   | 30 0340 0092      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                      | 30 0340 0067      |                   | 3.7   |   |
|                      | 30 0340 0142      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0116      |                   | 3.7   |   |
|                      | 30 0340 0024      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag   |
| RF 119G<br>RF 219G   | 30 0340 0122      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0096      |                   | 3.7   |   |
|                      | 30 0340 0171      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0146      |                   | 3.7   |   |
|                      | 30 0340 0061      | SWB               | 3.7   |   |
| RF 119GF<br>RF 219GF | 30 0340 0148      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can   |
|                      | 30 0340 0122      |                   | 3.7   |   |
|                      | 30 0340 0197      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0171      |                   | 3.7   |   |
|                      | 30 0340 0086      | SWB               | 3.7   |   |
| RF 119H<br>RF 219H   | 30 0340 0211      | SWB               | 3.7   | Maximum of 2 plastic bag layers, one of which is a liner bag  |
| RF 119I<br>RF 219I   | 30 0340 0104      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0079      |                   | 3.7   |   |
|                      | 30 0340 0154      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0128      |                   | 3.7   |   |
|                      | 30 0340 0043      | SWB               | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RF 119J<br>RF 219J   | 30 0340 0638      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0612      |                   | 3.7   |   |
|                      | 30 0340 0687      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0662      |                   | 3.7   |   |
| RF 119K<br>RF 219K   | 30 0340 0141      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0115      |                   | 3.7   |   |
|                      | 30 0340 0190      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0164      |                   | 3.7   |   |
| RF 119KF<br>RF 219KF | 30 0340 0166      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0141      |                   | 3.7   |   |
|                      | 30 0340 0216      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0190      |                   | 3.7   |   |
| RF 119L<br>RF 219L   | 30 0340 0817      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag  |
|                      | 30 0340 0792      |                   | 3.7   |   |
|                      | 30 0340 0867      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0841      |                   | 3.7   |   |
| RF 119M<br>RF 219M   | 30 0340 0150      | Drum              | 1.9   | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0124      |                   | 3.7   |   |
|                      | 30 0340 0199      | SWB Overpack      | 1.9   |   |
|                      | 30 0340 0174      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 119MF<br>RF 219MF | 30 0340 0176      | Drum              | 1.9  | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container  |
|                      | 30 0340 0150      |                   | 3.7  |  |
|                      | 30 0340 0225      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0199      |                   | 3.7  |  |
| RF 119N<br>RF 219N   | 30 0340 0459      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                      | 30 0340 0433      |                   | 3.7  |  |
|                      | 30 0340 0508      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0482      |                   | 3.7  |  |
|                      | 30 0340 0390      | SWB               | 3.7  |  |
| RF 119P<br>RF 219P   | 30 0340 0126      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction. |
| RF 119PF<br>RF 219PF | 30 0340 0203      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                      | 30 0340 0177      |                   | 3.7  |  |
| RF 119Q<br>RF 219Q   | 30 0340 0437      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are inner bags  |
|                      | 30 0340 0412      |                   | 3.7  |  |
|                      | 30 0340 0487      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0461      |                   | 3.7  |  |
| RF 119R<br>RF 219R   | 30 0340 0665      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction   |
|                      | 30 0340 0639      |                   | 3.7  |  |
|                      | 30 0340 0714      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0689      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 119RF<br>RF 219RF | 30 0340 0691      | Drum              | 1.9   | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0665      |                   | 3.7   |  |
|                      | 30 0340 0740      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0714      |                   | 3.7   |  |
| RF 119S<br>RF 219S   | 30 0340 0844      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0340 0819      |                   | 3.7   |  |
|                      | 30 0340 0894      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0868      |                   | 3.7   |  |
| RF 119SF<br>RF 219SF | 30 0340 0870      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0340 0844      |                   | 3.7   |  |
|                      | 30 0340 0919      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0894      |                   | 3.7   |  |
| RF 119T<br>RF 219T   | 30 0340 0034      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 119W<br>RF 219W   | 30 0340 0114      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a filtered liner bag   |
|                      | 30 0340 0088      |                   | 3.7   |  |
|                      | 30 0340 0163      | SWB Overpack      | 1.9   |  |
|                      | 30 0340 0137      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|------------------------|-------------------|-------------------|---|--|
| RF 121A<br>RF 221A     | 30 0340 0480      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                        | 30 0340 0455      |                   | 3.7   |  |
|                        | 30 0340 0530      | SWB Overpack      | 1.9   |  |
|                        | 30 0340 0504      |                   | 3.7   |  |
|                        | 30 0340 0031      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag   |
|                        | 30 0340 0365      | TDOP              | 3.7   | Maximum of 2 plastic bag layers, both of which are inner bags  |
| RF 121D<br>RF 221D     | 30 0340 0464      | Pipe Overpack     | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction          |
|                        | 30 0340 0439      |                   | 3.7   |  |
| RF 121DF<br>RF 221DF   | 30 0340 0490      | Pipe Overpack     | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                        | 30 0340 0464      |                   | 3.7   |  |
| RF 121DA<br>RF 221DA   | 30 0340 0099      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
| RF 121DAF<br>RF 221DAF | 30 0340 0150      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                        | 30 0340 0125      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| RF 121E<br>RF 221E | 30 0340 0131      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                    | 30 0340 0106      |                   | 3.7  |   |
|                    | 30 0340 0181      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0155      |                   | 3.7  |   |
|                    | 30 0340 0070      | SWB               | 3.7  |   |
| RF 121F<br>RF 221F | 30 0340 0092      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                    | 30 0340 0067      |                   | 3.7  |   |
|                    | 30 0340 0142      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0116      |                   | 3.7  |   |
|                    | 30 0340 0024      | SWB               | 3.7  | Maximum of 1 filtered plastic bag layer, which is a liner bag   |
| RF 121H<br>RF 221H | 30 0340 0211      | SWB               | 3.7  | Maximum of 2 plastic bag layers, one of which is a liner bag  |
| RF 121I<br>RF 221I | 30 0340 0104      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag   |
|                    | 30 0340 0079      |                   | 3.7  |   |
|                    | 30 0340 0154      | SWB Overpack      | 1.9  |   |
|                    | 30 0340 0128      |                   | 3.7  |   |
|                    | 30 0340 0043      | SWB               | 3.7  |   |
|                    | 30 0340 0025      | TDOP              | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RF 121J<br>RF 221J | 30 0340 0158      | Drum              | 1.9   | Filtered metal can as innermost layer of confinement within a maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can. Both filtered metal cans are fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
|                    | 30 0340 0133      |                   | 3.7   |  |
|                    | 30 0340 0208      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0182      |                   | 3.7   |  |
| RF 121K<br>RF 221K | 30 0340 0052      | SWB               | 3.7   | Maximum of 4 filtered plastic bag layers, one of which is a liner bag  |
| RF 121N<br>RF 221N | 30 0340 0459      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                    | 30 0340 0433      |                   | 3.7   |  |
|                    | 30 0340 0508      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0482      |                   | 3.7   |  |
|                    | 30 0340 0390      | SWB               | 3.7   |  |
| RF 121T<br>RF 221T | 30 0340 0034      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 121W<br>RF 221W | 30 0340 0114      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a filtered liner bag   |
|                    | 30 0340 0088      |                   | 3.7   |  |
|                    | 30 0340 0163      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0137      |                   | 3.7   |  |
| RF 122A<br>RF 222A | 20 0170 0480      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                    | 20 0170 0455      |                   | 3.7   |  |
|                    | 20 0170 0530      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0504      |                   | 3.7   |  |
|                    | 20 0170 0031      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RF 122B<br>RF 222B | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement  |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                    | 20 0000 0000      |                   | 3.7   |  |
| RF 122D<br>RF 222D | 20 0000 0000      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement in a pipe overpack   |
|                    | 20 0000 0000      |                   | 3.7   |  |
| RF 122E<br>RF 222E | 20 0170 0131      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can layer with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                    | 20 0170 0106      |                   | 3.7   |  |
|                    | 20 0170 0181      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0155      |                   | 3.7   |  |
|                    | 20 0170 0070      | SWB               | 3.7   |  |
| RF 122F<br>RF 222F | 20 0170 0092      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags   |
|                    | 20 0170 0067      |                   | 3.7   |  |
|                    | 20 0170 0142      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0116      |                   | 3.7   |  |
|                    | 20 0170 0024      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag  |
| RF 122H<br>RF 222H | 20 0170 0211      | SWB               | 3.7   | Maximum of 2 plastic bag layers, one of which is a liner bag   |
| RF 122I<br>RF 222I | 20 0170 0104      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0079      |                   | 3.7   |  |
|                    | 20 0170 0154      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0128      |                   | 3.7   |  |
|                    | 20 0170 0043      | SWB               | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RF 122N<br>RF 222N | 20 0170 0459      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag           |
|                    | 20 0170 0433      |                   | 3.7   |  |
|                    | 20 0170 0508      | SWB Overpack      | 1.9   |  |
|                    | 20 0170 0482      |                   | 3.7   |  |
|                    | 20 0170 0390      | SWB               | 3.7   |  |
| RF 122T<br>RF 222T | 20 0170 0034      | SWB               | 3.7   | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 123A<br>RF 223A | 30 0340 0480      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags           |
|                    | 30 0340 0455      |                   | 3.7   |  |
|                    | 30 0340 0530      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0504      |                   | 3.7   |  |
| RF 123E<br>RF 223E | 30 0340 0122      | Drum              | 1.9   | Maximum of 2 plastic bag layers, both of which are liner bags          |
|                    | 30 0340 0096      |                   | 3.7   |  |
|                    | 30 0340 0171      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0145      |                   | 3.7   |  |
| RF 123F<br>RF 223F | 30 0340 0092      | Drum              | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are liner bags |
|                    | 30 0340 0067      |                   | 3.7   |  |
|                    | 30 0340 0142      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0116      |                   | 3.7   |  |
|                    | 30 0340 0024      | SWB               | 3.7   | Maximum of 1 filtered plastic bag layer, which is a liner bag          |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|---|--|
| RF 123I<br>RF 223I | 30 0340 0104      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 30 0340 0079      |                   | 3.7   |  |
|                    | 30 0340 0154      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0128      |                   | 3.7   |  |
|                    | 30 0340 0043      | SWB               | 3.7   |  |
| RF 123N<br>RF 223N | 30 0340 0459      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                    | 30 0340 0433      |                   | 3.7   |  |
|                    | 30 0340 0508      | SWB Overpack      | 1.9   |  |
|                    | 30 0340 0482      |                   | 3.7   |  |
|                    | 30 0340 0390      | SWB               | 3.7   |  |
| RF 124B<br>RF 224B | 20 0000 0000      | Drum              | 1.9   | Metal can as innermost layer of confinement  |
|                    | 20 0000 0000      |                   | 3.7   |  |
|                    | 20 0000 0000      | SWB Overpack      | 1.9   |  |
|                    | 20 0000 0000      |                   | 3.7   |  |
| RF 124D<br>RF 224D | 20 0000 0000      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement in a pipe overpack   |
|                    | 20 0000 0000      |                   | 3.7   |  |
| RF 124E<br>RF 224E | 20 0008 0181      | Drum              | 1.9   | Metal can as innermost layer of confinement within a maximum of 1 filtered metal can, and 4 filtered plastic bag layers, two of which are liner bags. The filtered metal can is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
|                    | 20 0008 0146      |                   | 3.7   |  |
|                    | 20 0008 0251      | SWB Overpack      | 1.9   |  |
|                    | 20 0008 0216      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 124F<br>RF 224F   | 20 0008 0164      | Pipe Overpack     | 3.7  | Metal can as innermost layer of confinement within a maximum of 1 filtered metal can, and 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction. |
| RF 124FF<br>RF 224FF | 20 0008 0271      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 1 filtered metal can, and 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                      | 20 0008 0235      |                   | 3.7  |  |
| RF 124G<br>RF 224G   | 20 0008 0127      | Pipe Overpack     | 3.7  | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction  |
| RF 124GF<br>RF 224GF | 20 0008 0198      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                      | 20 0008 0162      |                   | 3.7  |  |
| RF 124H<br>RF 224H   | 20 0008 0581      | Pipe Overpack     | 3.7  | Metal can as innermost layer of confinement within a maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction   |
| RF 124HF<br>RF 224HF | 20 0008 0652      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 20 0008 0616      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|------------------------|-------------------|-------------------|---|---|
| RF 126A<br>RF 226A     | 30 0340 0459      | Drum              | 1.9   | Maximum of 3 plastic bag layers, one of which is a liner bag  |
|                        | 30 0340 0433      |                   | 3.7   |   |
|                        | 30 0340 0508      | SWB Overpack      | 1.9   |   |
|                        | 30 0340 0482      |                   | 3.7   |   |
| RF 126D<br>RF 226D     | 30 0340 0439      | Pipe Overpack     | 3.7   | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction             |
| RF 126DF<br>RF 226DF   | 30 0340 0490      | Pipe Overpack     | 1.9   | Maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                        | 30 0340 0464      |                   | 3.7   |   |
| RF 126DA<br>RF 226DA   | 30 0340 0099      | Pipe Overpack     | 3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction    |
| RF 126DAF<br>RF 226DAF | 30 0340 0150      | Pipe Overpack     | 1.9   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                        | 30 0340 0125      |                   | 3.7   |   |
| RF 126E<br>RF 226E     | 30 0340 0104      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag.  |
|                        | 30 0340 0079      |                   | 3.7   |   |
|                        | 30 0340 0154      | SWB Overpack      | 1.9   |   |
|                        | 30 0340 0128      |                   | 3.7   |   |
| RF 126J<br>RF 226J     | 30 0340 0158      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
|                        | 30 0340 0133      |                   | 3.7   |   |
|                        | 30 0340 0208      | SWB Overpack      | 1.9   |   |
|                        | 30 0340 0182      |                   | 3.7   |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|--|---|
| RF 126K<br>RF 226K   | 30 0340 0122      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags   |
|                      | 30 0340 0096      |                   | 3.7  |   |
|                      | 30 0340 0171      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0145      |                   | 3.7  |   |
| RF 126L<br>RF 226L   | 30 0340 0092      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                      | 30 0340 0067      |                   | 3.7  |   |
|                      | 30 0340 0142      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0116      |                   | 3.7  |   |
| RF 126P<br>RF 226P   | 30 0340 0126      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
| RF 126PF<br>RF 226PF | 30 0340 0203      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack   |
|                      | 30 0340 0177      |                   | 3.7  |   |
| RF 127A<br>RF 227A   | 30 0340 0122      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags.  |
|                      | 30 0340 0096      |                   | 3.7  |   |
|                      | 30 0340 0171      | SWB Overpack      | 1.9  |   |
|                      | 30 0340 0145      |                   | 3.7  |   |
|                      | 30 0340 0031      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag.   |
| RF 127D<br>RF 227D   | 30 0340 0099      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter having a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction.   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category  | Payload Container           | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|--|-----------------------------|--|---|
| RF 127DF<br>RF 227DF | 30 0340 0150<br>30 0340 0125   | Pipe Overpack               | 1.9<br>3.7   | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack.   |
| RF 127E<br>RF 227E   | 30 0340 0111<br>30 0340 0085<br>30 0340 0160<br>30 0340 0135                 | Drum<br>SWB Overpack        | 1.9<br>3.7<br>1.9<br>3.7                                       | Maximum of 4 filtered plastic bag layers, two of which are liner bags, and 2 metal cans, each of which are closed with a slip-top lid.  |
| RF 127F<br>RF 227F   | 30 0340 0092<br>30 0340 0067<br>30 0340 0142<br>30 0340 0116<br>30 0340 0024 | Drum<br>SWB Overpack<br>SWB | 1.9<br>3.7<br>1.9<br>3.7<br>3.7                                | Maximum of 2 filtered plastic bag layers, both of which are liner bags.<br><br>Maximum of 1 filtered plastic bag layer, which is a liner bag.   |
| RF 127H<br>RF 227H   | 30 0340 0280<br>30 0340 0254<br>30 0340 0329<br>30 0340 0303                 | Drum<br>SWB Overpack        | 1.9<br>3.7<br>1.9<br>3.7                                       | Maximum of 2 plastic bag layers, one of which is a liner bag  |
| RF 127J<br>RF 227J   | 30 0340 0158<br>30 0340 0133<br>30 0340 0208<br>30 0340 0182                 | Drum<br>SWB Overpack        | 1.9<br>3.7<br>1.9<br>3.7                                       | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 127K<br>RF 227K   | 30 0340 0141      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, 1 of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction.   |
|                      | 30 0340 0115      |                   | 3.7  |  |
|                      | 30 0340 0190      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0164      |                   | 3.7  |  |
| RF 127N<br>RF 227N   | 30 0340 0100      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is a liner bag.  |
|                      | 30 0340 0075      |                   | 3.7  |  |
|                      | 30 0340 0150      | SWB Overpack      | 1.9  |  |
|                      | 30 0340 0124      |                   | 3.7  |  |
|                      | 30 0340 0390      | SWB               | 3.7  | Maximum of 3 plastic bag layers, 1 of which is a liner bag.  |
| RF 127P<br>RF 227P   | 30 0340 0126      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction. |
| RF 127PF<br>RF 227PF | 30 0340 0203      | Pipe Overpack     | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack.   |
|                      | 30 0340 0177      |                   | 3.7  |  |
| RF 130A<br>RF 230A   | 30 0185 0480      | Drum              | 1.9  | Maximum of 4 plastic bag layers, two of which are liner bags   |
|                      | 30 0185 0455      |                   | 3.7  |  |
|                      | 30 0185 0530      | SWB Overpack      | 1.9  |  |
|                      | 30 0185 0504      |                   | 3.7  |  |
|                      | 30 0185 0031      | SWB               | 3.7  | Maximum of 1 plastic bag layer, which is a liner bag   |
|                      | 30 0185 0365      | TDOP              | 3.7  | Maximum of 2 plastic bag layers, both of which are inner bags  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 130B<br>RF 230B   | 30 0034 0480      | Drum              | 1.9  | Metal can as innermost layer of confinement within a maximum of 4 plastic bag layers, two of which are liner bags  |
|                      | 30 0034 0455      |                   | 3.7  |  |
|                      | 30 0034 0530      | SWB Overpack      | 1.9  |  |
|                      | 30 0034 0504      |                   | 3.7  |  |
| RF 130BA<br>RF 230BA | 30 0034 0486      | Drum              | 1.9  | Metal can as innermost layer of confinement within a maximum of 3 plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction                  |
|                      | 30 0034 0460      |                   | 3.7  |  |
|                      | 30 0034 0535      | SWB Overpack      | 1.9  |  |
|                      | 30 0034 0510      |                   | 3.7  |  |
| RF 130D<br>RF 230D   | 30 0034 0464      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
|                      | 30 0034 0439      |                   | 3.7  |  |
| RF 130DF<br>RF 230DF | 30 0034 0490      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 plastic bag layers, both of which are inner bags, in a pipe overpack   |
|                      | 30 0034 0464      |                   | 3.7  |  |
| RF 130E<br>RF 230E   | 30 0034 0111      | Drum              | 1.9  | Metal can as innermost layer of confinement within a maximum of 4 filtered plastic bag layers, two of which are liner bags   |
|                      | 30 0034 0085      |                   | 3.7  |  |
|                      | 30 0034 0160      | SWB Overpack      | 1.9  |  |
|                      | 30 0034 0135      |                   | 3.7  |  |
| RF 130F<br>RF 230F   | 30 0185 0111      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, two of which are liner bags  |
|                      | 30 0185 0085      |                   | 3.7  |  |
|                      | 30 0185 0160      | SWB Overpack      | 1.9  |  |
|                      | 30 0185 0135      |                   | 3.7  |  |
|                      | 30 0185 0024      | SWB               | 3.7  | Maximum of 1 filtered plastic bag layer, which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|---|--|
| RF 130G<br>RF 230G   | 30 0034 0125      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                        |
|                      | 30 0034 0099      |                   | 3.7   |  |
| RF 130GF<br>RF 230GF | 30 0034 0150      | Pipe Overpack     | 1.9   | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack  |
|                      | 30 0034 0125      |                   | 3.7   |  |
| RF 130H<br>RF 230H   | 30 0185 0211      | SWB               | 3.7   | Maximum of 2 plastic bag layers, one of which is a liner bag   |
| RF 130I<br>RF 230I   | 30 0185 0104      | Drum              | 1.9   | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                      | 30 0185 0079      |                   | 3.7   |  |
|                      | 30 0185 0154      | SWB Overpack      | 1.9   |  |
|                      | 30 0185 0128      |                   | 3.7   |  |
|                      | 30 0185 0043      | SWB               | 3.7   | Maximum of 2 filtered plastic bags, both of which are inner bags   |
|                      | 30 0185 0025      | TDOP              | 3.7   |  |
| RF 130J<br>RF 230J   | 30 0034 0158      | Drum              | 1.9   | Filtered metal can as innermost layer of confinement within a maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can. Both filtered metal cans are fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
|                      | 30 0034 0133      |                   | 3.7   |  |
|                      | 30 0034 0208      | SWB Overpack      | 1.9   |  |
|                      | 30 0034 0182      |                   | 3.7   |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code           | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement   |
|------------------------|-------------------|-------------------|--|---|
| RF 130K<br>RF 230K     | 30 0185 0665      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction  |
|                        | 30 0185 0639      |                   | 3.7  |   |
|                        | 30 0185 0714      | SWB Overpack      | 1.9  |   |
|                        | 30 0185 0689      |                   | 3.7  |   |
|                        | 30 0185 0052      | SWB               | 3.7  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag   |
| RF 130N<br>RF 230N     | 30 0185 0390      | SWB               | 3.7  | Maximum of 3 plastic bag layers, one of which is a liner bag  |
| RF 130P<br>RF 230P     | 30 0034 0126      | Pipe Overpack     | 3.7  | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction. |
| RF 130PF<br>RF 230PF   | 30 0034 0203      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within a maximum of 2 filtered plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                        | 30 0034 0177      |                   | 3.7  |   |
| RF 130PA<br>RF 230PA   | 30 0034 0466      | Pipe Overpack     | 3.7  | Metal can as innermost layer of confinement within 2 plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack. Both the filtered metal can and the pipe component are fitted with a filter having a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction.                       |
| RF 130PAF<br>RF 230PAF | 30 0034 0543      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement within 2 plastic bag layers, both of which are inner bags, and 1 filtered metal can in a pipe overpack  |
|                        | 30 0034 0517      |                   | 3.7  |   |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 130Q<br>RF 230Q   | 30 0185 0638      | Drum              | 1.9  | Maximum of 4 plastic bag layers, one of which is a liner bag   |
|                      | 30 0185 0612      |                   | 3.7  |  |
|                      | 30 0185 0687      | SWB Overpack      | 1.9  |  |
|                      | 30 0185 0662      |                   | 3.7  |  |
| RF 130R<br>RF 230R   | 30 0185 0141      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a hydrogen diffusivity of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction      |
|                      | 30 0185 0115      |                   | 3.7  |  |
|                      | 30 0185 0190      | SWB Overpack      | 1.9  |  |
|                      | 30 0185 0164      |                   | 3.7  |  |
| RF 130RF<br>RF 230RF | 30 0185 0166      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container  |
|                      | 30 0185 0141      |                   | 3.7  |  |
|                      | 30 0185 0216      | SWB Overpack      | 1.9  |  |
|                      | 30 0185 0190      |                   | 3.7  |  |
| RF 130S<br>RF 230S   | 30 0185 0844      | Drum              | 1.9  | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0185 0819      |                   | 3.7  |  |
|                      | 30 0185 0894      | SWB Overpack      | 1.9  |  |
|                      | 30 0185 0868      |                   | 3.7  |  |
| RF 130SF<br>RF 230SF | 30 0185 0870      | Drum              | 1.9  | Maximum of 5 plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0185 0844      |                   | 3.7  |  |
|                      | 30 0185 0919      | SWB Overpack      | 1.9  |  |
|                      | 30 0185 0894      |                   | 3.7  |  |
| RF 130T<br>RF 230T   | 30 0185 0034      | SWB               | 3.7  | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>(x 10 <sup>-6</sup> ) | Layers of Confinement   |
|----------------------|-------------------|-------------------|---|---|
| RF 130U<br>RF 230U   | 30 0185 0817      | Drum              | 1.9   | Maximum of 5 plastic bag layers, one of which is a liner bag  |
|                      | 30 0185 0792      |                   | 3.7   |   |
|                      | 30 0185 0867      | SWB Overpack      | 1.9   |   |
|                      | 30 0185 0841      |                   | 3.7   |   |
| RF 130V<br>RF 230V   | 30 0185 0150      | Drum              | 1.9   | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 30 0185 0124      |                   | 3.7   |   |
|                      | 30 0185 0199      | SWB Overpack      | 1.9   |   |
|                      | 30 0185 0174      |                   | 3.7   |   |
| RF 130VF<br>RF 230VF | 30 0185 0176      | Drum              | 1.9   | Maximum of 5 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container   |
|                      | 30 0185 0150      |                   | 3.7   |   |
|                      | 30 0185 0225      | SWB Overpack      | 1.9   |   |
|                      | 30 0185 0199      |                   | 3.7   |   |
| RF 130W<br>RF 230W   | 30 0185 0114      | Drum              | 1.9   | Maximum of 4 filtered plastic bag layers, one of which is a filtered liner bag  |
|                      | 30 0185 0088      |                   | 3.7   |   |
|                      | 30 0185 0163      | SWB Overpack      | 1.9   |   |
|                      | 30 0185 0137      |                   | 3.7   |   |
| RF 131A<br>RF 231A   | 20 0170 0480      | Drum              | 1.9   | Maximum of 4 plastic bag layers, two of which are liner bags  |
|                      | 20 0170 0455      |                   | 3.7   |   |
|                      | 20 0170 0530      | SWB Overpack      | 1.9   |   |
|                      | 20 0170 0504      |                   | 3.7   |   |
|                      | 20 0170 0031      | SWB               | 3.7   | Maximum of 1 plastic bag layer, which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement   |
|--------------------|-------------------|-------------------|--|---|
| RF 131B<br>RF 231B | 20 0000 0000      | Drum              | 1.9  | Metal can as innermost layer of confinement   |
|                    | 20 0000 0000      |                   | 3.7  |   |
|                    | 20 0000 0000      | SWB Overpack      | 1.9  |   |
|                    | 20 0000 0000      |                   | 3.7  |   |
| RF 131D<br>RF 231D | 20 0000 0000      | Pipe Overpack     | 1.9  | Metal can as innermost layer of confinement in a pipe overpack  |
|                    | 20 0000 0000      |                   | 3.7  |   |
| RF 131E<br>RF 231E | 20 0170 0131      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 1 filtered metal can fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |
|                    | 20 0170 0106      |                   | 3.7  |   |
|                    | 20 0170 0181      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0155      |                   | 3.7  |   |
|                    | 20 0170 0070      | SWB               | 3.7  |   |
| RF 131F<br>RF 231F | 20 0170 0092      | Drum              | 1.9  | Maximum of 2 filtered plastic bag layers, both of which are liner bags  |
|                    | 20 0170 0067      |                   | 3.7  |   |
|                    | 20 0170 0142      | SWB Overpack      | 1.9  |   |
|                    | 20 0170 0116      |                   | 3.7  |   |
|                    | 20 0170 0024      | SWB               | 3.7  | Maximum of 1 filtered plastic bag layer, which is a liner bag   |
| RF 131H<br>RF 231H | 20 0170 0211      | SWB               | 3.7  | Maximum of 2 plastic bag layers, one of which is a liner bag  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code       | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup><br>( $\times 10^{-6}$ ) | Layers of Confinement  |
|--------------------|-------------------|-------------------|--|--|
| RF 131I<br>RF 231I | 20 0170 0104      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag  |
|                    | 20 0170 0079      |                   | 3.7  |  |
|                    | 20 0170 0154      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0128      |                   | 3.7  |  |
|                    | 20 0170 0043      | SWB               | 3.7  |  |
| RF 131K<br>RF 231K | 20 0170 0052      | SWB               | 3.7  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag  |
| RF 131N<br>RF 231N | 20 0170 0459      | Drum              | 1.9  | Maximum of 3 plastic bag layers, one of which is a liner bag   |
|                    | 20 0170 0433      |                   | 3.7  |  |
|                    | 20 0170 0508      | SWB Overpack      | 1.9  |  |
|                    | 20 0170 0482      |                   | 3.7  |  |
|                    | 20 0170 0390      | SWB               | 3.7  |  |
| RF 131T<br>RF 231T | 20 0170 0034      | SWB               | 3.7  | Maximum of 2 filtered plastic bag layers, one of which is a liner bag  |
| RF 132A<br>RF 232A | 10 0130 0142      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags  |
|                    | 10 0130 0107      |                   | 3.7  |  |
|                    | 10 0130 0212      | SWB Overpack      | 1.9  |  |
|                    | 10 0130 0177      |                   | 3.7  |  |
| RF 132D<br>RF 232D | 10 0130 0127      | Pipe Overpack     | 3.7  | Maximum of 2 filtered plastic bag layers, both of which are inner bags, in a pipe overpack with a pipe component fitted with a filter with a minimum hydrogen diffusivity value of $3.7 \times 10^{-6}$ mol/s/mol fraction |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.



**TABLE 2B (Continued)**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CLOSE-PROXIMITY SHIPMENTS (20-DAY SHIPPING PERIOD)**

| Content Code         | Shipping Category | Payload Container | Filter Hydrogen Diffusivity <sup>a</sup> (x 10 <sup>-6</sup> ) | Layers of Confinement  |
|----------------------|-------------------|-------------------|--|--|
| RF 132J<br>RF 232J   | 10 0130 0209      | Drum              | 1.9  | Maximum of 3 filtered plastic bag layers, one of which is a liner bag, and 2 filtered metal cans, each of which is fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction |
|                      | 10 0130 0174      |                   | 3.7  |  |
|                      | 10 0130 0279      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0244      |                   | 3.7  |  |
| RF 132K<br>RF 232K   | 10 0130 0185      | Drum              | 1.9  | Maximum of 4 filtered plastic bag layers, one of which is a liner bag, and 1 filtered container fitted with a filter with a minimum hydrogen diffusivity value of 3.7 x 10 <sup>-6</sup> mol/s/mol fraction                    |
|                      | 10 0130 0149      |                   | 3.7  |  |
|                      | 10 0130 0255      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0219      |                   | 3.7  |  |
| RF 132P<br>RF 232P   | 10 0130 0103      | Drum              | 1.9  | Maximum of 2 plastic bag layers, both of which are liner bags punctured with a minimum 0.3-inch diameter hole  |
|                      | 10 0130 0068      |                   | 3.7  |  |
|                      | 10 0130 0173      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0138      |                   | 3.7  |  |
| RF 132Q<br>RF 232Q   | 10 0130 0121      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is a liner bag   |
|                      | 10 0130 0085      |                   | 3.7  |  |
|                      | 10 0130 0191      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0155      |                   | 3.7  |  |
| RF 132QA<br>RF 232QA | 10 0130 0119      | Drum              | 1.9  | Maximum of 1 plastic bag layer, which is a liner bag, and no rigid liner lid   |
|                      | 10 0130 0083      |                   | 3.7  |  |
|                      | 10 0130 0189      | SWB Overpack      | 1.9  |  |
|                      | 10 0130 0153      |                   | 3.7  |  |

<sup>a</sup> Minimum hydrogen diffusivity value of the filter on the primary payload container in mole/second/mole fraction (mol/s/mol fraction). Note: For the pipe overpack packaging configuration, the hydrogen diffusivity value is specified for the filter on the secondary payload container (i.e., 55-gallon drum) in mol/s/mol fraction.

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**TABLE 2C**  
**SUMMARY OF APPROVED CONTENT CODES**  
**AND CORRESPONDING SHIPPING CATEGORIES**  
**FOR CONTROLLED SHIPMENTS (10-DAY SHIPPING PERIOD)**

*[To Be Completed Following WIPP CH-TRU Payload Engineer Approval of Site Requests]*

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**TABLE 3**  
**WASTE GENERATOR/SHIPPER SITE IDENTIFICATION CODES**

| <b>SITE NAME</b>  | <b>Site Identifier Code</b> |
|---|-----------------------------|
| Argonne National Laboratory - East (ANL-E)                      | AE                          |
| Argonne National Laboratory - West (ANL-W)                      | AW                          |
| Idaho National Engineering and Environmental Laboratory (INEEL) | ID                          |
| Los Alamos National Laboratory (LANL)                           | LA                          |
| Lawrence Livermore National Laboratory (LLNL)                   | LL                          |
| Mound Laboratory (MOUND)  | MD                          |
| Nevada Test Site (NTS)  | NT                          |
| Oak Ridge National Laboratory (ORNL)                            | OR                          |
| Rocky Flats Environmental Technology Site (RFETS)               | RF                          |
| Richland Hanford (RH)   | RH                          |
| Sandia National Laboratories/California (SNL/CA)                | SL                          |
| Small Quantity (SQ)   | SQ                          |
| Savannah River Site (SRS)                                       | SR                          |

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**TABLE 4**  
**CONTENT CODES FOR CH-TRU WASTE**

| WASTE TYPE | CONTENT CODE(S) <sup>a</sup> | DESCRIPTION  |
|------------|------------------------------|--|
| I          | 111/211                      | <u>TRU Solidified Aqueous or Homogeneous Inorganic Solids</u> : Cemented or dewatered sludge precipitated from aqueous waste treatment processes. Soils that are not contaminated with organic chemicals are classified as homogeneous solids. |
| IV         | 112/212                      | <u>TRU Solidified Organics</u> : Cemented or absorbed organic liquids from production or laboratory processes.   |
| IV         | 113/213                      | <u>TRU Solidified Laboratory Waste</u> : Cemented or absorbed neutralized aqueous laboratory waste (contains organic acids, etc.).   |
| I          | 114/214                      | <u>TRU Solidified Inorganic Process Solids</u> : Cemented inorganic particulate or sludge-like (not chemically precipitated) wastes from plutonium recovery operations.  |
| II         | 115/215                      | <u>TRU Graphite Waste</u> : Discarded graphite molds, laboratory equipment, and furnace equipment (whole or pieces) from plutonium casting or laboratory operations.   |
| III        | 116/216                      | <u>TRU Combustible Waste</u> : Cellulosic, plastic, or cloth waste from various processes.   |
| II         | 117/217                      | <u>TRU Metal Waste</u> : Discarded metal (i.e., tantalum, aluminum, stainless steel) from production or maintenance operations.  |
| II         | 118/218                      | <u>TRU Glass Waste</u> : Discarded labware, windows, containers, or Raschig rings from various processes.  |
| III        | 119/219                      | <u>TRU Filter Waste</u> : High-efficiency particulate air (HEPA) filters or processed filter media from filter change operations. (Most filters or the housings for filters are made of organic material.)                                     |
| II         | 120/220                      | <u>TRU Isotopic Source Waste</u> .   |
| III        | 121/221                      | <u>TRU Organic Solid Waste</u> : Solid organic waste such as methyl methacrylate (Plexiglas) and Benelex.  |
| II         | 122/222                      | <u>TRU Inorganic Solid Waste</u> : Solid inorganic waste such as insulation, firebrick, and concrete.  |
| III        | 123/223                      | <u>TRU Leaded Rubber</u> : Discarded leaded glovebox gloves and leaded aprons.   |
| II         | 124/224                      | <u>TRU Pyrochemical Salt Waste</u> : Used chloride salts from pyrochemical processes such as electrowinning, molten salt extraction, or direct oxide reduction.  |
| III        | 125/225                      | <u>TRU Combustible and Noncombustible Waste</u> : Mixture of paper, plastic, metal, and glass waste.   |
| III        | 126/226                      | <u>TRU Cemented Organic Process Solids</u> : Cemented organic particulate, sludge-like (not chemically precipitated) waste or resins.  |

**TABLE 4 (Continued)**  
**CONTENT CODES FOR CH-TRU WASTE**

| WASTE<br>TYPE | CONTENT<br>CODE(S) <sup>a</sup> | DESCRIPTION   |
|---------------|---------------------------------|---|
| III           | 127/227                         | <u>TRU Combined Solid Organics, Solid Inorganics, and Solidified Inorganics:</u> Cellulosic, plastic, or cloth waste from various processes, discarded graphite, nonpyrophoric waste metals, glass and ceramic waste, and spent chloride salts, combined with cemented or dewatered sludge precipitated from aqueous waste treatment process. |
| II            | 128/228                         | <u>Combined Solidified Inorganics and Solid Inorganics:</u> Discarded graphite pieces, metal, glass, firebrick, concrete, and pyrochemical salt waste from various processes, combined with aqueous effluent and particulate and sludge-type wastes that have been solidified with Portland cement.   |
| IV            | 129/229                         | <u>Combined Solidified Organics:</u> Cemented or absorbed organic liquids from production or laboratory processes combined with cemented or absorbed neutralized aqueous laboratory waste (containing organic acid, etc.).  |
| III           | 130/230                         | <u>Solid Inorganic with Residual Organic Waste.</u>   |
| II            | 131/231                         | <u>Solid Inorganic Waste with Greater than Trace Quantities of Beryllium:</u> Solid inorganic waste (e.g., graphite waste, metal, glass, pyrochemical salt waste, insulation, firebrick, and concrete) that contains beryllium in greater than trace amounts.   |
| I             | 132/232                         | <u>TRU Solidified Aqueous or Homogeneous Inorganic Solids with Greater than Trace Quantities of Beryllium:</u> Cemented or dewatered sludge precipitated from aqueous waste treatment processes that contains beryllium in greater than trace amounts.  |

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<sup>a</sup>1XX = Waste generated under a formal certification program, as specified in the CH-TRAMPAC.

2XX = Waste generated prior to site implementation of a formal certification program, as specified in the CH-TRAMPAC.



**TABLE 5**  
**NUMERIC/ALPHA-NUMERIC SHIPPING CATEGORY**  
**NOTATION CROSS CORRELATION**

| <b>Numeric Payload<br/>Shipping Category<sup>a</sup></b> | <b>Alpha-Numeric Payload<br/>Shipping Category<sup>b</sup></b> |
|--|--|
| 10 0040 0034   | I.3C0  |
| 10 0040 0147   | I.3A0  |
| 10 0040 0168   | I.3A1  |
| 10 0040 0190   | I.3A2  |
| 10 0040 0207   | I.3B0  |
| 10 0040 0229   | I.3B1  |
| 10 0040 0250   | I.3B2  |
| 10 0040 0648   | I.3A3  |
| 10 0040 0709   | I.3B3  |
| 10 0040 0888   | I.3A4  |
| 10 0040 0949   | I.3B4  |
|  |  |
| 10 0130 0034   | I.2C0  |
| 10 0130 0147   | I.2A0  |
| 10 0130 0168   | I.2A1  |
| 10 0130 0190   | I.2A2  |
| 10 0130 0207   | I.2B0  |
| 10 0130 0229   | I.2B1  |
| 10 0130 0250   | I.2B2  |
| 10 0130 0648   | I.2A3  |
| 10 0130 0709   | I.2B3  |
| 10 0130 0888   | I.2A4  |
| 10 0130 0949   | I.2B4  |
|  |  |
| 10 0160 0034   | I.1C0  |
| 10 0160 0059   | I.1C2  |
| 10 0160 0147   | I.1A0  |
| 10 0160 0168   | I.1A1  |
| 10 0160 0190   | I.1A2  |
| 10 0160 0207   | I.1B0  |
| 10 0160 0229   | I.1B1  |
| 10 0160 0250   | I.1B2  |

<sup>a</sup> Payload shipping category notation initiated in June 1999.

<sup>b</sup> Payload shipping category notation used through June 1999.

**TABLE 5 (Continued)**  
**NUMERIC/ALPHA-NUMERIC SHIPPING CATEGORY**  
**NOTATION CROSS CORRELATION**

| <b>Numeric Payload<br/>Shipping Category<sup>a</sup></b> | <b>Alpha-Numeric Payload<br/>Shipping Category<sup>b</sup></b> |
|--|--|
| 10 0160 0286   | I.1C2b   |
| 10 0160 0648   | I.1A3  |
| 10 0160 0709   | I.1B3  |
|  |  |
| 20 0000 0000   | II.2AM   |
| 20 0000 0000   | II.2BM   |
| 20 0000 0000   | II.2CM   |
| 20 0000 0000   | II.2E0   |
|  |  |
| 20 0170 0028   | II.1C0   |
| 20 0170 0034   | II.1C1f  |
| 20 0170 0039   | II.1C2f  |
| 20 0170 0041   | II.1C1   |
| 20 0170 0043   | II.1C2bf   |
| 20 0170 0049   | II.1C3f  |
| 20 0170 0053   | II.1C2   |
| 20 0170 0067   | II.1D2   |
| 20 0170 0127   | II.1A0   |
| 20 0170 0133   | II.1A1f  |
| 20 0170 0140   | II.1A2af   |
| 20 0170 0143   | II.1A2f  |
| 20 0170 0148   | II.1A1   |
| 20 0170 0152   | II.1A3f  |
| 20 0170 0166   | II.1B0   |
| 20 0170 0169   | II.1A2a  |
| 20 0170 0188   | II.1B1   |
| 20 0170 0209   | II.1B2a  |
| 20 0170 0220   | II.1C2b  |
| 20 0170 0233   | II.1C3   |
| 20 0170 0327   | II.1A2   |
| 20 0170 0367   | II.1B2   |
| 20 0170 0412   | II.1C4   |

<sup>a</sup> Payload shipping category notation initiated in June 1999.

<sup>b</sup> Payload shipping category notation used through June 1999.

**TABLE 5 (Continued)**  
**NUMERIC/ALPHA-NUMERIC SHIPPING CATEGORY**  
**NOTATION CROSS CORRELATION**

| <b>Numeric Payload<br/>Shipping Category<sup>a</sup></b> | <b>Alpha-Numeric Payload<br/>Shipping Category<sup>b</sup></b> |
|--|--|
| 20 0170 0506   | II.1A3   |
| 20 0170 0546   | II.1B3   |
| 20 0170 0686   | II.1A4   |
| 20 0170 0725   | II.1B4   |
| 20 0170 0865   | II.1A5   |
| 20 0170 0905   | II.1B5   |
| 20 0170 1044   | II.1A6   |
| 20 0170 1084   | II.1B6   |
|  |  |
| 30 0340 0028   | III.1C0  |
| 30 0340 0034   | III.1C1f   |
| 30 0340 0039   | III.1C2f   |
| 30 0340 0041   | III.1C1  |
| 30 0340 0043   | III.1C2bf  |
| 30 0340 0049   | III.1C3f   |
| 30 0340 0053   | III.1C2  |
| 30 0340 0067   | III.1D2  |
| 30 0340 0127   | III.1A0  |
| 30 0340 0133   | III.1A1f   |
| 30 0340 0140   | III.1A2af  |
| 30 0340 0143   | III.1A2f   |
| 30 0340 0148   | III.1A1  |
| 30 0340 0152   | III.1A3f   |
| 30 0340 0166   | III.1B0  |
| 30 0340 0169   | III.1A2a   |
| 30 0340 0188   | III.1B1  |
| 30 0340 0209   | III.1B2a   |
| 30 0340 0220   | III.1C2b   |
| 30 0340 0233   | III.1C3  |
| 30 0340 0327   | III.1A2  |
| 30 0340 0367   | III.1B2  |
| 30 0340 0412   | III.1C4  |

<sup>a</sup> Payload shipping category notation initiated in June 1999.

<sup>b</sup> Payload shipping category notation used through June 1999.

**TABLE 5 (Continued)**  
**NUMERIC/ALPHA-NUMERIC SHIPPING CATEGORY**  
**NOTATION CROSS CORRELATION**

| <b>Numeric Payload<br/>Shipping Category<sup>a</sup></b> | <b>Alpha-Numeric Payload<br/>Shipping Category<sup>b</sup></b> |
|--|--|
| 30 0340 0506   | III.1A3  |
| 30 0340 0546   | III.1B3  |
| 30 0340 0686   | III.1A4  |
| 30 0340 0725   | III.1B4  |
| 30 0340 0865   | III.1A5  |
| 30 0340 0905   | III.1B5  |
| 30 0340 1044   | III.1A6  |
| 30 0340 1084   | III.1B6  |
|  |  |
| 40 9999 0148   | IV.1A1T  |
| 40 9999 0169   | IV.1A2T  |
| 40 9999 0188   | IV.1B1T  |
| 40 9999 0209   | IV.1B2T  |
| 40 9999 0506   | IV.1A3T  |
| 40 9999 0546   | IV.1B3T  |

<sup>a</sup> Payload shipping category notation initiated in June 1999.

<sup>b</sup> Payload shipping category notation used through June 1999.

**TABLE 6**  
**ALPHA-NUMERIC/NUMERIC SHIPPING CATEGORY**  
**NOTATION CROSS CORRELATION**

| <b>Alpha-Numeric Payload<br/>Shipping Category<sup>a</sup></b> | <b>Numeric Payload<br/>Shipping Category<sup>b</sup></b> |
|--|--|
| I.1A0  | 10 0160 0147   |
| I.1A1  | 10 0160 0168   |
| I.1A2  | 10 0160 0190   |
| I.1A3  | 10 0160 0648   |
| I.2A0  | 10 0130 0147   |
| I.2A1  | 10 0130 0168   |
| I.2A2  | 10 0130 0190   |
| I.2A3  | 10 0130 0648   |
| I.2A4  | 10 0130 0888   |
| I.3A0  | 10 0040 0147   |
| I.3A1  | 10 0040 0168   |
| I.3A2  | 10 0040 0190   |
| I.3A3  | 10 0040 0648   |
| I.3A4  | 10 0040 0888   |
| II.1A0   | 20 0170 0127   |
| II.1A1   | 20 0170 0148   |
| II.1A1f  | 20 0170 0133   |
| II.1A2   | 20 0170 0327   |
| II.1A2a  | 20 0170 0169   |
| II.1A2f  | 20 0170 0143   |
| II.1A2af   | 20 0170 0140   |
| II.1A3   | 20 0170 0506   |
| II.1A3f  | 20 0170 0152   |
| II.1A4   | 20 0170 0686   |
| II.1A5   | 20 0170 0865   |
| II.1A6   | 20 0170 1044   |
| II.2AM   | 20 0000 0000   |
| III.1A0  | 30 0340 0127   |
| III.1A1  | 30 0340 0148   |

<sup>a</sup> Payload shipping category notation used through June 1999.

<sup>b</sup> Payload shipping category notation initiated in June 1999.

**TABLE 6 (Continued)**  
**ALPHA-NUMERIC/NUMERIC SHIPPING CATEGORY**  
**NOTATION CROSS CORRELATION**

| <b>Alpha-Numeric Payload<br/>Shipping Category<sup>a</sup></b> | <b>Numeric Payload<br/>Shipping Category<sup>b</sup></b> |
|--|--|
| III.1A1f   | 30 0340 0133   |
| III.1A2  | 30 0340 0327   |
| III.1A2a   | 30 0340 0169   |
| III.1A2f   | 30 0340 0143   |
| III.1A2af  | 30 0340 0140   |
| III.1A3  | 30 0340 0506   |
| III.1A3f   | 30 0340 0152   |
| III.1A4  | 30 0340 0686   |
| III.1A5  | 30 0340 0865   |
| III.1A6  | 30 0340 1044   |
| IV.1A1T  | 40 9999 0148   |
| IV.1A2T  | 40 9999 0169   |
| IV.1A3T  | 40 9999 0506   |
|  |  |
| I.1B0  | 10 0160 0207   |
| I.1B1  | 10 0160 0229   |
| I.1B2  | 10 0160 0250   |
| I.1B3  | 10 0160 0709   |
| I.2B0  | 10 0130 0207   |
| I.2B1  | 10 0130 0229   |
| I.2B2  | 10 0130 0250   |
| I.2B3  | 10 0130 0709   |
| I.2B4  | 10 0130 0949   |
| I.3B0  | 10 0040 0207   |
| I.3B1  | 10 0040 0229   |
| I.3B2  | 10 0040 0250   |
| I.3B3  | 10 0040 0709   |
| I.3B4  | 10 0040 0949   |
| II.1B0   | 20 0170 0166   |

<sup>a</sup> Payload shipping category notation used through June 1999.

<sup>b</sup> Payload shipping category notation initiated in June 1999.

**TABLE 6 (Continued)**  
**ALPHA-NUMERIC/NUMERIC SHIPPING CATEGORY**  
**NOTATION CROSS CORRELATION**

| <b>Alpha-Numeric Payload<br/>Shipping Category<sup>a</sup></b> | <b>Numeric Payload<br/>Shipping Category<sup>b</sup></b> |
|--|--|
| II.1B1   | 20 0170 0188   |
| II.1B2   | 20 0170 0367   |
| II.1B2a  | 20 0170 0209   |
| II.1B3   | 20 0170 0546   |
| II.1B4   | 20 0170 0725   |
| II.1B5   | 20 0170 0905   |
| II.1B6   | 20 0170 1084   |
| II.2BM   | 20 0000 0000   |
| III.1B0  | 30 0340 0166   |
| III.1B1  | 30 0340 0188   |
| III.1B2  | 30 0340 0367   |
| III.1B2a   | 30 0340 0209   |
| III.1B3  | 30 0340 0546   |
| III.1B4  | 30 0340 0725   |
| III.1B5  | 30 0340 0905   |
| III.1B6  | 30 0340 1084   |
| IV.1B1T  | 40 9999 0188   |
| IV.1B2T  | 40 9999 0209   |
| IV.1B3T  | 40 9999 0546   |
|  |  |
| I.1C0  | 10 0160 0034   |
| I.1C2  | 10 0160 0059   |
| I.1C2b   | 10 0160 0286   |
| I.2C0  | 10 0130 0034   |
| I.3C0  | 10 0040 0034   |
| II.1C0   | 20 0170 0028   |
| II.1C1   | 20 0170 0041   |
| II.1C1f  | 20 0170 0034   |
| II.1C2   | 20 0170 0053   |

<sup>a</sup> Payload shipping category notation used through June 1999.

<sup>b</sup> Payload shipping category notation initiated in June 1999.

**TABLE 6 (Continued)**  
**ALPHA-NUMERIC/NUMERIC SHIPPING CATEGORY**  
**NOTATION CROSS CORRELATION**

| <b>Alpha-Numeric Payload<br/>Shipping Category<sup>a</sup></b> | <b>Numeric Payload<br/>Shipping Category<sup>b</sup></b> |
|--|--|
| II.1C2b  | 20 0170 0220   |
| II.1C2f  | 20 0170 0039   |
| II.1C2bf   | 20 0170 0043   |
| II.1C3   | 20 0170 0233   |
| II.1C3f  | 20 0170 0049   |
| II.1C4   | 20 0170 0412   |
| II.2CM   | 20 0000 0000   |
| III.1C0  | 30 0340 0028   |
| III.1C1  | 30 0340 0041   |
| III.1C1f   | 30 0340 0034   |
| III.1C2  | 30 0340 0053   |
| III.1C2b   | 30 0340 0220   |
| III.1C2f   | 30 0340 0039   |
| III.1C2bf  | 30 0340 0043   |
| III.1C3  | 30 0340 0233   |
| III.1C3f   | 30 0340 0049   |
| III.1C4  | 30 0340 0412   |
|  |  |
| II.1D2   | 20 0170 0067   |
| III.1D2  | 30 0340 0067   |
|  |  |
| II.2E0   | 20 0000 0000   |

<sup>a</sup> Payload shipping category notation used through June 1999.

<sup>b</sup> Payload shipping category notation initiated in June 1999.



**TABLE 7**  
**TERMINOLOGY AND NOTATION**

|  |  |
|--|--|
| <u>85-Gallon Drum Overpack:</u>            | 55-gallon drum overpacked in an 85-gallon drum.  |
| <u>Assay:</u>                              | The observation of spontaneous or stimulated nuclear radiations, interpreted to estimate the content of one or more radionuclides in a material.   |
| <u>Bin:</u>                                | A box with a rectangular configuration. The bin is fitted with at least two filters and overpacked in a standard waste box (SWB).  |
| <u>Bin Overpack:</u>                       | A bin overpacked in an SWB.  |
| <u>CH-TRAMPAC:</u>                         | Contact-Handled Transuranic Waste Authorized Methods for Payload Control (CH-TRAMPAC) is the governing document for shipments in the TRUPACT-II and HalfPACT packagings.   |
| <u>CH-TRUCON:</u>                          | CH-TRU Waste Content Codes (CH-TRUCON) is the document developed to show wastes characterized and grouped together for controlling the payload in accordance with the CH-TRAMPAC.  |
| <u>Chemical Compatibility:</u>             | Assessing the properties of all potential chemicals in a payload container (>1 weight percent), there must be no adverse safety or health hazards produced as a result of any mixtures that could occur.                 |
| <u>Combustible Materials:</u>              | Organic materials that are dominantly cellulosic (e.g., cotton, paper, cloth, wood, etc.), but also includes plastics.   |
| <u>Compressed Gas:</u>                     | Compressed gases are those materials defined as such by Title 49, Code of Federal Regulations (CFR), Part 173.   |
| <u>Contact-Handled TRU (CH-TRU) Waste:</u> | Transuranic waste with a surface radiation dose rate not greater than 200 millirem/hour.   |
| <u>Content Code:</u>                       | A uniform system applied to waste forms to group those with similar characteristics for purposes of shipment. Content code is not to be confused with Item Description Code (IDC).                                       |
| <u>Corrosive Materials:</u>                | Corrosive materials are those defined as such by 40 CFR 261.   |
| <u>Decay Heat:</u>                         | Heat produced by radioactive emissions that are absorbed in the surrounding material.  |
| <u>Explosive Materials:</u>                | Explosive materials are those defined as such by 49 CFR 173.   |
| <u>Filter Vent:</u>                        | A filter vent is defined as filter media manufactured of carbon composite, Kevlar, stainless steel, or any material that enables the filter to meet the minimum performance specifications stipulated in the CH-TRAMPAC. |

**TABLE 7 (Continued)**  
**TERMINOLOGY AND NOTATION**

|  |   |
|--|---|
| <u>Free Liquid:</u>                          | Liquid that is not sorbed on or in a host material such that it could spill or drain from its container.  |
| <u>G Value:</u>                              | The number of molecules of gas species produced per 100 electron volts of decay energy absorbed by the waste.   |
| <u>Glovebox:</u>                             | A sealed box with windows and rubber gloves attached to ports such that an operator's hands and arms are protected as he works inside the box.  |
| <u>Hydrogen Diffusivity:</u>                 | In this document, used to distinguish between different payload container filters authorized for use as indicated in the CH-TRAMPAC. Within the scope of approved payload container filters, as defined in the CH-TRAMPAC, the possible use of filters with different hydrogen diffusivity values results in different possible shipping category assignments for payload containers with otherwise identical packaging configurations. |
| <u>Immobilized Materials:</u>                | Materials that are fixed in a matrix such as glass, ceramic, cement, concrete, etc.   |
| <u>Item Description Code (IDC):</u>          | A site-specific numerical code applied to individual waste forms (including source if applicable) to provide identification which is used for physical segregation and computerized record keeping and tracking.  |
| <u>NaI Drum Counter:</u>                     | Assay performed on drums using sodium iodide crystals as the measurement device in the detector.  |
| <u>Nondestructive Assay:</u>                 | Assay methods for waste items that do not affect the physical or chemical form of the material.   |
| <u>Nondestructive Examination:</u>           | Methods that allow examination of items without affecting the chemical or physical forms of these items. An example is radiography, which provides visible evidence of the contents of payload containers.  |
| <u>Oil-Dri:</u>                              | A trade name for an absorbent material, typically made of clay.   |
| <u>Overpack:</u>                             | An enclosure that is used to provide protection or convenience in handling of a package.  |
| <u>Passive-Active Neutron (PAN) Counter:</u> | A device that measures the radiations that occur spontaneously or naturally (passive) and those that are induced by external irradiation (active) and compares the results of both measurements.  |
| <u>Payload Containers:</u>                   | Containers meeting the requirements in the CH-TRAMPAC.  |
| <u>Pipe Component:</u>                       | A stainless steel container used for packaging specific waste forms within a 55-gallon drum. The pipe component is exclusively used as part of the pipe overpack.   |

**TABLE 7 (Continued)**  
**TERMINOLOGY AND NOTATION**

|  |  |
|--|--|
| <u>Pipe Overpack:</u>                    | A pipe component overpacked in a 55-gallon drum, as specified in the CH-TRAMPAC.   |
| <u>Polyethylene Liners:</u>              | Rigid drum liners molded from high-density polyethylene, typically with a wall thickness of about 0.09 inches (90 mils). The liner may have a snap-on cover of the same material.  |
| <u>Pressurized Vessels (Containers):</u> | Smaller containers in the payload container such as aerosol cans, which may hold compressed gas.   |
| <u>Pu-239 Fissile Gram Equivalent:</u>   | The unit of measure for subcriticality mass limits. The Pu-239 fissile gram equivalent mass is determined by multiplying the mass of each isotope with the isotope's FGE conversion factor and summing the results. The Pu-239 FGE conversion factor is defined as the ratio of the subcritical mass limit of Pu-239 to that of the subject fissile isotope, where the subcritical mass limits are determined as provided in ANSI/ANS-8.1-1998 and ANSI/ANS-8.15-1981. |
| <u>Pyrophoric Materials:</u>             | Pyrophoric materials are defined as those that may ignite spontaneously under the ambient conditions.  |
| <u>Radiochemical Assay:</u>              | Assay performed with wet samples in a radiochemical laboratory using separation techniques.  |
| <u>Segmented Gamma Scanner (SGS):</u>    | An assay device.   |
| <u>Shipping Category:</u>                | <p>A shipping category is defined by the following parameters:</p> <ul style="list-style-type: none"> <li>• Chemical composition of the waste (waste type)</li> <li>• Gas generation potential (G value of the waste material type)</li> <li>• Gas release resistance (type of payload container and type and maximum number of confinement layers used in a packaging configuration of a payload container).</li> </ul>   |

The numeric notation used to describe a shipping category provides a correlation on a per payload container basis to the gas generation potential of the contents and the resistance to gas release of the packaging configuration. The shipping category notation is a ten-digit code:

XX YYYY ZZZZ

where,

XX = The waste type, which indicates the chemical composition of the waste

**TABLE 7 (Continued)**  
**TERMINOLOGY AND NOTATION**

YYYY = The G value, or gas generation potential, of the waste material type multiplied by  $10^2$

ZZZZ = The resistance to hydrogen release of the packaging configuration multiplied by  $10^{-4}$ .

For example, the shipping category assignment for a 55-gallon drum containing solid inorganic waste packaged within two filtered, plastic liner bag layers is:

20 0170 0140

The alpha-numeric shipping category notation was based on the same parameters as the numeric notation, but conveyed the information through a different set of denotations. The alpha-numeric shipping category notation was based on the waste type, the payload container type, and the type and number of confinement layers within a payload container.

X.XYZzz

where,

X.X = The waste material type (which corresponds to a G value)

Y = The type of payload container

Z = The number of confinement layers

zz = The type of confinement layers

For example, the shipping category assignment for a 55-gallon drum containing solid inorganic waste packaged within two filtered, plastic liner bag layers is:

II.1A2af

Tables 5 and 6 correlate the numeric shipping category notations to equivalent alpha-numeric notations. The CH-TRAMPAC details the shipping category classification system.

Small Quantity (SQ): Approximately 20 to 30 sites across the country storing from one to a few hundred drums of TRU waste, as well as small waste streams from larger sites. Shipments of small quantities of waste may demonstrate compliance with the CH-TRAMPAC requirements through the use of a waste-specific data package as described in the CH-TRAMPAC.

Standard Waste Box (SWB): A box with ends designed specifically to fit the packaging.

SWB Overpack: A 55-gallon drum overpacked in an SWB.

**TABLE 7 (Continued)**  
**TERMINOLOGY AND NOTATION**

|   |  |
|---|--|
| <u>Ten-Drum Overpack (TDOP):</u>        | A cylindrical payload container that fits within the inner containment vessel of the TRUPACT-II. Due to its size, the TDOP is not an authorized payload container for the HalfPACT.  |
| <u>Transuranic (TRU) Waste:</u>         | TRU waste is defined as defense waste contaminated with certain alpha-emitting radionuclides in concentrations greater than 100 nanocuries per gram of waste.  |
| <u>Twist and Tape:</u>                  | A method of bag closure for waste consisting of gathering the neck of the bag, twisting tightly, and wrapping tightly with tape, wire, or other material. Often called "horsetail."  |
| <u>Ultrasonic Measurements:</u>         | A nondestructive, metal-thickness-gauging device that uses ultrasonic signal reflection measurements. It is used to verify minimum drum wall thickness in locations judged most likely to be corroded if any corrosion is present inside the drum. |
| <u>Waste Acceptance Criteria (WAC):</u> | Criteria developed for the safe disposal of TRU waste in the WIPP, meeting the long-term disposal requirements of the WIPP.  |
| <u>Waste Certification:</u>             | Activities associated with waste processing and records required to certify that the waste meets the WIPP WAC.   |
| <u>Waste Material Type:</u>             | Further divisions of Waste Types based on flammable gas generation potential (G values).   |
| <u>Waste Type:</u>                      | Waste type refers to physical types of waste such as solidified inorganics, solid inorganics, solidified organics, and solid organics.   |
| <u>Waste Packaging:</u>                 | The process of filling a payload container with waste and remaining within the controls applied to layers of confinement.  |

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**TABLE 8**  
**ACRONYM LIST**

|                    |   |
|--------------------|---|
| °C                 | Degrees Celsius   |
| ALARA              | As low as reasonably achievable   |
| ANL-E              | Argonne National Laboratory-East  |
| ANL-W              | Argonne National Laboratory-West  |
| APT                | Advanced Processing Technology  |
| cfm                | cubic feet per minute   |
| CFR                | Code of Federal Regulations   |
| CH-TRAMPAC         | Contact-Handled Transuranic Waste Authorized Methods for Payload Control (document) |
| CH-TRU             | Contact-handled transuranic (waste)   |
| CH-TRUCON          | CH-TRU Waste Content Codes (document)   |
| CWS                | Chemical Warfare Service (filter)   |
| DDW                | Decontamination and decommissioning waste   |
| DOE                | U. S. Department of Energy  |
| DOT                | U.S. Department of Transportation   |
| EPA                | U.S. Environmental Protection Agency  |
| HDPE               | High-density polyethylene   |
| HEPA               | High-efficiency particulate air (filter)  |
| IDC                | Item description code   |
| in <sup>2</sup>    | square inch(es)   |
| INEEL              | Idaho National Engineering and Environmental Laboratory                             |
| ISAM               | Isotope Separation and Advanced Manufacturing                                       |
| keV                | Kiloelectron volt(s)  |
| LANL               | Los Alamos National Laboratory  |
| lb/ft <sup>3</sup> | pound(s) per cubic foot   |
| LLNL               | Lawrence Livermore National Laboratory  |
| mol/s/mol fraction | mole(s) per second per mole fraction  |
| MOUND              | Mound Laboratory  |
| MSA                | Mine Safety Appliance   |
| <u>N</u>           | Normality   |
| NaI                | Sodium iodine   |
| NTS                | Nevada Test Site  |
| ORNL               | Oak Ridge National Laboratory   |
| PAN                | Passive-active neutron (counter)  |
| PFP                | Plutonium Finishing Plant   |
| PHP                | Plasma hearth process   |
| psia               | Pounds per square inch absolute   |

**TABLE 8 (Continued)**  
**ACRONYM LIST**

|            |   |
|------------|---|
| PUREX      | Plutonium-Uranium Extraction              |
| PVC        | Polyvinyl chloride                        |
| QA         | Quality assurance                         |
| RCRA       | Resource Conservation and Recovery Act    |
| RFETS      | Rocky Flats Environmental Technology Site |
| RGW        | Research generated waste                  |
| RH         | Richland Hanford                          |
| RMWC       | Radioactive Mixed Waste Complex           |
| RTR        | Real-time radiography                     |
| SAR        | Safety Analysis Report                    |
| SED        | Separations Equipment Development         |
| SGS        | Segmented Gamma Scan                      |
| SIS        | Special isotope separation                |
| SNL/CA     | Sandia National Laboratories/California   |
| SQ         | Small quantity                            |
| SRS        | Savannah River Site                       |
| SS         | Special source                            |
| SS&C       | Sand, slag, and crucible                  |
| SWB        | Standard waste box                        |
| SWEPP      | Stored Waste Examination Pilot Plant      |
| TA         | Technical Area                            |
| TDOP       | Ten-drum overpack                         |
| torr       | Torrent(s)                                |
| TRU        | Transuranic                               |
| TRUPACT-II | Transuranic Package Transporter-II        |
| WAC        | Waste Acceptance Criteria                 |
| WIPP       | Waste Isolation Pilot Plant               |



CONTENT CODE: AE 111, AE 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Aqueous Waste

GENERATING SITE: Argonne National Laboratory - East (ANL-E)

WASTE DESCRIPTION: The waste is nonflammable aqueous waste that may contain various organic materials as a trace component (<1%) from research activities and decontamination and decommissioning activities.

GENERATING SOURCES: The waste is generated at various locations at ANL-E.

WASTE FORM: Absorbed/solidified liquids are derived from research activities, decontamination and decommissioning activities, and maintenance or repair activities. Liquids are sorbed and/or solidified using inorganic solidification and/or sorption media (e.g., Aquaset products, cement, vermiculite, etc.). The product is visually inspected for the presence of free liquid after an appropriate set time, and additional sorbent is added, if required, before the liner cover is installed.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| AE 111A<br>AE 211A | Absorbed/solidified liquids are packaged inside a DOT Type A or UN 1A2 55-gallon drum with a rigid plastic drum liner. The cover of the rigid liner has a 0.75-inch minimum diameter hole. The drum is vented using at least one (1) HEPA filter. The drums and liners are inspected before waste is placed in them.<br><br>If the drum is overpacked in an SWB, no closed liner bags are used in the SWB.   |
| AE 111C<br>AE 211C | Absorbed/solidified liquids are packaged inside a DOT Type A or UN 1A2 55-gallon drum with a twist-and-tape plastic drum liner bag and possibly a rigid plastic drum liner. The cover of the rigid liner has a 0.75-inch minimum diameter hole. The drum is vented using at least one (1) HEPA filter. The drums are inspected before waste is placed in them.<br><br>If the drum is overpacked in an SWB, no closed liner bags are used in the SWB. |

ASSAY: The 55-gallon drums or SWBs are assayed by the mobile service vendor as part of the certification for calculating Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

FREE LIQUIDS: The containers will also be examined using RTR to check for the presence of free liquids.

EXPLOSIVES/COMPRESSED GASES: No explosives or compressed gases have been identified in this waste stream and none are foreseen in the future.

PYROPHORICS: No pyrophorics have been identified in this waste stream, and none are foreseen in the future.

CORROSIVES: The pH of the liquids is adjusted to between 4 and 10 before they are solidified.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a filter, and the rigid drum liner has a 0.75-inch minimum diameter hole (0.44 in.<sup>2</sup>). Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: AE 116, AE 216 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Combustible Waste

GENERATING SITE: Argonne National Laboratory - East (ANL-E)

WASTE DESCRIPTION: Solid combustible waste is derived from research activities performed at the laboratory. The waste includes soft plastics, cardboard, rags, paper, cloth, concrete, and laboratory apparatus from various processes.

GENERATING SOURCES: The waste is generated at various locations at ANL-E.

WASTE FORM: Solid combustible and some noncombustible waste is produced by two sources: research generation and decontamination and decommissioning activities. Research-generated waste (RGW) is produced as a by-product from research activities performed in a laboratory environment on a routine basis. Decontamination and decommissioning wastes (DDW) are derived from decontamination and disposal of facilities and ancillary systems (e.g., gloveboxes).

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| AE 116A<br>AE 216A | Waste is placed directly in a can or other rigid container. Can or container lids are closed with a "crimped" or "friction" seal, but the seals are not air-tight. Cans or containers are then placed in a 55-gallon drum lined with a rigid drum liner or are placed directly in an SWB or a TDOP. The waste may also be placed directly in a 55-gallon drum lined with a rigid drum liner, possibly with a lid, in an SWB, or in a TDOP. There are no layers of confinement.  |
| AE 116B<br>AE 216B | Waste is placed directly in a filtered inner bag and then may be placed in a can or other rigid container. Can or container lids are closed with a "crimped" or "friction" seal, but the seals are not air-tight. Packaged waste is then placed in a 55-gallon drum lined with a rigid drum liner, or is placed directly in an SWB or a TDOP. Waste may also be placed directly in a filtered inner bag and then placed in a 55-gallon drum, possibly lined with a rigid drum liner, possibly with a lid, in an SWB, or in a TDOP.  |
| AE 116C<br>AE 216C | Waste is placed directly in an inner bag closed by the twist-and-tape, fold-and-tape, or vented heat-sealed method and then may be placed in a can or other rigid container. Can or container lids are closed with a "crimped" or "friction" seal, but the seals are not air-tight. Packaged waste is then placed in a 55-gallon drum, possibly lined with a rigid drum liner, possibly with a lid, or placed directly in an SWB or a TDOP. Waste may also be placed directly in an inner bag closed by the twist-and-tape, fold-and-tape, or vented heat-sealed method and then placed in a 55-gallon drum lined with a rigid drum liner or placed directly in an SWB or a TDOP. |
| AE 116D<br>AE 216D | All waste is placed in a 55-gallon drum lined with a twist-and-tape or fold-and-tape plastic liner bag and possibly a rigid drum liner, possibly with a lid, or is placed in an SWB or a TDOP lined with a fold-and-tape or filtered plastic liner bag.   |
| AE 116E<br>AE 216E | All waste is placed in a 55-gallon drum lined with a twist-and-tape, fold-and-tape, or a filtered plastic liner bag and possibly a rigid drum liner, possibly with a lid, or is placed in an SWB or a TDOP lined with a filtered plastic liner bag.   |

| Code               | Description*   |
|--------------------|--|
| AE 116F<br>AE 216F | All waste is placed in a 55-gallon drum lined with a twist-and-tape, fold-and-tape, or a filtered plastic liner bag, maximum 1 plastic inner bag closed with a twist-and-tape, fold-and-tape, or a vent filter, and possibly a rigid drum liner, possibly with a lid.      |
| AE 116G<br>AE 216G | All waste is placed in a 55-gallon drum lined with a twist-and-tape, fold-and-tape, and/or a filtered plastic liner bag, maximum 2 plastic inner bags closed with a twist-and-tape, fold-and-tape, or a vent filter, and possibly a rigid drum liner, possibly with a lid. |
| AE 116H<br>AE 216H | All waste is placed in a 55-gallon drum lined with a twist-and-tape, fold-and-tape, and/or a filtered plastic liner bag, maximum 3 plastic inner bags closed with a twist-and-tape, fold-and-tape, or a vent filter, and possibly a rigid drum liner, possibly with a lid. |
| AE 116I<br>AE 216I | All waste is placed in a 55-gallon drum lined with a twist-and-tape, fold-and-tape, and/or a filtered plastic liner bag, maximum 4 plastic inner bags closed with a twist-and-tape, fold-and-tape, or a vent filter, and possibly a rigid drum liner, possibly with a lid. |
| AE 116J<br>AE 216J | All waste is placed in a 55-gallon drum lined with a twist-and-tape, fold-and-tape, and/or a filtered plastic liner bag, maximum 5 plastic inner bags closed with a twist-and-tape, fold-and-tape, or a vent filter, and possibly a rigid drum liner, possibly with a lid. |

\*If drums are overpacked in an SWB, no closed liner bags are used in the SWB. All drums and rigid drum liners are inspected by the Quality Assurance coordinator before they are acceptable for use.

ASSAY: Radionuclide assay may be performed using a segmented gamma scanner (SGS), active-passive neutron (APNEA), and/or the WIT system. The results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error) for each waste package.

The SGS with a density compensator that compensates for the material of the receptacle is routinely checked for accuracy by the nondestructive assay operator who uses sources of U-235 and Pu-239 of known quantities. Accountability records for isotopic distribution in known mixtures of radionuclides are used in conjunction with SGS to calculate isotopic composition.

The APNEA system is designed to measure both the fissile and the spontaneous emitting isotopes in transuranic waste. The isotopic composition must be furnished by gamma-ray spectroscopy. The spontaneous emitting isotope mass is measured by counting the coincident neutrons occurring in helium-3 detectors. The system is calibrated using working reference sources traceable to the New Brunswick Laboratory standards. The fissile isotope mass is measured by actively injecting ten microsecond pulses of  $10^5$  -  $10^6$  neutrons per burst into the waste containing chamber every ten milliseconds. The helium-3 detectors register excess neutrons in the waste from the fissioning from the injected neutrons. The active and passive measurements complement each other and together allow the requirements for the measurement of the TRU waste alpha activity to be assayed for every waste drum in a stream.

The NDA Waste Inspection Technology (WIT) has six high-purity germanium (HPGe) detectors. This system uses the principles of computed tomography (CT) to acquire data in both active (A) and passive (P) CT mode. The active or ACT mode uses six HPGe detectors to map the attenuation characteristics of a waste drum's matrix by recording the attenuation of six  $^{152}\text{Eu}$  sources located opposite the six HPGe detectors. For this measurement, six shutters are opened to permit a 'mapping' of the attenuation as a function of both gamma-ray energy and geometric position within a drum. The passive or PCT mode records the gamma-ray emissions from radioactive sources located within a waste drum in a CT manner. The PCT measurement determines the location and attenuation strength of all detectable sources within a drum. The actual source

strength for all detected sources is obtained by using the waste matrix attenuation 'map' obtained from ACT data to correct the PCT emissions data, e.g., the 413.7-keV Pu-239 gamma-ray.

FREE LIQUIDS: A Solid Radioactive Waste Disposal Requisition is used by the waste generator to document the waste in a filled receptacle. In addition to providing the radionuclides and estimates of each in the waste, the generator must also answer eight waste form questions with either "yes" or "no." The questions include whether or not the waste contains liquids in any form, pyrophoric materials, pressurized vessels, or corrosive materials. If "yes" is answered to any of these questions, the waste stream specialist is alerted that the waste must be reprocessed or it is not certifiable. The containers will also be examined using RTR and/or DR/CT to check for the presence of free liquids.

EXPLOSIVES/COMPRESSED GASES: All pressure vessels and aerosol cans will have the valve removed or will be punctured. As a part of the certification process, all containers undergo NDE and/or VE as verification to the acceptable knowledge to insure explosives/compressed gasses are not a part of the waste.

PYROPHORICS: Pyrophoric materials will be reacted and/or solidified using an inorganic solidification media (e.g., Plaster of Paris, etc.) to render them nonreactive.

CORROSIVES: Corrosive solids will be reacted and/or solidified using an inorganic solidification media (e.g., cement, Plaster of Paris, etc.) to render them nonreactive.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable chemicals for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a vent filter, and the rigid drum liner cover, if present, has a hole about 0.75-inch minimum diameter (0.44-in.<sup>2</sup>). Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: AE 129, AE 229 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Combined Solidified Organics

GENERATING SITE: Argonne National Laboratory - East (ANL-E)

WASTE DESCRIPTION: The waste is solidified/sorbed neutralized aqueous waste and/or solidified/sorbed neutralized organic waste and/or mixtures of neutralized aqueous and organic waste. The waste may contain debris materials (metal, paper, plastic, cement, inorganic solids, etc.) from research activities and decontamination and decommissioning activities. The waste may be in containers or bags with twist-and-tape closure or in sealed containers or bags with volumes smaller than 4 liters.

GENERATING SOURCES: The waste is generated at various locations at ANL-E.

WASTE FORM: The waste is discrete solid items and/or containers, up to 55-gallon drums, of solidified/immobilized liquid waste. The liquid waste is solidified by mixing it with an inorganic solidification and/or sorption media (e.g., Aquaset products, cement, vermiculite, etc.).

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description   |
|--------------------|---|
| AE 129A<br>AE 229A | <p>The waste is packaged inside a DOT Type A or UN 1A2 55-gallon drum with or without a rigid plastic liner. The cover of the drum liner, if present, has a 0.75-inch minimum diameter hole. No sealed plastic bags or sealed containers greater than 1 gallon are used. The waste also may be placed directly inside an SWB or a TDOP, neither of which contains a liner bag. The containers are inspected before waste is placed in them.</p> <p>If the drum is overpacked in an SWB, no closed liner bags are used in the SWB.</p>                                 |
| AE 129B<br>AE 229B | <p>The waste is packaged inside a twist-and-tape plastic inner bag and then placed in a DOT Type A or UN 1A2 55-gallon drum with or without a rigid plastic liner. The cover of the drum liner, if present, has a 0.75-inch minimum diameter hole. The waste also may be placed directly inside a twist-and-tape plastic inner bag and then placed in an SWB or a TDOP, neither of which contains a liner bag. The containers are inspected before waste is placed in them.</p> <p>If the drum is overpacked in an SWB, no closed liner bags are used in the SWB.</p> |

ASSAY: The 55-gallon drums, SWBs, or TDOPs are assayed using a passive/active neutron and gamma spectroscopy system for calculating Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error). This is supplemented by radiological characterization information provided by the waste generator.

FREE LIQUIDS: The debris items will be visually inspected to verify that there are no free liquids. Liquids are sorbed and/or solidified using inorganic solidification and/or sorption media (e.g., Aquaset products, cement, vermiculite, etc.) and visually verified to contain no free liquids. The solidified product is visually inspected for the presence of free liquid and additional sorbent is added, if required, before the liner cover is installed.

EXPLOSIVES/COMPRESSED GASES: All pressure vessels and aerosol cans will have the valve removed or will be punctured. A piece of metal will be placed through the opening in punctured containers to facilitate verification that the container is not sealed using RTR.

PYROPHORICS: Pyrophoric materials will be reacted and/or solidified using an inorganic solidification media (e.g., cement, Plaster of Paris, etc.) to render them nonreactive.

CORROSIVES: The pH of the liquids is adjusted to between 4 and 10 before they are solidified. Corrosive solids will be reacted and/or solidified using an inorganic solidification media (e.g., cement, Plaster of Paris, etc.) to render them nonreactive.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type IV.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid is fitted with a filter and the top of the rigid plastic drum liner has a 0.75-inch minimum diameter hole. Each SWB is fitted with at least two (2) and up to four (4) filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: AW 111, AW 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Solidified Aqueous or Homogeneous Inorganic Solids

STORAGE SITE: Argonne National Laboratory-West and Lockheed-Martin Idaho Radioactive Waste Management Complex; both located at the Idaho National Engineering and Environmental Laboratory.

GENERATING SITE: Argonne National Laboratory-West (ANL-W)

WASTE DESCRIPTION: This waste consists primarily of sample preparation and analysis expendables such as liquid acids and bases that are neutralized and then solidified. Other materials such as solidified scrubber liquid, solidified coolant liquid from sample coring operations, and solidified decontamination liquids may also be included. The radioactive constituents are dispersed in a relatively homogeneous matrix.

GENERATING SOURCES: The waste originates from Buildings 704, 720, 752, 765, 774, 775, 776, 785, and 787 at ANL-W.

WASTE FORM: The waste originates as a liquid stream, which is then neutralized to a pH of 5 to 9 and then solidified in polyethylene bottles or metal cans with Aquaset or Petroset-type products, or absorbed in diatomaceous earth.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| AW 111A<br>AW 211A | Containers of solidified waste will be collected in a plastic bag inside a glovebox or other confinement, and the bag will be closed by twisting and taping or folding and taping. Each plastic bag of waste will then be bagged out of the glovebox or other confinement into the payload container liner bag. The liner bag will then be closed by twisting and taping. For drums, the liner bag may be placed on the inside or outside of a rigid, punctured HDPE drum liner, depending on which glovebox the waste comes from. Some filled, liner bags are placed in HDPE liners and some are placed directly into drums. Drums without liners will be overpacked in SWBs. For SWBs, bagged waste will be placed into an SWB liner bag which will be closed by folding and taping. |

ASSAY: Waste contents and or packaging configurations will be assayed using passive gamma methods (SGS), nuclear material accountability information, and/or radiochemical analysis, where possible. The assay results of the input stream may be used to conservatively estimate the assay values for each payload container. The results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error) for each waste package.

FREE LIQUIDS: Packaging procedures will prohibit free liquids. Compliance to this criterion will be controlled by independent verification prior to closure.

EXPLOSIVES/COMPRESSED GASES: Packaging procedures will prohibit explosives and compressed gases. Compliance to this criterion will be controlled by independent verification prior to closure.

PYROPHORICS: Packaging procedures will prohibit pyrophorics. Compliance to this criterion will be controlled by independent verification prior to closure.

CORROSIVES: Packaging procedures will prohibit corrosives. Compliance to this criterion will be controlled by independent verification prior to closure.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: Rigid HDPE liners will be present in all drums that are not overpacked in an SWB. In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured with a hole at least 1/3 inch in diameter or be installed with an equivalent filter vent. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: AW 121, AW 221 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Organic Solid Waste

STORAGE SITE: Argonne National Laboratory-West and Lockheed-Martin Idaho Radioactive Waste Management Complex; both located at the Idaho National Engineering and Environmental Laboratory.

GENERATING SITE: Argonne National Laboratory-West (ANL-W)

WASTE DESCRIPTION: This waste consists primarily of surface-contaminated, solid organic materials such as plastics, paper, cloth, rubber gloves, and Lexan (from glovebox windows). It may also contain oil absorbed in Petroset-type materials and materials included in the solid inorganic content code (AW 122/AW 222) that are not segregated from the organic materials. These wastes are generated in various gloveboxes, hot cells, and other confinements at ANL-W during repackaging, characterizing, handling, sampling and/or analyzing of feed materials and/or process residuals, and during decontamination and modification of facilities.

GENERATING SOURCES: The waste originates from Buildings 704, 720, 752, 765, 774, 775, 776, 785, and 787 at ANL-W.

WASTE FORM: The waste form consists of solid organic materials such as plastics, paper, cloth, etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description   |
|--------------------|---|
| AW 121A<br>AW 221A | Waste will be collected in a plastic bag inside a glovebox or other confinement, and the bag will be closed by twisting and taping or folding and taping. Sharp items may be taped inside or outside of their first layer of plastic to prevent bag tearing. Each plastic bag of waste will then be bagged out of the glovebox or other confinement, into the payload container liner bag. The bag-out method will use heat-sealing to close the liner bags. All bags will contain at least one filter vent. For drums, the liner bag may be placed on the inside or outside of a rigid, punctured HDPE drum liner, depending on which glovebox the waste comes from. For SWBs, bagged waste will be placed into an SWB liner bag, which will be heat-sealed. |
| AW 121B<br>AW 221B | Waste items generated in or transferred into a glovebox will be segregated, and bagged out of the glovebox or other confinement into the payload container liner bag. Sharp items may be taped to prevent bag tearing. The bag-out method will use heat-sealing to close the liner bag, which will contain at least one filter vent. For drums, the liner bag may be placed on the inside or outside of a rigid, punctured HDPE drum liner, depending on which glovebox the waste comes from. For SWBs, waste will be placed into an SWB liner bag, which will be heat-sealed and filtered with one filter vent.  |

| Code               | Description  |
|--------------------|--|
| AW 121C<br>AW 221C | The waste is collected in a plastic bag inside a glovebox or other confinement, and the bag is closed by twisting and taping or folding and taping. Some items are placed in vented metal cans (1-30 gallon) instead of plastic bags. Sharp items may be taped inside or outside of their first layer of plastic to prevent bag tearing. Each plastic bag or metal can of waste is then bagged out of the glovebox or other confinement into the payload container liner bag, which is then closed by twisting and taping. This liner bag constitutes the second layer of confinement for the waste. For drums, the liner bag may be placed on the inside or outside of a rigid, punctured HDPE drum liner, depending on which glovebox the waste comes from. Some filled liner bags are placed directly into drums; the drums without liners will be overpacked in an SWB. For SWBs, bagged waste is placed into an SWB liner bag, which is closed by folding and taping. |

ASSAY: Waste contents and or packaging configurations will be assayed using passive gamma methods (SGS), nuclear material accountability information, and/or radiochemical analysis, where possible. The assay results of the input stream may be used to conservatively estimate the assay values for each payload container. The results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error) for each waste package.

FREE LIQUIDS: Packaging procedures will prohibit free liquids. Compliance to this criterion will be controlled by independent verification prior to closure.

EXPLOSIVES/COMPRESSED GASES: Packaging procedures will prohibit explosives and compressed gases. Compliance to this criterion will be controlled by independent verification prior to closure.

PYROPHORICS: Packaging procedures will prohibit pyrophorics. Compliance to this criterion will be controlled by independent verification prior to closure.

CORROSIVES: Packaging procedures will prohibit corrosives. Compliance to this criterion will be controlled by independent verification prior to closure.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: Rigid HDPE liners will be present in all drums that are not overpacked in an SWB. In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured with a hole at least 1/3 inch in diameter or be installed with an equivalent filter vent. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: AW 122, AW 222 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Inorganic Solid Waste

STORAGE SITE: Argonne National Laboratory-West and Lockheed-Martin Idaho Radioactive Waste Management Complex; both located at the Idaho National Engineering and Environmental Laboratory

GENERATING SITE: Argonne National Laboratory-West (ANL-W)

WASTE DESCRIPTION: This waste consists of surface-contaminated (and for some constituents, like slag, homogeneously dispersed in the matrix) inorganic materials. The waste is primarily process residuals from the high-temperature PHP thermal treatment demonstration, consisting of glassy slag, metal, and refractory material. Other wastes in this content code may also include solid inorganic wastes generated during repackaging, characterizing, handling, sampling and/or analyzing of feed materials and/or process residuals from various facilities at ANL-W. Examples of this latter type include tools, inorganic filter components, metal and glass containers, and sample preparation expendables.

GENERATING SOURCES: The waste originates from Buildings 704, 720, 752, 765, 774, 775, 776, 785, and 787 at ANL-W.

WASTE FORM: The PHP process residuals consist primarily of slag (oxides of Si, Al, Fe, Ca, Na, K, Mg), refractory (oxides of Al, Si, Cr, Mg), and reduced metal alloys. Potential solid inorganic waste items in this content code, such as contaminated instruments like hot plates, balances, or thermocouple wires, come from other gloveboxes at ANL-W.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| AW 122A<br>AW 222A | Waste will be packaged directly into metal cans, ranging in size from 1 quart up to 55 gallons. Metal cans 4 liters and larger in volume will be vented. The metal cans may be placed in plastic bags or be placed directly into the payload container. Drums will contain a punctured, rigid HDPE drum liner, unless they are overpacked into an SWB. If the pipe overpack is used, waste will be placed directly into the pipe component, and the pipe components will be overpacked into drums.   |
| AW 122B<br>AW 222B | The waste will be collected in a plastic bag that contains one filter inside a glovebox or other confinement, and the bag will be closed by twisting and taping or folding and taping. Sharp items may be taped inside or outside of their first layer of plastic to prevent bag tearing. Each plastic bag of waste will then be bagged out of the glovebox or other confinement into the payload container liner bag. The bag-out method will use heat-sealing to close the liner bags, which will contain at least one filter vent. This liner bag constitutes the second layer of confinement for the waste. For drums, the liner bag may be placed on the inside or outside of a rigid, punctured HDPE drum liner, depending on which glovebox the waste comes from. For SWBs, bagged waste will be placed into an SWB liner bag that will be heat-sealed and filtered with one filter vent. |

| Code               | Description  |
|--------------------|--|
| AW 122C<br>AW 222C | Waste items generated in or transferred into a glovebox will be segregated and bagged out of the glovebox or other confinement into the payload container liner bag. Sharp items may be taped to prevent bag tearing. The bag-out method will use heat-sealing to close the liner bag, which will contain at least one filter vent. This liner bag constitutes the single layer of confinement for the waste. For drums, the liner bag may be placed on the inside or outside of a rigid, punctured HDPE drum liner, depending on which glovebox the waste comes from. For SWBs, waste will be placed into an SWB liner bag that will be heat-sealed and filtered with one filter vent.  |
| AW 122D<br>AW 222D | The waste will be collected in a plastic bag inside a glovebox or other confinement, and the bag will be closed by twisting and taping or folding and taping. Sharp items may be taped inside or outside of their first layer of plastic to prevent bag tearing. Each plastic bag of waste will then be bagged out of the glovebox or other confinement into the payload container liner bag, which will then be closed by twisting and taping. Several small bags may be placed inside one liner bag. For drums, the liner bag may be placed on the inside or outside of a rigid, punctured HDPE drum liner, depending on which glovebox the waste comes from. For SWBs, bagged waste will be placed into an SWB liner bag that will be closed by folding and taping. |

ASSAY: Waste contents and or packaging configurations will be assayed using passive gamma methods (SGS), nuclear material accountability information, and/or radiochemical analysis, where possible. The assay results of the input stream may be used to conservatively estimate the assay values for each payload container. The results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error) for each waste package.

FREE LIQUIDS: Packaging procedures will prohibit free liquids. Compliance to this criterion will be controlled by independent verification prior to closure.

EXPLOSIVES/COMPRESSED GASES: Packaging procedures will prohibit explosives and compressed gases. Compliance to this criterion will be controlled by independent verification prior to closure.

PYROPHORICS: Packaging procedures will prohibit pyrophorics. Compliance to this criterion will be controlled by independent verification prior to closure.

CORROSIVES: Packaging procedures will prohibit corrosives. Compliance to this criterion will be controlled by independent verification prior to closure.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: Rigid HDPE liners will be present in all drums that are not overpacked into an SWB. In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured with a hole at least 1/3 inch in diameter or be installed with an equivalent filter vent. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: AW 125, AW 225 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Combustible and Noncombustible Wastes

STORAGE SITE: Argonne National Laboratory-West and Lockheed-Martin Idaho Radioactive Waste Management Complex; both located at the Idaho National Engineering and Environmental Laboratory.

GENERATING SITE: Argonne National Laboratory-West (ANL-W)

WASTE DESCRIPTION: This content code is a combination of the waste described in the ANL-W content codes AW 121C/221C (solid organics), AW 122/222 (inorganic solid waste), and AW 111A/211A (solidified aqueous or homogeneous inorganic solids), packaged together in the same payload container.

GENERATING SOURCES: The waste originates from Buildings 704, 720, 752, 765, 774, 775, 776, 785, and 787 at ANL-W.

WASTE FORM: This waste is a combination of waste forms in ANL-W content codes AW 121C/221C, AW 122/222, and AW 111A/211A.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code   | Description   |
|--|---|
| AW 125A<br>AW 225A<br><br>AW 125AF<br>AW 225AF | The waste is collected in a glovebox bag-out sleeve or a plastic bag, closed by twisting and taping. Each waste sleeve or plastic bag is then placed in a filtered metal container. The waste package is then placed into a payload container liner bag inside the payload container. When full, the liner bag is closed by twisting and taping. (This liner bag constitutes the third layer of confinement for the waste.) Most filled liner bags are placed in HDPE liners, and a few are placed directly into drums. Drums without liners will be overpacked in an SWB.              |
| AW 125B<br>AW 225B                             | The waste is collected in a glovebox bag-out sleeve or a plastic bag, closed by twisting and taping. Each waste sleeve or plastic bag is then placed in a second plastic bag, twisted and taped. The waste package is then placed into a payload container liner bag inside the payload container. When full, the liner bag is closed by twisting and taping. (This liner bag constitutes the third layer of confinement for the waste.) Most filled liner bags are placed in HDPE liners, and a few are placed directly into drums. Drums without liners will be overpacked in an SWB. |

ASSAY: Waste contents and or packaging configurations will be assayed using passive gamma methods (SGS), nuclear material accountability information, and/or radiochemical analysis, where possible. Assay results of the input stream may be used to conservatively estimate assay values for each payload container.

FREE LIQUIDS: Packaging procedures prohibit free liquids. Compliance to this criteria will be controlled by process knowledge, analyses, and/or visual verification.

EXPLOSIVES/COMPRESSED GASES: Packaging procedures prohibit explosives and compressed gases. Compliance to this criteria will be controlled by process knowledge, analyses, and/or visual verification.

PYROPHORICS: Packaging procedures prohibit pyrophorics. Compliance to this criteria will be controlled by process knowledge, analyses, and/or visual verification.

CORROSIVES: Packaging procedures prohibit corrosives. Compliance to this criteria will be controlled by process knowledge, analyses, and/or visual verification.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: Rigid HDPE liners will be present in all drums that are not overpacked in an SWB, and the liner will be punctured with a hole at least 1/3 inch in diameter or be installed with an equivalent filter vent. Each drum will be fitted with one filter, and each SWB will be fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: AW 127, AW 227 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Combined Solid Organics, Solid Inorganics, and Solidified Inorganics

STORAGE SITE: Argonne National Laboratory-West and Lockheed-Martin Idaho Radioactive Waste Management Complex; both located at the Idaho National Engineering and Environmental Laboratory.

GENERATING SITE: Argonne National Laboratory-West (ANL-W)

WASTE DESCRIPTION: This content code is a combination of the waste described in the ANL-W content codes AW 121C/221C (solid organics), AW 122/222 (inorganic solid waste), and AW 111A/211A (solidified aqueous or homogeneous inorganic solids), packaged together in the same payload container. These waste streams are generally packaged in glovebox cleanup campaigns.

GENERATING SOURCES: The waste originates from Buildings 704, 720, 752, 765, 774, 775, 776, 785, and 787 at ANL-W.

WASTE FORM: This waste is a combination of the waste forms in ANL-W content codes AW 121C/221C, AW 122/222, and AW 111A/211A.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description   |
|--------------------|---|
| AW 127A<br>AW 227A | The waste is collected in a plastic bag inside a glovebox or other confinement, and twisted and taped or folded and taped. Each plastic bag of waste is then bagged out of the glovebox or other confinement into the payload container liner bag. The liner bag is then closed by twisting and taping. This liner bag constitutes the second layer of confinement for the waste. Some filled, liner bags are placed in HDPE liners and some are placed directly into drums. Drums without liners will be overpacked in an SWB. |

ASSAY: Waste contents and or packaging configurations will be assayed using passive gamma methods (SGS), nuclear material accountability information, and/or radiochemical analysis, where possible. The assay results of the input stream may be used to conservatively estimate the assay values for each payload container. The results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error) for each waste package.

FREE LIQUIDS: Packaging procedures prohibit free liquids. Compliance to this criterion will be controlled by process knowledge, analysis, and/or visual verification.

EXPLOSIVES/COMPRESSED GASES: Packaging procedures prohibit explosives and compressed gases. Compliance to this criterion will be controlled by process knowledge, analysis, and/or visual examination.

PYROPHORICS: Packaging procedures prohibit pyrophorics. Compliance to this criterion will be controlled by process knowledge, analysis, and/or visual verification.

CORROSIVES: Packaging procedures prohibit corrosives. Compliance to this criterion will be controlled by process knowledge, analysis, and/or visual verification.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: Rigid HDPE liners will be present in all drums that are not overpacked in an SWB. In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured with a hole at least 1/3 inch in diameter or be installed with an equivalent filter vent. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: ID 111, ID 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Aqueous Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: (ID 111A/211A, ID 111B/211B, ID 111C/211C, ID 111D/211D) Rocky Flats Environmental Technology Site (RFETS)

(ID 111MA/211MA, ID 111MB/211MB, ID 111MC/211MC, ID 111MD/211MD) Mound Laboratory (Mound)

WASTE DESCRIPTION: (ID 111A/211A, ID 111C/211C) This RFETS waste consists of aqueous effluent generated from Buildings 374 and 774 and other uranium and plutonium processing activities at RFETS. The wet sludge is mixed with approximately 30% volume Portland cement or with absorbents such as Oil-Dri to absorb any free liquid.

(ID 111B/211B) This waste consists of sludge generated from the scrubber in the plutonium recovery incinerator in Building 771 at RFETS. Portland cement was used to absorb liquids in the sludge.

(ID 111D/211D) This waste consists of absorbed or cemented sludges generated from RFETS uranium and plutonium processing activities.

(ID 111MA/211MA) Aqueous effluent is generated from plutonium processing and recovery operations primarily from the Plutonium Processing (PP) Building at Mound and processed in the Waste Solidification facility. Absorbent is added to eliminate any free liquid.

(ID 111MB/211MB) Wastewater from Pu-238 processing areas is treated to adjust pH level and is put through a standard batch type precipitation process in the Waste Disposal (WD) Building at Mound. Processed waste is in the form of a metal hydroxide sludge, which is mixed with Portland cement to absorb any free liquids.

(ID 111MC/211MC) This waste has been generated from U-234 separation projects performed in the Semi-Works and Research (SW/R) Buildings at Mound. Approximately 0.16 gallon of either acidic or caustic waste is absorbed on 1.5 pounds of Florco absorbent in half-gallon plastic bottles.

(ID 111MD/211MD) This waste consists of absorbed and cemented Mound wastes described in codes ID 111MA/211MA and ID 111MC/211MC that have been opened for inspection and/or sampling. The waste has been mixed with cement or absorbent has been added to eliminate any detected free liquids.

GENERATING SOURCES: (ID 111A/211A, ID 111C/211C) The waste originated from uranium and plutonium processing activities at RFETS, primarily in Buildings 374 and 774.

(ID 111B/211B) The waste originated from Building 771 at RFETS.

(ID 111D/211D) The waste originated from uranium and plutonium processing areas at RFETS, including Buildings 374, 771, and 774.

(ID 111MA/211MA) The waste originated from the PP Building, also called Building 38, and its predecessor, the Special Metallurgical (SM) Building at Mound.

(ID 111MB/211MB) The waste was generated from the WD Building but contains materials originating from the PP Building, SW/R Buildings, Laundry, and WD Building at Mound.

(ID 111MC/211MC) The waste was generated from the SW/R Buildings at Mound.

(ID 111MD/211MD) The waste originated from the PP Buildings or the SW/R Buildings at Mound.

WASTE FORM:

(ID 111A/211A, ID 111C/211C) Sludges from chemical processing of aqueous wastes were produced by adjusting for pH level and adding a flocculating agent to precipitate radioactive elements such as plutonium and americium. The slurry was filtered to produce a wet sludge. Portland cement was added to ensure absorption of any free liquids. Sludge was removed from tanks that collected liquid effluent from floor drains or from laundry tanks and consisted of dirt, sand, gravel, floor sweepings, lint, spent detergents, and similar materials. The sludge was mixed with Portland cement and/or Aquaset to ensure absorption of any free liquids.

(ID 111B/211B) The sludge consists of fly-ash and diatomite filter media. The sludge's consistency may range from a damp mass with a consistency of paste, to a mass that has been dried to some extent and may contain fines. Portland cement was used as an absorbent for liquids in the sludge.

(ID 111D/211D) This waste consists of solidified sludges described in ID 111A/211A and ID 111C/211C that have been repackaged as a result of examination and/or sampling. Absorbents have been added to eliminate any detected free liquids.

(ID 111MA/211MA) Aqueous liquids were transferred to a holding tank and placed under a vacuum to ensure suspension of plutonium throughout the batch. After sparging, the liquid was absorbed on vermiculite, Florco, Autodri, or Sorbal. Wastes packaged after 1976 used only Florco absorbent clay at a ratio of approximately 10 gallons of liquid to 150 pounds of Florco.

(ID 111MB/211MB) Wastewater was treated with calcium chloride, amorphous carbon, and sodium hydroxide. The treated water was then pumped into a clariflocculator and the precipitate collected as a sludge. Approximately 40 gallons of dewatered sludge were homogeneously mixed with 2 to 2.5 bags of Portland cement in a prepared 55-gallon drum that was allowed to cure for 24 hours before installing the drum lid. The physical form of the waste is a solid block or plug of hardened cement in a drum.

(ID 111MC/211MC) Approximately 0.16 gallon of aqueous liquid was absorbed on 1.5 pounds of Florco absorbent in half-gallon plastic bottles. The bottles were allowed to cure for a minimum of 16 hours before closing the bottle. Bottles generated prior to February 1982 contain either acidic or caustic waste. Acidic liquids generated in February 1982 and beyond were neutralized and combined with caustic liquids prior to absorption.

(ID 111MD/211MD) Acidic and caustic wastes generated from the processes described in ID 111MA/211MA and ID 111MC/211MC were repackaged as a result of examination, sampling, and/or treating. Absorbents or Portland cement have been added to eliminate any detected free liquids.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

WASTE PACKAGING DESCRIPTION TABLE

| Code                 | Description*   |
|----------------------|--|
| ID 111A<br>ID 211A   | <p>The cemented sludge is placed in a 55-gallon drum which is lined with an HDPE liner, 14-mil PVC O-ring bag, and a 5-mil polyethylene bag. While the polyethylene bag is not required from a waste packaging standpoint, it aids in contamination control.</p> <p>Uncemented and second-stage sludge and wet sludge from Building 374 have all been packaged by adding the sludge to a prepared waste drum that contained Portland cement for absorption of liquid. In 1972, use of 90-mil polyethylene drum liners began. The drum liner was lined with two drum bags. Each drum bag and the liner contained a layer of Portland cement at the bottom. The inner drum bag was filled with sludge and taped shut. Another layer of cement was placed over the top of the sealed bag, and the second drum bag was taped shut over the top of that configuration. A layer of Oil-Dri was placed over the outer sealed bag, and the lid was placed on the 90-mil liner. Prior to use of the 90-mil liner, the same configuration was used without the liner. A layer of Portland cement was added to the bottom of the 55-gallon drum and Oil-Dri was usually not used over the top of the outer drum bag.</p> <p>Process sludge from Building 776 and laundry sludge was shoveled out of each tank and placed in a 55-gallon drum with a 90-mil liner and one or two drum bags. Portland cement was added to each drum and mixed into the sludge with a paddle. The bags were sealed, the lid was placed on the liner and the drum was sealed.</p> |
| ID 111B<br>ID 211B   | <p>The incineration sludge is packaged in plastic bags, 1-gallon metal paint cans, or 2 to 4 liter Nalgene bottles. The containers are double-bagged and placed into prepared 55-gallon drums lined with a 90-mil polyethylene drum liner and one or two drum bags. Prior to 1972, the same configuration may have been used without the 90-mil liner.</p> <p>The cemented incinerator sludge pucks were bagged out of the glovebox and placed into prepared 55-gallon drums lined with a 90-mil polyethylene drum liner. Several configurations of drum bags, o-ring bags, and plastic bags were used to prepare the 55-gallon drums. Any combination of plastic bags (i.e., polyethylene round bottom drum liner, or 2 polyethylene drum bags, 1 PVC o-ring bag and 1 polyethylene bag) were used with a maximum of four layers of confinement.</p>  |
| ID 111C<br>ID 211C   | ID 111A/211A packaging configuration (up to four 55-gallon containers) packaged directly into an SWB or (up to ten 55-gallon containers) packaged directly into a TDOP.  |
| ID 111D<br>ID 211D   | Containers of cemented and absorbed sludge generated from RFETS plutonium and uranium processing activities (ID 111A/211A, ID 111B/211B, and ID 111C/211C) are opened for examination and/or sampling. Absorbents are added if any free liquids are detected. Solidified wastes and spent samples are direct loaded into a 55-gallon drum, SWB, or TDOP with one liner bag.  |
| ID 111MA<br>ID 211MA | The absorbed liquid is placed in a 55-gallon drum, which is lined with a 90-mil thick rigid polyethylene liner. In some cases, when small amounts of waste are disposed, the waste and absorbent are placed in 1-, 2-, or 4-liter plastic bottles, which are placed in a 5-gallon drum. The drum liner is lined with a polyethylene drum bag. After addition of the liquid waste and the time allowed for solidification, the drum bag is sealed with tape and the rigid drum liner lid installed. Plywood spacers (0.25- to 0.75-inch thick) are placed between the rigid liner lid and the drum lid before the drum lid is installed. The rigid liner lid is punctured with a minimum 0.3-inch hole or an equivalent filter.   |

| Code                 | Description*   |
|----------------------|--|
| ID 111MB<br>ID 211MB | Each 55-gallon drum is lined with a 90-mil rigid polyethylene liner. The sludge/cement mixture is added to the drum and mixed. After the sludge/cement mixture has cured, the rigid drum liner lid is installed. Plywood spacers (0.25- to 0.75-inch thick) are placed between the rigid liner lid and the drum lid. The drum lid is then installed. The rigid liner lid is punctured with a minimum 0.3-inch hole or an equivalent filter. If waste containers are opened for examination, sampling, and/or treatment, the solidified wastes may be directly loaded into an SWB or TDOP with one liner bag. |
| ID 111MC<br>ID 211MC | Each sealed plastic half-gallon bottle of absorbed aqueous waste is placed in a plastic bag, which is taped shut. Up to 45 of the bags are placed in a 55-gallon drum that is lined with a 90-mil rigid polyethylene liner and may also be lined with a polyethylene drum bag.   |
| ID 111MD<br>ID 211MD | Waste containers described in ID 111MA/211MA and ID 111MC/211MC are opened for examination, sampling, and/or treatment. Absorbents are added if any free liquids are detected. Solidified wastes are direct loaded into an SWB or TDOP, with one liner bag.  |

- \* 1. If drums are overpacked in SWBs, TDOPs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB, TDOP, or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC.  
 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB or TDOP is considered to be a direct loaded SWB or TDOP. No liner bags will be used in the SWB or TDOP.

ASSAY: Each drum is evaluated using a Drum Assay System (DAS) to determine the amount and identity of the radionuclides (plutonium, americium, and uranium) in the sludge. The results of the analysis are expressed in terms of grams for each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

FREE LIQUIDS: (ID 111A, ID 111B, ID 111C, ID 111D) TRU solidified aqueous waste is cast into a solid by adding Portland cement, diatomite and sludge in a controlled process per procedure. The aqueous sludge is initially two-thirds water and is processed into a solid with no free liquids. Visual examination and waste certification inspection of process parameters ensures that operation controls produce a solid cast. The RTR examination may be performed to ensure that free liquids have not developed after the drum was closed.

(ID 211A, ID 211B, ID 211C, ID 211D) The waste was wet when packaged. Portland cement was added to absorb any free liquid. Absence of free liquids is verified by RTR and the site sampling programs for certified waste. Minor residual liquids (<1% volume) are permitted.

(ID 111MA/211MA, ID 111MC/211MC) Mound procedures ensure that sufficient absorbent is used to eliminate the possibility of liquid in containers. Visual examination or RTR examination ensures that free liquids have not developed prior to container certification.

(ID 111MB/211MB) Portland cement is added to absorb any free liquids or moisture. The visual examination or RTR examination ensures that free liquids have not developed prior to container certification.

(ID 111MD/211MD) Absorbent or Portland cement is added during examination, sampling, and/or repackaging to absorb any free liquids detected in the waste.

EXPLOSIVES/COMPRESSED GASES: (ID 111A, ID 111B, ID 111C, ID 111D) The waste is produced in a closed system, which precludes the introduction of extraneous materials such as pressure vessels or explosives. No explosives, explosive mixtures or compressed gases have been identified in this waste. Explosives are prohibited at RFETS.



(ID 211A, ID 211B, ID 211C, ID 211D) No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the site sampling programs for certified waste.

(ID 111MA/211MA, ID 111MB/211MB, ID 111MC/211MC, ID 111MD/211MD) The solidified waste has been analyzed and found to contain no explosive items or explosive compounds or material capable of forming explosive mixtures. Areas where TRU waste is generated typically contain no explosive wastes. Mound administrative controls were in place that precluded the introduction of explosives and cylinders of compressed gases into the waste containers. Aerosol cans were punctured before being discarded as waste.

PYROPHORICS: (ID 111A, ID 111B, ID 111C, ID 111D) No pyrophoric materials have been identified in this content code. Pyrophorics are prohibited by waste packaging procedures.

(ID 211A, ID 211B, ID 211C, ID 211D) Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the site sampling programs for certified waste.

(ID 211MA/211MA, ID 111MC/211MC, ID 111MD/211MD) No pyrophoric materials have been identified in this waste.

(ID 111MB/211MB) No pyrophoric materials have been identified in this waste. The solidification operation assures that any small quantities of pyrophorics that might be present are rendered safe by dispersion in the concrete matrix.

CORROSIVES: (ID 111A, ID 111B, ID 111C, ID 111D) No corrosive materials have been identified in this waste. Precipitated sludges are chiefly hydroxides with a pH of 10 to 12. Using the criteria for corrosivity in 40 CFR 261, this sludge would not be a corrosive.

(ID 211A, ID 211B, ID 211C, ID 211D) No corrosive materials have been identified by waste characterization. Absence of corrosive materials is verified by the site sampling programs for certified waste.

(ID 111MA/211MA, ID 111MB/211MB, ID 111MC/211MC, ID 111MD/211MD) The waste either does not contain corrosive material, or all corrosive materials are neutralized or treated to render them nonreactive or have been removed from the waste prior to or during the waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types I.1 (ID 111MA/211MA, ID 111MC/211MC, and ID 111MD/211MD) and I.2 (ID 111A/211A, ID 111B/211B, ID 111C/211C, ID 111D/211D, and ID 111MB/211MB) in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and/or unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured, equipped with an equivalent filter, or used without a lid. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: ID 112, ID 212 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Organics

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: (ID 112) Waste organic liquids are transferred to Building 774 at RFETS for cementation. The liquids (oil and/or solvents) are mixed with gypsum cement (Envirostone) and packaged. (ID 212) The organic setups consist of liquid organic wastes such as trichloroethane, oils, carbon tetrachloride, trichloroethylene, tetrachloro-ethylene, etc., that have been mixed with calcium silicate to form a grease or paste-like material. Small amounts of Oil-Dri are usually mixed with the waste.

GENERATING SOURCE: ID 112 waste originated from Building 774 at RFETS. ID 212 organic wastes are generated by various plutonium and nonplutonium areas at RFETS and are processed at the Aqueous Waste Treatment facility.

WASTE FORM:

(ID 112) The organics and gypsum cement are mixed together within a 55-gallon drum prepared as described below. The oil/solvent mixtures may contain machining oil, lathe coolant, carbon tetrachloride, 1,1,1-trichloroethane and 1,1,2-trichloro-1,2,2-trifluoroethane. The waste laboratory solvents contain chloroform or a mix of chloroform and xylene.

(ID 212) The organic waste consists of degreasing agents such as trichloroethane, lathe coolant (machining oil and carbon tetrachloride), and other organics such as trichloroethylene, tetrachloroethylene, and trace concentrations of organic laboratory waste such as organophosphates, nitrobenzene, etc. Some of the degreasing solvents are contaminated with beryllium.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code    | Description*  |
|---------|---|
| ID 112A | The cemented liquid is mixed and cured in a 55-gallon drum which is lined with an HDPE liner, 14-mil PVC O-ring bag and a 5-mil polyethylene bag. While the polyethylene bag is not required from a waste packaging standpoint, it aids in contamination control.   |
| ID 212A | The liquid organic waste was processed for disposal by blending 30 gallons of organic with 100 pounds of calcium silicate in a continuous mixer to form a solid-like paste or grease. Small amounts (10 to 20 pounds) of Oil-Dri were usually mixed with the waste. The solidified grease was added to a 55-gallon drum that contains two plastic drum bags. Each drum bag has a 4-pound layer of Oil-Dri at the bottom. The 55-gallon drum also has a 4-pound layer of Oil-Dri at the bottom. More Oil-Dri or vermiculite was sometimes added to the outer bag. Since approximately 1972, the drums were lined with a 90-mil rigid polyethylene liner that was lined with the two plastic drum bags. |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: (ID 112) The laboratory solvents are containerized and assayed prior to shipment to Building 774. The results of the radiochemical assays for bottled waste liquid are totaled and assigned to the appropriate drum. The oil/solvent mixture is transferred to Building 774 via pipeline from waste tanks in other buildings. The contents of each tank are assayed radiochemically to determine the amount of radionuclides in the liquid. The liquids are transferred to Building 774 in batches of less than 200 grams Pu-239 fissile equivalent. The assay results for the batch are equally divided among all of the drums of cemented waste produced from that batch. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error). (ID 212) Each waste drum is assayed by PAN assay. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error)

FREE LIQUIDS: (ID 112) TRU solidified organic waste is cast into a solid by mixing gypsum cement with the organic waste in a controlled process per procedure. Waste certification inspection of process parameters ensures that operational controls produce a solid cast. The RTR examination ensures that free liquids have not developed after the waste package was closed. (ID 212) Waste may have been damp when packaged. Oil-Dri was added to absorb any free liquid. Absence of free liquids is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1% volume) are permitted.

EXPLOSIVES/COMPRESSED GASES: (ID 112) No explosives, explosive mixtures, or compressed gases have been identified in this waste. (ID 212) No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste.

PYROPHORICS: (ID 112) No pyrophoric materials have been identified in this content code. Pyrophorics are prohibited by waste packaging procedures. (ID 212) Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste.

CORROSIVES: (ID 112) No corrosive materials have been identified in this waste. Since the waste is organic, there is no corresponding pH. (ID 212) No corrosive materials have been identified by waste characterization. Absence of corrosive materials is verified by the INEEL Sampling Program for SWEPP-certified waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type IV.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: ID 113, ID 213 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Laboratory Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: (ID 113) Aqueous laboratory wastes that are not compatible (e.g., strong acids or bases) with the primary aqueous treatment system are neutralized and solidified. The final waste form is obtained by mixing portland and magnesia cement with the waste. (ID 213) The waste consists of solidified liquid waste containing complexing chemicals, such as chelating agents, that are absorbed in a cement mixture. All liquid is made basic before adding it to the cement mixture.

GENERATING SOURCES: ID 113 waste originated from Building 774 at RFETS. ID 213 solidified laboratory waste was generated by various operations in plutonium recovery and was processed by Aqueous Waste Treatment.

WASTE FORM:

(ID 113) The liquid waste is accumulated in bottles and, after chemical and radiochemical assay, is transferred to Building 774. The bottles are segregated into batches of 80-100 liters and less than 200 grams fissile material. The pH of the waste is adjusted to be slightly basic, and then the waste is added to the premixed (portland and magnesia) cement mixture in the drum.

(ID 213) The waste consists of solidified liquids that contain plutonium complexing chemicals such as alcohols, organic acids, and chelating agents such as EDTA (ethylenediaminetetraacetic acid).

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code    | Description*   |
|---------|--|
| ID 113A | The cemented liquid is placed in a 55-gallon drum which is lined with an HDPE liner, 14-mil PVC O-ring bag and a 5-mil polyethylene bag. While the polyethylene bag is not required from a waste packaging standpoint, it aids in contamination control. |
| ID 213A | The cemented sludge is placed in a 55-gallon drum which is lined with a 90-mil thick HDPE liner, a 14-mil PVC O-ring bag and a 5-mil polyethylene bag.   |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: (ID 113) As described under waste form, the laboratory waste is assayed radiochemically. The results of the assays are totaled and assigned to the appropriate drum. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error). (ID 213) A sample of the sludge from each drum is taken to determine the amount and identity of the radionuclides (plutonium, americium and uranium) in the sludge. The sludge sample is analyzed using a radiochemical assay. Or the drum may be assayed using a PAN counter. The results of the analysis are expressed in terms of grams of

each radionuclide present for each gram of sludge. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: (ID 113) TRU solidified laboratory waste is cast into a solid by mixing with portland and magnesia cement with the neutralized laboratory waste in a controlled process per procedure. Waste certification inspection of process parameters ensures that operational controls produce a solid cast. RTR examination ensures that free liquids have not developed after the drum was closed. (ID 213) Absence of free liquids is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquid (<1% volume) are permitted.

EXPLOSIVES/COMPRESSED GASES: (ID 113) No explosives, explosive mixtures or compressed gases have been identified in this waste. (ID 213) The waste is produced in a closed system which precludes the introduction of extraneous materials such as pressure vessels or explosives. No explosives, explosive mixtures or compressed gases have been identified in this waste. Explosives are prohibited at RFETS.

PYROPHORICS: No pyrophoric materials have been identified in this content code. Pyrophorics are prohibited by waste packaging procedures.

CORROSIVES: (ID 113) The pH of the liquid waste is adjusted to be slightly basic prior to solidification. No corrosives are included in this content code. (ID 213) No corrosive materials have been identified by waste characterization. The basic liquid wastes (pH < 12.5) are reacted with cement and immobilized. Absence of corrosive materials is verified by the INEEL Sampling Program for SWEPP-certified waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type IV.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: ID 114, ID 214 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Solidified Inorganic Process Solids

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: (ID 114A/214A) Rocky Flats Environmental Technology Site (RFETS); (ID 114MA/214MA, ID 114MCD/214MCD) INEEL

WASTE DESCRIPTION: (ID 114A/214A) All particulate and sludge-type wastes that are generated and containerized during plutonium recovery operations are solidified with Portland cement. The resultant waste is designated inorganic cemented process solids. The waste may contain miscellaneous tramp metal, bits of unburned feed material, and carbon from the incomplete oxidation of feed material during incineration. Examples of the wastes are filter sludge, incinerator sludge, soot, grit, and firebrick fines. (ID 114MA/214MA) The waste consists of retrievably-stored homogeneous solids and soil/gravel waste that is treated by incineration, then microencapsulated in grout. The treated waste product consists of microencapsulated ash. (ID 114MCD/214MCD) The waste consists of retrievably stored, inorganic debris (e.g., metal, glass, graphite, firebrick, etc.) that is first compacted and then may be macroencapsulated in grout.

GENERATING SOURCES: (ID 114A/214A) The waste originates from Buildings 371 and 771 at RFETS. (ID 114MA/214MA, ID 114MCD/214MCD) The waste material originates from the Advanced Mixed Waste Treatment Facility located at the RWMC at INEEL.

WASTE FORM:

(ID 114A/214A) The waste consists of incinerator ash and sludge, soot, sand, slag, and crucible heels, immobilized into a solid monolith or “pucks” by mixing in 1-gallon molds with a Portland cement mixture. The cement mixture used varies by procedure with the type of waste being cemented.

(ID 114MA/214MA) Retrievably-stored organic homogeneous solids, inorganic homogeneous solids and soil/gravel waste are incinerated to remove any organic material. The ash and residual incombustible matter are then mixed with cement powders (Portland cement, pulverized fuel ash) and water in a mixer (in-line mixing). The ash-grout mixture is poured into a payload container where it is allowed to cure and solidify. Or, by using an alternate method of processing, ash, cement powders, and water are loaded into a payload container, then mixed in the container using a sacrificial mixing paddle that remains in the payload container (in-drum mixing). With either method, the final waste form is a solidified monolith of inorganic material. Water and cement used to make the grout mixture are considered part of the final waste matrix.

(ID 114MCD/214MCD) All debris waste to be compacted is examined by radiography and, if necessary, sorted into 55-gallon transfer drums. During this radiography/sorting operation, prohibited materials are identified and segregated and organic debris is sorted/segregated from inorganic debris. Drums containing inorganic debris are supercompacted into pucks. Pucks are then placed into puck drums (i.e., approximately 100-gallon drums) that are equipped with internal spacers at the bottom and sides to stabilize pucks as they are loaded. Finally, grout may be poured around the compacted pucks inside the puck drums.

**WASTE PACKAGING:** Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code                   | Description   |
|------------------------|---|
| ID 114A<br>ID 214A     | <p>The cemented pucks are double-bagged out of the glovebox and then placed into a 55-gallon drum lined with up to two drum bags, which are twisted and taped closed. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC.</p> <p>If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.</p>  |
| ID 114MA<br>ID 214MA   | <p>Both in-line and in-drum processes use a specially designed 55-gallon drum for a payload container. The drum has a dual lid (inner and outer) configuration for bagless transfer of the waste mixture out of the glovebox containment where it was processed. In the in-line mixing process, the homogeneous, fluid mixture of ash and grout is discharged into a double lid 55-gallon drum mated to the bagless transfer glovebox port. After the drum is filled, a filter vented inner lid is snapped into place, and the drum is taken away from the glovebox. The mixture is allowed to solidify, and the 55-gallon drum is closed with a conventional filter vented lid held in place by a clamp ring. The packaging configuration does not include any plastic layers of confinement. Filters placed on both the inner and outer lids have a hydrogen diffusivity greater than or equal to <math>3.7 \times 10^{-6}</math> moles/second/mole fraction.</p> <p>The drums, lids, and closing sequence that are used in the in-drum mixing process are identical, except that the large, loop-shaped paddle remains in the drum after stirring the ash-grout mixture.</p> <p>Microencapsulated ash product drums may be overpacked into an SWB or a TDOP if any nonconformance in packaging cannot be corrected. No sealed liner bags will be used with drums overpacked in an SWB or a TDOP.</p>   |
| ID 114MCD<br>ID 214MCD | <p>Inorganic debris is contained in or placed into 55-gallon drums. These drums are then punctured to allow for gas release and supercompacted to reduce their volume and breach any and all plastic layers of confinement. Several compacted pucks are loaded into a specially designed, approximately 100-gallon drum (puck drum). The puck drum is the payload container, having the same height as a 55-gallon drum, but a larger diameter to accommodate compacted pucks and optional encapsulating grout. The puck drum has a dual lid (inner and outer) configuration for bagless transfer of the compacted pucks out of the glovebox containment where they were processed.</p> <p>After the pucks are loaded, a filter vented inner lid is snapped into place, and the outer filter vented metal lid is placed on the puck drum and secured with a clamp ring. The packaging configuration does not contain any plastic layers of confinement. Filters placed on both the inner and outer lids have a hydrogen diffusivity greater than or equal to <math>3.7 \times 10^{-6}</math> moles/second/mole fraction.</p> <p>Prior to installation of the inner lid, a fluid mixture of cement grout may be poured around the stack of pucks for the purposes of macroencapsulation. The grout formulation and/or application will allow for hydrogen gas release through or around the grout to prevent accumulation of hydrogen inside the macroencapsulated waste. After the grout has set, the outer lid is installed.</p> |

ASSAY: (ID 114A/214A) Prior to cementation, each bottle of particulates or sludge is assayed with an SGS counter. The assays of the individual containers are totaled to determine the amount of radionuclides in each drum. The results are displayed in grams of radionuclides per drum. (ID 114MA/214MA) Loose ash for a single product drum is metered into an assay chamber from a large ash mixing hopper. This metered batch of ash is radioassayed using gamma spectrometry or similar approved assay technique. When the measurement is complete, the ash is discharged from the assay chamber into either an in-line grout mixer or a product drum, where it is mixed with water and cement to make the final product. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error). (ID 114MCD/214MCD) Each 55-gallon drum to be compacted is assayed, prior to compaction, using PAN counting, gamma energy analysis measurement techniques, and/or other approved assay method(s). These assay results remain valid after the drum is compacted into a puck. The total quantity and isotopic distribution of radioactive material contained in a puck drum is calculated by appropriately summing the assay results for each of the compacted pucks packaged into the payload container. These results are then used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: (ID 114A/214A) The cemented waste is inspected prior to packaging to ensure that no free liquids are present. The absence of free liquids is verified by RTR examination. (ID 114MA/214MA) The high temperature of the thermal process (i.e., incineration) used in the treatment of the incoming waste material ensures that the waste feed for microencapsulation contains no free liquids. The microencapsulation process is tightly controlled to preclude the presence or formation of free liquid after microencapsulation. Radiography may be performed on a statistical sample of the microencapsulated drums produced to confirm the absence of unacceptable free liquid. (ID 114MCD/214MCD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of unacceptable free liquid in the waste material prior to compaction. The macroencapsulation process is tightly controlled to preclude the presence or formation of free liquid after macroencapsulation. Radiography is performed on a statistical sample of macroencapsulated drums produced to verify the absence of unacceptable free liquid.

EXPLOSIVES/COMPRESSED GASES: (ID 114A/214A) Explosives are prohibited at RFETS. Explosives and compressed gases are prohibited by waste packaging procedures. The RTR examination ensures no pressurized containers are present. (ID 114MA/214MA) The high temperature of the thermal process (i.e., incineration) used in the treatment of the incoming waste material ensures that the final waste product contains no explosives and/or compressed gases. (ID 114MCD/214MCD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of explosives and compressed gases.

PYROPHORICS: (ID 114A/214A) Pyrophorics would be rendered innocuous by the solidified cement matrix. Pyrophorics are prohibited by waste packaging procedures. (ID 114MA/214MA) The high temperature of the thermal, oxidative process (i.e., incineration) used in the treatment of the incoming waste material ensures that the final waste product contains no pyrophoric material. (ID 114MCD/214MCD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of pyrophoric material.

CORROSIVES: (ID 114A/214A) No corrosive materials have been identified in this waste. Corrosive materials are prohibited by waste packaging procedures. (ID 114MA/214MA) The high temperature of the thermal, oxidative process (i.e., incineration) used in the treatment of the incoming waste material ensures that the final waste product contains no corrosive material. (ID 114MCD/214MCD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of corrosive material

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.3 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each inner and outer drum lid is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine and up to ten filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: ID 115, ID 215 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Graphite Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: (ID 115) Discarded graphite from plutonium casting and laboratory operations. (ID 215) The waste consists of graphite waste generated from plutonium foundry operations, recovery processes, and analytical procedures.

GENERATING SOURCES: ID 115 waste originated from Buildings 371, 374, 559, 707, 771 and 776 at RFETS. ID 215 RFETS graphite waste was primarily generated by Foundry Operations (Building 707), Plutonium Recovery Operations (Building 771 and 371) and the Size Reduction Facility (Building 776). Limited amounts of graphite waste were also generated by research and development projects.

WASTE FORM:

(ID 115) Broken graphite molds and graphite furnace equipment or graphite chunks and pieces from mold cleaning and declassification. Discarded laboratory equipment is also included in this content code.

(ID 215) RFETS-generated graphite waste consists of broken graphite molds from plutonium casting operations, graphite spacers and liners used in high-temperature furnaces and ovens, and graphite pieces and chunks generated from mold cleaning ("scarfing") operations.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code    | Description*   |
|---------|--|
| ID 115A | The graphite waste is placed directly into a 55-gallon drum or double-bagged (two PVC bags or one PVC and one polyethylene bag) prior to loading. The drum is lined with an HDPE liner and 14-mil O-ring PVC bag. The PVC bag may have a polyethylene bag around it for contamination control purposes. A fiberboard liner is placed between the waste bags and the drum liners for puncture protection.   |
| ID 215A | Graphite molds were broken into pieces, double-bagged, and placed directly into a lined 55-gallon drum. Graphite pieces and chunks were placed in a 13-inch high by 15.5-inch diameter cardboard Fibre-Pak and bagged out of the glovebox in up to two plastic bags. Two Fibre-paks will fit into each prepared waste drum. Graphite chunks may also have been collected in ½ or 1-gallon polyethylene bottles, and graphite scarfings were collected in 1-gallon polyethylene bottles before being bagged out of the glovebox line. After removal from the glovebox, the waste was placed in a lined 55-gallon drum containing up to two liner bags that were twisted and taped closed. |

| Code                   | Description*  |
|------------------------|---|
| ID 215A<br>(continued) | <p><u>1970-1972:</u> Each 55-gallon drum was lined with up to two plastic bags. Depending on generating location, the inner bag may be lined with a cardboard liner. After filling with waste, each bag was closed with tape.</p> <p><u>1972-Present:</u> Each 55-gallon drum was lined with a 90-mil rigid polyethylene drum liner. The drum liner was lined with up to two plastic drum bags. Depending on generating location, a cardboard liner may be placed inside the inner drum bag. After filling with waste, each bag was closed with tape. The rigid liner lid and drum lid were then installed.</p> |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: The waste drums may be assayed by SGS or PAN counters. The results are recorded in grams of the radionuclides present in the drum. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

FREE LIQUIDS: (ID 115) Graphite waste contains no free liquid. Direct inspection of the waste by RTR of the drum contents ensures that no free liquid is present in the waste package. (ID 215) The waste was dry when packaged. Absence of residual liquids (<1% volume) is verified by RTR and the INEEL Sampling Program for SWEPP-certified TRU waste.

EXPLOSIVES/COMPRESSED GASES: (ID 115) Explosives are prohibited at RFETS. Pressurized containers may not be packaged with this content code. RTR examination of each waste package ensures that pressurized containers are excluded from the waste. (ID 215) No explosives or compressed gases have been identified by characterization of these waste streams. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified TRU waste.

PYROPHORICS: (ID 115) Graphite waste contains no pyrophoric material other than discard levels of radionuclides. Other pyrophorics are prohibited by waste packaging procedures. (ID 215) Nonradioactive materials have not been identified by characterization of waste streams. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified TRU waste.

CORROSIVES: (ID 115) No corrosive materials are used in conjunction with graphite at RFETS. Also, corrosives are prohibited by waste packaging procedures. (ID 215) No corrosive materials have been identified by characterization of waste streams. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified TRU waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each drum is vented at

the Drum Venting Facility. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: ID 116, ID 216 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Combustible Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists of a variety of combustible wastes such as paper, rags, cloth, coveralls, plastic, rubber, cardboard, wood, and other similar items.

GENERATING SOURCES: (ID 116A, ID 116D/216D) Waste originated from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779 at RFETS. (ID 216A, ID 116B/216B, ID 116C/216C) Waste originated from the RFETS and was generated at all of the plutonium areas.

WASTE FORM:

(ID 116A, ID 116D/216D) The waste consists mainly of cloth and paper products from cleanup of gloveboxes and spills. It may also include other combustible items as mentioned in the waste description section.

(ID 216A, ID 116B/216B, ID 116C/216C) The combustible waste may contain dry, damp or moist solids. The solid materials consist of paper; rags; plastics such as polyethylene, PVC, and Teflon; surgeons' gloves; cloth overalls and booties; cardboard; wood in the form of lumber; plywood sheeting; filter frames; ladders; empty polyethylene bottles; laundry lint; Kimwipes; canvas; sample vials; respirator facemasks; etc. Some of the combustibles may be coated with paint. Old wet combustible waste generated prior to 1975 contains nitric acid in trace quantities.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| ID 116A            | The waste is either loaded directly into a drum or removed from the glovebox line contained in two PVC bags or a PVC and a polyethylene bag. The bagged waste is then placed into a 55-gallon drum which is lined with an HDPE liner and a 14-mil PVC O-ring bag or a 14-mil polyethylene round bottom liner or both.  |
| ID 216A            | The wet combustible and wood wastes were double-contained in plastic when removed from the glovebox. Some wastes (wet combustibles) were placed in polyethylene bottles (less than or equal to one gallon) and then double bagged out of the glovebox. The waste drums packaged since 1972 contain a 90-mil liner that is lined with one or two drum bags. Waste drums packaged prior to the use of the 90-mil liners were lined with one or two drum bags. Absorbent material (Oil-Dri, Portland cement, vermiculite, etc.) was added to the waste if any residual liquids were suspected. Some other packaging configurations may have been used depending on where the waste was generated, but none were more restrictive to hydrogen aspiration than the packaging methods listed here. |
| ID 116B<br>ID 216B | This waste (plastic, paper, etc.) was placed directly into a 55-gallon drum with 90-mil liner and one or two drum bags or, prior to 1972, a 55-gallon drum without the 90-mil liner but lined with one or two drum bags. Absorbent material was added if any residual liquids were suspected in the waste.   |

| Code               | Description*  |
|--------------------|---|
| ID 116C<br>ID 216C | The dry combustible and plastic wastes were triple-contained in plastic when removed from the glovebox. Some wastes (dry combustibles) were placed in polyethylene bottles (less than or equal to one gallon) and then double bagged out of the glovebox. The waste drums packaged since 1972 contain a 90-mil liner that is lined with one or two drum bags. Waste drums packaged prior to the use of the 90-mil liners were lined with one or two drum bags. Absorbent material (Oil-Dri, Portland cement, vermiculite, etc.) was added to the waste if any residual liquids were suspected. Some other packaging configurations may have been used depending on where the waste was generated, but none were more restrictive to hydrogen aspiration than the packaging methods listed here. |
| ID 116D<br>ID 216D | The waste accumulated in drums may be dumped into an SWB. Each bag of waste is opened prior to placement in the SWB. The SWB is lined with one 14-mil PVC liner. All liner bags are closed by taping along the folds.   |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: The content code may be assayed on an SGS counter, a PAN drum counter, or a non-transmission corrected NaI drum counter. The results are expressed as grams of radionuclides per individual drum. For SWBs, the drum assays are totaled to determine the amount of radionuclides in each box. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

FREE LIQUIDS: (ID 116A, ID 116D/216D) Liquids are prohibited by procedure from being placed in the waste package. The waste packaging procedure also instructs that absorbents (e.g., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the drum is closed. RTR examination of the sealed waste package is performed as a conclusive verification that no unacceptable free liquids are present. (ID 216A, ID 116B/216B, ID 116C/216C) The waste was usually dry when packaged. If any moisture was detected, absorbent such as Oil-Dri, Portland cement, vermiculite, or clay was added. Absence of free liquids was verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1% volume) are permitted.

EXPLOSIVES/COMPRESSED GASES: (ID 116A, ID 116D/216D) Explosives are prohibited at RFETS. Pressurized containers are prohibited by packaging procedures. RTR examination of all waste packages provides verification that no pressurized containers are present. (ID 216A, ID 116B/216B, ID 116C/216C) No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste.

PYROPHORICS: (ID 116A, ID 116D/216D) No pyrophorics have been identified in this content code. Pyrophorics are prohibited by waste packaging procedures. (ID 216A, ID 116B/216B, ID 116C/216C) Nonradioactive pyrophoric materials have not been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste.

CORROSIVES: (ID 116A, ID 116D/216D) Corrosives are prohibited by waste packaging procedures. (ID 216A, ID 116B/216B, ID 116C/216C) No corrosive materials have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: ID 117, ID 217 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Metal Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: (ID 117A/217A, ID 117F/217F) The waste consists of non-pyrophoric waste metals (e.g., iron, copper, aluminum, beryllium chips, stainless steel, tungsten, lead and tantalum.) (ID 117B/217B) This waste consists of metal filters, equipment, crucibles, funnels, and billets of a zinc-magnesium alloy. Naturally occurring salt, clay (bentonite) and wire screen (steel) have been added to the payload containers for experimental purposes. (ID 117C/217C, ID 117E/217E) This waste consists of a variety of noncompressible and noncombustible items such as filters, metal equipment, hand tools, furnace brick, metal crucibles, and funnels, etc. (ID 117D/217D) This waste contains billets of a zinc-magnesium alloy.

GENERATING SOURCES: The ID 117A/217A and ID 117F/217F waste originated from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779 at RFETS. The ID 117B/217B and ID 117D/217D metal waste was generated by the Process Chemistry and Development group at RFETS. The ID 117C/217C and ID 117E/217E waste was generated from all of the RFETS plutonium areas.

WASTE FORM:

(ID 117A/217A, ID 117F/217F) The waste form includes items such as gloveboxes, used shielding, tools, crucibles, machinery and empty containers. The items that are difficult to reduce to a size that would fit in a drum are placed in SWBs.

(ID 117B/217B) The waste contains small billets of zinc-magnesium (10 to 30% magnesium) alloy metal used in a research and development salt cleanup project.

(ID 117C/217C) The waste includes non-SS metals such as iron, copper, aluminum, and primarily stainless steel. The waste is in the form of small hand tools, valves, trays, clamps, pipes, etc. This metal waste has been processed by hot water washing for plutonium recovery. The light metal waste consists of non-line and line-generated metal wastes in the form of gloveboxes, glovebox windows, furnaces, piping, angle iron, tanks, respirator filters, ultrasonic cleaners, control panels, electronic instrumentation, vacuum sweepers, pumps, motors, trays, hotplates, empty cans, power tools, hand tools, etc.

(ID 117D/217D) The waste contains small billets of zinc-magnesium (10 to 30% magnesium) alloy metal used in a research and development salt cleanup project.

(ID 117E/217E) The metal waste contains used tantalum crucibles, funnels, funnel inserts, and pour-rods. Other metals such as tungsten, platinum, and lead were also included.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

WASTE PACKAGING DESCRIPTION TABLE

| Code               | Description*  |
|--------------------|---|
| ID 117A<br>ID 217A | The waste is either loaded directly into a drum or removed from the glovebox line contained in two PVC bags or a PVC and a polyethylene bag. The bagged waste is then placed into a 55-gallon drum that is lined with an HDPE liner and a 14-mil PVC O-ring bag or a 14-mil polyethylene round bottom liner or both. A fiberboard liner is placed between the waste and the drum liners for puncture protection.  |
| ID 117B<br>ID 217B | All inner bags of containment immediately around the waste are punctured or breached prior to closure of the large liner bags in drums, SWBs, or experimental bins. The waste is packaged in a maximum of two large liner bags in a payload container.  |
| ID 117C<br>ID 217C | After leaching of the light non-SS metal waste, the metal was allowed to dry and double-bagged prior to placement in a 55-gallon drum that was lined with up to three polyethylene drum bags and a cardboard liner. Since approximately 1972, the 55-gallon drum was lined with a 90-mil liner that was then lined with up to three plastic drum bags and a cardboard liner. The light metal waste was usually triple-contained in plastic before being placed in a prepared 55-gallon drum. Any sharp metal edges were usually taped before packaging. Non line-generated wastes were usually placed directly into the prepared 55-gallon drum. The 55-gallon drums were lined with one or two plastic drum bags. Since approximately 1972, the drums were lined with a 90-mil rigid polyethylene liner that was lined with the two plastic drum bags. |
| ID 117D<br>ID 217D | Billets of the zinc-magnesium alloy were individually packaged in a produce can, and the can lid was sealed on the can with a roll seam. Each can was contained in double plastic bags and then placed into a Vollrath can. The can was then placed into a 55-gallon drum that contained a 90-mil rigid polyethylene liner that was lined with one or two plastic drum bags.  |
| ID 117E<br>ID 217E | Prior to removal of the waste from the glovebox, all sharp edges were taped. The items were then double bagged from the glovebox and placed in a Fibre-Pak. The Fibre-Pak was then placed into a 55-gallon drum that was lined with one or two plastic drum bags. Since approximately 1972, the drums were lined with a 90-mil rigid polyethylene liner that was lined with the two plastic drum bags.  |
| ID 117F<br>ID 217F | The waste accumulated in drums may be dumped into an SWB. The outer and inner bags are opened prior to placement in the SWB. The SWB is lined with a 14-mil PVC liner. For stripout operations, the metal waste is wrapped in several layers of PVC sheeting and then placed in the SWB. For waste leaving the Advanced Size Reduction Facility, the metal is loaded directly into the SWB with an additional 14-mil PVC liner. A liner (made of metal or wood) is inserted between the waste and the inner PVC liner to support the PVC liner during loading. A fiberboard liner is placed between the waste and the PVC liner for puncture protection. All bag liners are closed by taping along the folds.   |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: The drums may be assayed on an SGS counter or a PAN counter. The results are expressed as grams of radionuclides per individual drum. The assays of the individual containers are totaled to determine the amount of radionuclides in each drum or bin. SWBs are assayed using a PAN crate counter. For SWBs and bins that contain waste dumped from drums, the drum assays are totaled to calculate the amount of radionuclides in each waste box. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

FREE LIQUIDS: (ID 117A/217A, ID 117F/217F) Liquids are prohibited by procedure from being placed in the waste package. The waste packaging procedure also instructs that absorbents (e.g., Oil-Dri) be packed

with moist or damp waste to absorb any liquids that may desorb after the package is closed. RTR examination of the waste package is performed as a conclusive verification that no unacceptable free liquids are present. (ID 117B/217B, ID 117D/217D) The waste was dry when packaged. Absence of free liquids is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1 volume %) are permitted. (ID 117C/217C, ID 117E/217E) The waste was usually dry when packaged. If any moisture was detected, absorbent such as Oil-Dri, Portland cement, vermiculite, or clay was added. Absence of free liquids is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1% volume) are permitted.

EXPLOSIVES/COMPRESSED GASES: (ID 117A/217A, ID 117F/217F) Explosives are prohibited at RFETS. Pressurized containers are vented prior to placement in a waste package. (ID 117B/217B, ID 117C/217C, ID 117D/217D, ID 117E/217E) No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and/or the INEEL Sampling Program for SWEPP-certified waste and during reprocessing of waste.

PYROPHORICS: (ID 117A/217A, ID 117F/217F) Pyrophorics are prohibited by waste packaging procedures. (ID 117B/217B, ID 117C/217C, ID 117D/217D, ID 117E/217E) Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste and during reprocessing of waste.

CORROSIVES: (ID 117A/217A, ID 117F/217F) Packaging procedures require that all corrosive materials must be neutralized or removed from the metal waste prior to packaging. (ID 117B/217B, ID 117C/217C, ID 117D/217D, ID 117E/217E) No corrosive materials have been identified by waste characterization. Absence of corrosive materials is verified by the INEEL Sampling Program for SWEPP-certified waste and during reprocessing of waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. Each bin is fitted with at least two filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: ID 118, ID 218 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Glass Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: (ID 118A/218A, ID 118E/218E) The waste consists of glass and ceramic waste from recovery, maintenance, and laboratory operations at RFETS. (ID 118B/218B) This waste consists of leached glass neutron absorbers (Raschig rings) and a variety of other glass waste. Naturally occurring salt, clay (bentonite), and wire screen (steel) have been added to the payload containers for experimental purposes. (ID 118C/218C) Leached glass neutron absorbers (Raschig rings). (ID 118D/218D) A variety of waste glass from laboratory glassware to glass equipment.

GENERATING SOURCES: (ID 118A/218A, ID 118E/218E) The waste originated from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779 at RFETS. (ID 118B/218B, ID 118C/218C, ID 118D/218D) The glass waste was generated by all of the plutonium processing areas.

WASTE FORM:

(ID 118A/218A, ID 118E/218E) The waste form includes items such as Raschig rings (borosilicate glass - neutron poison), ceramic crucibles, glovebox windows, laboratory glassware, process equipment and empty containers, as well as glass sample vials and bottles.

(ID 118B/218B) The Raschig rings are borated glass rings approximately 1.75 inches high by 1.50 inches in diameter with a wall thickness of approximately 0.25 inches.

(ID 118C/218C) The waste is in the form of glass Raschig rings. The Raschig rings are borated glass rings approximately 1.75 inches high by 1.50 inches in diameter with a wall thickness of approximately 0.25 inch.

(ID 118D/218D) The waste is in the form of glass sample vials, bottles, equipment such as ion exchange columns and dissolver pots, laboratory glassware such as flasks and beakers, and glovebox windows.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| ID 118A<br>ID 218A | The glass is either loaded directly into a drum or removed from the glovebox line contained in two PVC bags or a PVC and a polyethylene bag. In addition, the waste may be collected in a metal can or polyethylene bottle (one gallon or less) that would then be removed from the line wrapped within the two bags. The bagged waste is then placed into a 55-gallon drum that is lined with an HDPE and a 14-mil PVC O-ring bag or a 14-mil polyethylene round bottom liner or both. The drums have a fiberboard liner placed between the waste and the container liners for puncture protection. |
| ID 118B<br>ID 218B | All inner bags of containment immediately around the waste are punctured or breached prior to closure of the large liner bags in drums, SWBs, or experimental bins. The waste is packaged in a maximum of two drum liner bags in a payload container.  |

| Code               | Description*  |
|--------------------|---|
| ID 118C<br>ID 218C | Contaminated Raschig rings were removed from a liquid storage tank and leached. The rings were allowed to air dry before repackaging. The leached Raschig rings were contained in up to three plastic bags and placed in a Fibre-Pak. The Fibre-Pak was then placed in a 55-gallon drum with a 90-mil rigid liner (depending on the packaging date) and one or two drum bags.   |
| ID 118D<br>ID 218D | The glass was packaged in several different ways. Whole or broken glass may have been packaged in 1-gallon polyethylene bottles; Fibre-Paks (the glass may be loose or contained in plastic bags inside the Fibre-Paks); or double contained in plastic bags with the outside of the bag taped for protection against sharp edges, or simply taped together before it is removed from the glovebox. All waste was double contained in plastic when it was removed from the glovebox, regardless of the initial packaging. Since approximately 1972, the waste was placed in a 55-gallon drum with a 90-mil liner that was lined with one or two drum bags. Prior to that the 90-mil liners were not used, but the 55-gallon drums were still lined with one or two drum bags. |
| ID 118E<br>ID 218E | The waste accumulated in drums may be dumped into an SWB. Each bag of waste is opened prior to placement in the SWB. The SWB has a fiberboard liner placed between the waste and the container liners for puncture protection. The SWB is lined with a 14-mil PVC liner. All bag liners are closed by taping along the folds.   |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

**ASSAY:** Each waste drum may be assayed on an SGS counter or a PAN drum counter. The results are expressed as grams of radionuclides per individual drum. For SWBs and bins, the individual drum assays are totaled to determine the amount of radionuclides present in each box. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

**FREE LIQUIDS:** (ID 118A/218A, ID 118E/218E) Liquids are prohibited by procedure from being placed in the waste package. The waste packaging procedure also instructs that absorbents (e.g., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the drum is closed. RTR examination of the sealed waste package is performed as a conclusive verification that no unacceptable free liquids are present. (ID 118B/218B, ID 118C/218C, ID 118D/218D) The waste was usually dry when packaged. If any moisture was detected, absorbent such as Oil-Dri, is added. Absence of free liquids was verified by RTR and/or the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1% volume) are permitted.

**EXPLOSIVES/COMPRESSED GASES:** Explosives are prohibited at RFETS. Pressurized containers are vented prior to placement in a waste package. No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and/or the INEEL Sampling Program for SWEPP-certified waste and during reprocessing of waste.

**PYROPHORICS:** No pyrophorics have been identified in this content code. Pyrophorics are prohibited by waste packaging procedures. Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste and during reprocessing of waste.

**CORROSIVES:** Packaging procedures require that all corrosive materials must be neutralized or removed from the glass waste prior to packaging. No corrosive materials have been identified by waste characterization. Absence of corrosive materials is verified by the INEEL Sampling Program for SWEPP-certified waste and during reprocessing of waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. Each bin is fitted with at least two filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: ID 119, ID 219 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Filter Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: (ID 119A, ID 119B/219B, ID 119C) Filter waste includes absolute dry box filters, HEPA filters, filter media (separated from the filter frame) and Ful-Flo (liquid) filters. (ID 219A, ID 219C) This waste consists of absolute filters used for filtering glovebox intake and exhaust air, HEPA filters, Chemical Warfare Service (CWS) filters, fiberglass and asbestos filter media, asbestos pipe insulation and asbestos gloves and fire blankets. The waste may contain limited amounts of combustible materials such as surgical gloves.

GENERATING SOURCES: (ID 119A, ID 119B/219B, ID 119C) The waste originated from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779 at RFETS. (ID 219A, ID 219C) This waste was generated at all plutonium areas at RFETS. The majority of the waste drums were generated by Plutonium Recovery Operations, Chemical Operations Support, and Analytical Laboratories.

WASTE FORM:

(ID 119A, ID 119B/219B, ID 119C) HEPA filters and drybox filters are of various sizes. The frames are made of wood or metal and the medium is a fiberglass-type or Nomex-type medium. Ful-Flo filter cartridges consist of polypropylene plastic. Some types of filter waste are processed by the addition of Portland cement to the waste, according to Waste Operations procedures.

(ID 219A, ID 219C) The majority of the absolute filters were 8 x 8 x 6 inches, but the waste also includes some 8 x 8 x 4-inch and 12 x 12 x 6-inch filters. The CWS filters includes 24 x 24 x 12-inch HEPA filters, 8 x 6-inch diameter CWS filters, 24 x 24 x 2-inch and 10 x 10 x 2-inch prefilters, and 8 x 8 x 6-inch and 8 x 8 x 4-inch absolute filters. Filter frames are wood, particle board or aluminum. The filter media is usually either fiberglass or asbestos. Other asbestos materials such as pipe insulation, gloves, and fire blankets are included.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code    | Description*   |
|---------|--|
| ID 119A | The filters or filter media are double bagged (two PVC bags or one each PVC and polyethylene bags) and removed from the glovebox line or filter plenum. In addition, the filter media may be collected within a polyethylene bottle (less than or equal to one gallon). The filter waste is then placed in a 55-gallon drum which is lined with an HDPE liner and a up to two 14-mil thick polyethylene round bottom liners. The drums have a fiberboard liner placed between the waste and the container liners as puncture protection. |

| Code               | Description*  |
|--------------------|---|
| ID 219A            | The absolute filters removed from a glovebox were double contained in plastic bags. The closed bags were placed in a 55-gallon drum lined with one or two drum bags. Starting in approximately 1972, the 55-gallon drums were lined with a 90-mil rigid polyethylene liner that was then lined with one or two drum bags. CWS filters were single or double bagged, sealed with tape, and placed in a drum prepared the same as absolute filters in drums. The majority of waste drums (insulation and CWS filter media) were filter media generated by splitting absolute and HEPA filters apart. The filter media and frames were disposed of separately. Filter media were either placed into a 1-gallon polyethylene bottle and double bagged out of the glovebox or placed directly into a polyethylene bag which was taped closed and then bagged out of the glovebox into one plastic bag. Each bag was taped closed and placed into a 55-gallon drum that was prepared the same as absolute filters in drums. Some drums contain insulation. Non-line generated waste, such as pipe insulation, was placed directly into prepared 55-gallon drums. If the contamination levels were high, the insulation may have been wrapped with tape. Line generated waste, such as asbestos gloves and fire blankets, fiberglass and asbestos prefilters and filter media, was double contained in plastic bags and then placed in prepared 55-gallon drums. |
| ID 119B<br>ID 219B | The filters or filter media are double bagged (two PVC bags or one each PVC and polyethylene bags) and removed from the glovebox line or filter plenum. In addition, the filter media may be collected within a polyethylene bottle (less than or equal to one gallon). The filter waste is then placed in an SWB. The SWB has a fiberboard liner placed between the waste and the container liners as puncture protection. The SWB is lined with a 14-mil PVC liner. All bag liners are sealed by taping along the folds.  |
| ID 119C<br>ID 219C | ID 119A/ID 219A packaging configuration (up to four 55-gallon containers) packaged directly into an SWB.  |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: The drums may be assayed on an SGS counter, a non-transmission corrected NaI drum counter, or a PAN drum counter. SWBs are assayed using a PAN crate counter. The results are expressed as grams of radionuclides per individual container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

FREE LIQUIDS: (ID 119A, ID 119B/219B, ID 119C) Filters and filter media are dried, drained or otherwise segregated from liquids and, in addition, absorbents (e.g., Oil-Dri) are added to the bottom of SWBs to absorb any liquids that may desorb after the box is closed. (ID 219A, ID 219C) The waste was usually dry when packaged. If any moisture was detected, absorbent such as Oil-Dri, is added. Absence of free liquids was verified by RTR and/or the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1% volume) are permitted.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited at RFETS. Pressurized containers are prohibited by packaging procedures. No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste.

PYROPHORICS: No pyrophorics have been identified in this content code. Pyrophorics are prohibited by waste packaging procedures. Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste.

CORROSIVES: All corrosive materials are neutralized or removed from this waste as required by waste packaging procedures. No corrosives have been identified by waste characterization. Absence of these materials is verified by the INEEL Sampling Program for SWEPP-certified waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: ID 121, ID 221 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Organic Solid Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: (ID 121A/221A, ID 121B/221B, ID 121C/221C) Rocky Flats Environmental Technology Site (RFETS) (ID 121CD/221CD) INEEL

WASTE DESCRIPTION: (ID 121A/221A, ID 121C/221C) Organic solid waste that is non-combustible. Benelex and Plexiglas neutron shielding, blacktop, concrete, dirt and sand are included in this content code. (ID 121B/221B) This waste consists of Benelex, which was used for neutron shielding, and Plexiglas glovebox windows. The Benelex was usually coated with fire-retardant paint and sometimes had lead sheeting attached to it. In addition to Plexiglas, some leaded glass may be present. (ID 121CD/221CD) The waste consists of retrievably stored, organic debris (e.g., combustibles, plastic, rubber, etc.) that is compacted. The treated waste product consists of compacted organic debris.

GENERATING SOURCES: (ID 121A/221A, ID 121C/221C) The waste originated from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779 at RFETS. (ID 121B/221B) The majority of the waste drums were generated from maintenance and renovation projects by Plutonium Recovery Operations. (ID 121CD/221CD) The waste material originates from the Advanced Mixed Waste Treatment Facility located at the RWMC at INEEL.

WASTE FORM:

(ID 121A/221A, ID 121C/221C) Benelex and Plexiglas neutron shielding in slabs that are two or four inches thick. This content code also encompasses blacktop, concrete, dirt and sand.

(ID 121B/221B) Benelex is a dense, laminated, lignocellulose hardboard made from wood chips and particles. The Benelex in this waste is usually two inches thick. The Benelex was used as neutron shielding and weighs approximately 90 lb/ft<sup>3</sup>. Plexiglas is a trade name for a transparent plastic material made from methyl methacrylate. Plexiglas glovebox windows are usually two to four inches thick and are various sizes.

(ID 121CD/221CD) All debris waste to be compacted is examined by radiography and, if necessary, sorted into 55-gallon transfer drums. During this radiography/sorting operation, prohibited materials are identified and segregated and organic debris is sorted/segregated from inorganic debris. Drums containing sorted/segregated organic debris are supercompacted into pucks.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| ID 121A<br>ID 221A | The waste is removed from the glovebox contained in up to two layers of plastic (two PVC bags or one each PVC and polyethylene). The bagged waste is then placed in a 55-gallon drum which is lined with an HDPE liner and up to two 14-mil polyethylene round bottom liners. The drums have a fiberboard liner placed between the waste and the container liners for puncture protection. |

| Code                 | Description*   |
|----------------------|--|
| ID 121B<br>ID 221B   | The majority of the drums contain Benelex gloveport doors, etc. Plexiglas and other types of glass may be found mixed in with the Benelex or segregated and contained in other waste drums with the same contents. Contaminated Benelex or Plexiglas was usually wrapped in plastic and placed in a 55-gallon drum lined with one or two drum bags. Starting in approximately 1972, the plexiglas was bagged-out in two bags prior to placement in 55-gallon drums which were lined with a 90-mil rigid polyethylene liner that was then lined with one or two drum bags.  |
| ID 121C<br>ID 221C   | The slabs may be wrapped with several layers of PVC sheeting and then placed in an SWB. The SWB is lined with a maximum of one 14-mil PVC liner. A fiberboard liner is placed between the waste and the box liner for puncture protection. All bag liners are closed by taping along the folds.  |
| ID 121CD<br>ID 221CD | Organic debris is contained in or placed into 55-gallon drums. These drums are then punctured to allow for gas release and supercompacted to reduce their volume and breach any and all plastic layers of confinement. Several compacted pucks are loaded into a specially designed, approximately 100-gallon drum (puck drum). The puck drum is the payload container, having the same height as a 55-gallon drum, but a larger diameter to accommodate compacted pucks. The puck drum has a dual lid (inner and outer) configuration for bagless transfer of the compacted pucks out of the glovebox containment where they were processed.<br><br>After the pucks are loaded, a filter vented inner lid is snapped into place, and the drum is taken away from the glovebox. Finally, the outer filter vented metal lid is placed on the puck drum and secured with a clamp ring. The packaging configuration does not contain any plastic layers of confinement. Filters placed on both the inner and outer lids have a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ moles/second/mole fraction. |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If 55-gallon drums overpacked in an SWB have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

**ASSAY:** (ID 121A/221A, ID 121B/221B, ID 121C/221C) The content code may be assayed on an SGS counter or a PAN drum counter. The results are expressed as grams of radionuclides per individual drum. The box is assayed by a PAN crate counter. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error). (ID 121CD/221CD) Each 55-gallon drum to be compacted is assayed, prior to compaction, using PAN counting, gamma energy analysis measurement techniques, and/or other approved assay method(s). These assay results remain valid after the drum is compacted into a puck. The total quantity and isotopic distribution of radioactive material contained in a puck drum is calculated by appropriately summing the assay results for each of the compacted pucks packaged into the payload container. These results are then used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

**FREE LIQUIDS:** (ID 121A/221A, ID 121C/221C) Liquids are prohibited by procedure from being placed in the waste package. RTR examination of the sealed package is performed as a second verification that no free liquids are present. (ID 121B/221B) The waste was usually dry when packaged. If any moisture was detected, absorbent such as Oil-Dri, is added. Absence of free liquids was verified by RTR and/or the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1% volume) are permitted. (ID 121CD/221CD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of unacceptable free liquid.

EXPLOSIVES/COMPRESSED GASES: (ID 121A/221A, ID 121B/221B, ID 121C/221C) Explosives are prohibited at RFETS. Pressurized containers are prohibited by packaging procedures. No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. (ID 121CD/221CD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of explosives and compressed gases.

PYROPHORICS: (ID 121A/221A, ID 121B/221B, ID 121C/221C) No pyrophorics have been identified in this content code. Pyrophorics are prohibited by waste packaging procedures. Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste. (ID 121CD/221CD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of pyrophoric material.

CORROSIVES: (ID 121A/221A, ID 121B/221B, ID 121C/221C) All corrosive materials are neutralized or removed from this waste as required by waste packaging procedures. No corrosives have been identified by waste characterization. Absence of these materials is verified by the INEEL Sampling Program for SWEPP-certified waste. (ID 121CD/221CD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of corrosive material.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each inner and outer drum lid is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: ID 122, ID 222 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Inorganic Solid Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: (ID 122A/222A, ID 122B/222B, ID 122C/222C, ID 122D/222D) Rocky Flats Environmental Technology Site (RFETS) (ID 122CD/222CD, ID 122IA/222IA) INEEL

WASTE DESCRIPTION: (ID 122A/222A, ID 122D/222D) The waste consists of firebrick, clay absorbent, and insulation. (ID 122B/222B) The firebrick waste consists of whole and broken pieces of construction bricks, cinderblocks, and incinerator firebrick. (ID 122C/222C) The Leco crucible waste consists of silicate-based ceramic crucibles and caps that were used for analyzing plutonium samples. The crucibles are 1-inch high by 1-inch diameter. (ID 122CD/222CD) The waste consists of retrievably stored, inorganic debris (e.g., metal, glass, graphite, firebrick, etc.) containing no more than 1 percent by weight organic debris/material (e.g., combustibles, plastic, rubber, etc.) that is compacted. The treated waste product consists of compacted inorganic debris. (ID 122IA/222IA) The waste consists of retrievably stored, homogeneous solids and soil/gravel waste that have been treated by incineration. The treated waste product consists of ash and is classified as newly generated waste.

GENERATING SOURCES: (ID 122A/222A, ID 122D/222D) The waste originated from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779 at RFETS. (ID 122B/222B) The firebrick waste was generated by Plutonium Recovery Operations and Size Reduction at RFETS. (ID 122C/222C) The Leco crucible waste was generated by the Plutonium Analytical Laboratories at RFETS. (ID 122CD/222CD, ID 122IA/222IA) The waste material originates from the Advanced Mixed Waste Treatment Facility located at the RWMC at INEEL.

WASTE FORM:

(ID 122A/222A, ID 122D/222D) The majority of the waste in this content code is waste generated during maintenance/stripout activities (i.e., replacement of firebrick refractory or insulation). The content code also encompasses insulation, fire blankets, and Oil-Dri (clay absorbent).

(ID 122B/222B) The firebrick waste from the Plutonium Recovery Incinerator is a high-alumina, high-strength, Class F brick manufactured by Plibrico (trade name: Plicast 40). The waste may also contain cinderblocks and construction brick.

(ID 122C/222C) The Leco crucible waste contains 1-inch high by 1-inch diameter silicate-based ceramic crucibles that were used for analyzing plutonium. Some Leco crucibles contain an accelerator (iron, tin, copper, titanium, stainless steel, etc.) used to calibrate the analyzer. The plutonium and accelerating metal are fused into the Leco crucible.

(ID 122CD/222CD) All debris waste to be compacted is examined by radiography and, if necessary, sorted into 55-gallon transfer drums. During this radiography/sorting operation, prohibited materials are identified and segregated and organic debris is sorted/segregated from inorganic debris. Drums containing sorted/segregated inorganic debris are supercompacted into pucks.

(ID 122IA/222IA) Retrievably stored organic homogeneous solids, inorganic homogeneous solids, and soil/gravel waste are incinerated to remove any organic material. The ash and residual incombustible matter are allowed to cool before being packaged into payload containers. The final waste form consists of an incinerator ash.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code                 | Description*   |
|----------------------|--|
| ID 122A<br>ID 222A   | The waste is removed from the glovebox contained in up to two layers of plastic (two PVC bags or one each PVC and polyethylene). The bagged waste is then placed in a 55-gallon drum which is lined with an HDPE liner and up to two 14-mil polyethylene round bottom liners. The drums have a fiberboard liner placed between the waste and the container liners for puncture protection.   |
| ID 122B<br>ID 222B   | The firebrick waste was packaged by a variety of methods. It was placed directly into a prepared 55-gallon drum, it was double contained in plastic before placement in the prepared 55-gallon drum, or it was double contained in plastic and then placed into a Fibre-Pak before placement into a prepared 55-gallon drum. The 55-gallon drums were lined with one or two plastic drum bags. Cardboard liners were sometimes used to line the inner drum bags. Since 1972, the drums were lined with 90-mil rigid polyethylene liners and lined with one or two plastic drum bags. Some drums contained as many as three or four inner bags and one or two drum liner bags, but never exceeded five total layers of plastic.   |
| ID 122C<br>ID 222C   | The Leco crucibles were placed in a 1-gallon metal paint can, the lid placed on and sealed with tape, and the paint can was double bagged out of the glovebox. The paint cans were then placed in a 55-gallon drum lined with two plastic drum bags. Since 1972, a 90-mil rigid liner was used inside each 55-gallon drum and the two plastic drum bags were placed inside the rigid plastic liner.  |
| ID 122CD<br>ID 222CD | <p>Inorganic debris is contained in or placed into 55-gallon drums. These drums are then punctured to allow for gas release and supercompacted to reduce their volume and breach any and all plastic layers of confinement. Several compacted pucks are loaded into a specially designed, approximately 100-gallon drum (puck drum). The puck drum is the payload container, having the same height as a 55-gallon drum, but a larger diameter to accommodate compacted pucks. The puck drum has a dual lid (inner and outer) configuration for bagless transfer of the compacted pucks out of the glovebox containment where they were processed.</p> <p>After the pucks are loaded, a filter vented inner lid is snapped into place, and the drum is taken away from the glovebox. Finally, the outer filter vented metal lid is placed on the puck drum and secured with a clamp ring. The packaging configuration does not contain any plastic layers of confinement. Filters placed on both the inner and outer lids have a hydrogen diffusivity greater than or equal to <math>3.7 \times 10^{-6}</math> moles/second/mole fraction.</p> |
| ID 122D<br>ID 222D   | The SWB is lined with a 14-mil PVC liner. Waste is directly loaded into the SWB and contains no inner bags. The SWBs have a fiberboard liner placed between the waste and the container liners for puncture protection. All standard SWB liner bags are closed by taping along the folds.  |

| Code                 | Description*  |
|----------------------|---|
| ID 122IA<br>ID 222IA | <p>The cooled ash and incombustible matter is placed into a specially designed 55-gallon drum for a payload container. The drum has a dual lid (inner and outer) configuration for bagless transfer of the waste mixture out of the glovebox containment where it is processed. After the drum is filled, a filter vented inner lid is snapped into place, and the drum is taken away from the glovebox. Finally, the 55-gallon drum is closed with a conventional filter vented lid held in place by a clamp ring. The packaging configuration does not include any plastic layers of confinement or a rigid liner. Filters placed on both the inner and outer lids have a hydrogen diffusivity greater than or equal to <math>3.7 \times 10^{-6}</math> moles/second/mole fraction.</p> <p>Ash product drums may be overpacked into an SWB or a TDOP if any nonconformance in packaging cannot be corrected. No sealed liner bags will be used with drums overpacked in an SWB or a TDOP.</p> |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If 55-gallon drums overpacked in an SWB have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: (ID 122A/222A, ID 122B/222B, ID 122C/222C, ID 122D/222D) The waste drums may be assayed on an SGS counter or a PAN drum counter. For SWBs, the drum assays are totaled to determine the amount of radionuclides in each box. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error). (ID 122CD/222CD) Each 55-gallon drum to be compacted is assayed, prior to compaction, using PAN counting, gamma energy analysis measurement techniques, and/or other approved assay method(s). These assay results remain valid after the drum is compacted into a puck. The total quantity and isotopic distribution of radioactive material contained in a puck drum is calculated by appropriately summing the assay results for each of the compacted pucks packaged into the payload container. These results are then used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error). (ID 122IA/222IA) Loose ash for a single product drum is metered into an assay chamber from a large ash mixing hopper. This metered batch of ash is radioassayed using gamma spectrometry or similar approved assay technique. When the measurement is complete, the ash is discharged from the assay chamber into a product drum. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: (ID 122A/222A, ID 122D/222D) Liquids are prohibited by procedure from being placed in the waste package. RTR examination of the sealed waste package is performed as a conclusive verification that no unacceptable free liquids are present. (ID 122B/222B, ID 122C/222C) Waste was usually dry when packaged. If any moisture was detected, absorbent such as Oil-Dri, Portland cement, vermiculite or clay was added. Absence of free liquids is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1 volume %) are permitted. If the waste contains high density material, such as lead, that is opaque to the RTR system, that waste package will not be certified because residual liquids may escape detection. (ID 122CD/222CD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of unacceptable free liquid. (ID 122IA/222IA) The high temperature of the thermal process (i.e., incineration) used in the treatment of the incoming waste material ensures that the final waste product contains no free liquids.

EXPLOSIVES/COMPRESSED GASES: (ID 122A/222A, ID 122B/222B, ID 122C/222C, ID 122D/222D) Explosives are prohibited at RFETS. Pressurized containers are prohibited by packaging procedures. No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. (ID 122CD/222CD) Radiography or visual examination and sorting/segregating of waste contents prior to

compacting is performed to ensure and verify the absence of explosives and compressed gases. (ID 122IA/222IA) The high temperature of the thermal process (i.e., incineration) used in the treatment of the incoming waste material ensures that the final waste product contains no explosives and/or compressed gases.

PYROPHORICS: (ID 122A/222A, ID 122B/222B, ID 122C/222C, ID 122D/222D) No pyrophorics have been identified in this content code. Pyrophorics are prohibited by waste packaging procedures. Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste. (ID 122CD/222CD) Radiography or visual examination and sorting/segregating of the waste contents prior to compacting is performed to ensure and verify the absence of pyrophoric material. (ID 122IA/222IA) The high temperature of the thermal, oxidative process (i.e., incineration) used in the treatment of the incoming waste material ensures that the final waste product contains no pyrophoric material.

CORROSIVES: (ID 122A/222A, ID 122B/222B, ID 122C/222C, ID 122D/222D) Corrosives are prohibited by waste packaging procedures. No corrosives have been identified by waste characterization. Absence of these materials is verified by the INEEL Sampling Program for SWEPP-certified waste. (ID 122CD/222CD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of corrosive material. (ID 122IA/222IA) The high temperature of the thermal, oxidative process (i.e., incineration) used in the treatment of the incoming waste material ensures that the final waste product contains no corrosive material.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each inner and outer drum lid is fitted with a minimum of one filter, and the rigid liner (if present) will be fitted with a filter or punctured. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine and up to ten filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: ID 123, ID 223 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Leaded Rubber

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: (ID 123) The waste consists of leaded gloves and aprons. (ID 223) Leaded rubber waste consisting of glovebox gloves and aprons generated by all plutonium areas. Limited amount of unleaded gloves, lead bricks, and lead sheeting may be included.

GENERATING SOURCES: (ID 123) The waste originated from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779 at RFETS. (ID 223) Leaded materials are generated by all plutonium areas. From 1971 to 1973, the waste was packaged by each generating area. Since 1974, the Size Reduction Facility (Building 776) has processed all leaded items.

WASTE FORM: Discarded leaded gloves and aprons are comprised of layers of Hypalon rubber and lead oxide impregnated neoprene. Leaded rubber that has been exposed to nitric acid is washed to remove any lead nitrate that may have formed.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code    | Description*  |
|---------|---|
| ID 123A | The waste is removed from the glovebox line wrapped in two bags (two PVC bags or one PVC and one polyethylene bag) and placed in a 55-gallon drum which is lined with an HDPE liner and up to two 14-mil polyethylene round bottom liners.  |
| ID 223A | <p>Glovebox gloves, aprons, and other leaded items from areas other than the Size Reduction Facility were double contained in plastic bags, and each bag was closed with tape. The bagged waste was then placed into prepared waste drums. Leaded items processed by size reduction were placed directly into prepared waste drums after processing.</p> <p><u>Drum Preparation</u>:</p> <p><u>1970-1972</u>: Each 55-gallon drum was lined with up to two plastic bags. After filling with waste packages, each plastic drum bag was closed by the twist and tape method.</p> <p><u>1972-Present</u>: Each 55-gallon drum was lined with a 90-mil rigid polyethylene drum liner. The drum liner was lined with up to two plastic drum bags. After filling with waste, each drum bag was closed by the twist and tape method. The rigid liner lid and drum lid were then installed.</p> |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: The drums may be assayed on an SGS counter or a PAN counter. The results are expressed as grams of radionuclides per individual drum. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

FREE LIQUIDS: (ID 123) Leaded rubber is dried, drained or otherwise segregated from free liquids as required by waste packaging procedures. In addition, sufficient absorbent is added directly to the waste to immobilize any liquid that may be present. RTR examination of the sealed drum is performed as a conclusive verification that no unacceptable free liquids are present. (ID 223) The waste was dry when packaged. Absence of residual liquids (<1% volume) is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited at RFETS. Pressurized containers are prohibited by packaging procedures. No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste.

PYROPHORICS: The washing of the leaded rubber that was exposed to nitric acid removes any lead nitrate that may have formed. No other pyrophorics have been identified. Pyrophorics are prohibited by waste packaging procedures. Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste.

CORROSIVES: All corrosive materials are neutralized or removed from this waste as required by waste packaging procedures. No corrosives have been identified by waste characterization. Absence of these materials is verified by the INEEL Sampling Program for SWEPP-certified waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: ID 124, ID 224 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Pyrochemical Salt Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: (ID 124) The waste consists of spent chloride salt from molten salt extraction, electrorefining or direct oxide reduction. (ID 224) This waste consists of fused halide salt mixtures that were used for pyrochemical and electrochemical separation and purification processes. The salt was generated from cleanup of spent salts.

GENERATING SOURCES: (ID 124) The waste originated from Buildings 371, 776, and 779 at RFETS. (ID 224) Each of these wastes originated at the RFETS. The waste was generated by the Process Chemistry and Development Group in Building 776.

WASTE FORM: The salt is composed of various combinations of cesium, calcium, magnesium, potassium and sodium chloride salts from pyrochemical operations. Some of the salts may contain calcium fluoride or calcium oxide.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code    | Description*  |
|---------|---|
| ID 124A | The salt is placed in a produce can, then bagged and placed in a larger can. The larger can is then double-bagged (two PVC bags or one PVC and one polyethylene bag) and removed from the glovebox line. The waste is placed in a 55-gallon drum which is lined with an HDPE liner and up to two 14-mil polyethylene round bottom liners. A fiberboard liner is placed between the waste and the drum liners for puncture protection.   |
| ID 224A | The molten salt waste was packaged in produce cans (approximately one-quart) with the lids rolled-seam sealed to the can. Each can was bagged out of the glovebox in double plastic bags and placed in a 55-gallon drum that contains a 90-mil liner and one or two drum bags. Electrorefining and Gibson salt wastes were packaged the same as molten salts except that after the can was bagged out of the glovebox in a double-bag, it was placed in a stainless steel can before placement into the drum with the 90-mil liner and two drum bags. |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: (ID 124) The individual cans of salt are assayed in-line using an SGS counter. The can assays are totaled to determine the amount of radionuclides present in a drum. (ID 224) Each waste drum is assayed by PAN assay. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

FREE LIQUIDS: (ID 124) The salts are packaged in a dry environment. RTR examination verifies that no free liquid is present in the waste package. (ID 224) The waste was dry when packaged. Absence of free

liquids is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1% volume) are permitted.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited at RFETS. Pressurized containers are prohibited by waste packaging procedure. The absence of pressurized containers is verified by periodic waste certification inspection of the waste packaging. No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste.

PYROPHORICS: (ID 124) No pyrophorics have been identified in this waste. Direct oxide-reduction salt will be air sparged to oxidize any free calcium metal prior to packaging. Pyrophorics are prohibited by waste packaging procedures. (ID 224) Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste.

CORROSIVES: No corrosives have been identified in this waste. Corrosives are neutralized or removed from transuranic waste prior to packaging as required by waste packaging procedures. No corrosive materials have been identified by waste characterization. Absence of corrosive materials is verified by the INEEL Sampling Program for SWEPP-certified waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: ID 125, ID 225 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: INEEL Stored TRU Combustible and Noncombustible Waste

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: (ID 125A/225A) This waste consists of a variety of different waste forms such as dissolved laboratory samples absorbed in Oil-Dri, uranium pellets, plutonium sources, glassware, gloves, Kimwipes and used equipment. (ID 125B/225B) This waste consists of leached and unleached glass neutron absorbers (Raschig rings). (ID 125C/225C) This waste consists of a variety of noncompressible and noncombustible items such as filters, metal equipment, hand tools, furnace brick, metal crucibles, and funnels, etc. (ID 125D/225D) This waste consists of a variety of waste glass from laboratory glassware to glass equipment and combustible items such as cellulose, plastics, and rubber. (ID 125E/225E) This waste consists of noncombustible whole and broken pieces of construction bricks, cinderblocks, and incinerator firebrick and combustible waste.

GENERATING SOURCES: (ID 125A/225A) This waste originated from the americium processing glovebox by Plutonium Recovery Operations at RFETS. (ID 125B/225B) The glass waste was generated by all of the plutonium processing areas. (ID 125C/225C) The waste was generated from all of the RFETS plutonium areas. (ID 125D/225D) The glass waste was generated by all of the plutonium processing areas. (ID 125E/225E) This firebrick waste was generated by Plutonium Recovery Operations and Size Reduction at RFETS.

WASTE FORM:

(ID 125A/225A) This waste consists of piping, flanges, valves, tools, glassware, filters, polyethylene bottles, glovebox gloves, paper, and plastics.

(ID 125B/225B) This waste is in the form of glass Raschig rings, which are borated glass rings approximately 1.75 inches high by 1.50 inches in diameter with a wall thickness of approximately 0.25 inch.

(ID 125C/225C) The waste consists of non-line and line-generated metal wastes in the form of gloveboxes, glovebox windows, furnaces, piping, angle iron, tanks, respirator filters, ultrasonic cleaners, control panels, electronic instrumentation, vacuum sweepers, pumps, motors, trays, hotplates, empty cans, power tools, hand tools, etc.

(ID 125D/225D) The waste is in the form of glass sample vials, bottles, equipment, such as ion exchange columns and dissolver pots, laboratory glassware, such as flasks and beakers, and glovebox windows. Containers also contain miscellaneous combustible debris, such as cellulose, plastics, and rubber.

(ID 125E/225E) The firebrick waste from the Plutonium Recovery Incinerator is a high-alumina, high-strength, Class F brick manufactured by Plibrico (trade name: Plicast 40). The waste may also contain cinderblocks and construction brick. The waste also contains miscellaneous combustible debris, such as cellulose, plastic, and rubber.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

WASTE PACKAGING DESCRIPTION TABLE

| Code               | Description*   |
|--------------------|--|
| ID 125A<br>ID 225A | The waste was bagged out of the glovebox in one or two plastic bags. Most of the waste was then placed in a 13-inch high by 15.5-inch diameter Fibre-Pak. The Fibre-Paks were then placed in a prepared waste drum. In approximately 1972, use of the 90-mil rigid drum liner began. The rigid drum liner was lined with one or two plastic drum bags. Prior to use of the rigid drum liner, the drum was lined with two plastic drum bags. Lead shielding and lead taping may have been used to reduce radiation exposure levels.   |
| ID 125B<br>ID 225B | <p>The unleached borated glass Raschig rings were removed from liquid storage tanks that had been flushed and drained of all liquid.</p> <p>Leached Raschig rings consist of Raschig rings that were contaminated with plutonium. The rings were leached in nitric acid to remove the contamination and repackaged.</p> <p>Contaminated Raschig rings were removed from a liquid storage tank and leached. The rings were allowed to air dry before repackaging. The leached Raschig rings were contained in up to three plastic bags and placed in a Fibre-Pak. The Fibre-Pak was then placed in a 55-gallon drum with a 90-mil rigid liner (depending on the packaging date) and one or two drum bags.</p>   |
| ID 125C<br>ID 225C | The waste is usually triple-contained in plastic before being placed in a prepared 55-gallon drum. Any sharp metal edges are usually taped before packaging. Non line-generated wastes are usually placed directly into the prepared 55-gallon drum. The 55-gallon drums are lined with one or two plastic drum bags. Since approximately 1972, the drums are lined with a 90-mil rigid polyethylene liner that was lined with the two plastic drum bags. There may be a number of combinations of drum bags, poly bags, and o-ring bags.  |
| ID 125D<br>ID 225D | The glass was packaged in several different ways. Whole or broken glass may have been packaged in 1-gallon polyethylene bottles, Fibre-Paks (the glass may be loose or contained in plastic bags inside the Fibre-Paks), or double-contained in plastic bags with the outside of the bag taped for protection against sharp edges, or simply taped together before it is removed from the glovebox. All waste was double-contained in plastic when it was removed from the glovebox, regardless of the initial packaging. Since approximately 1972, the waste was placed in a 55-gallon drum with a 90-mil liner with one or two drum bags inside the liner. Prior to that, the 90-mil liners were not used, but the 55-gallon drums were still lined with one or two drum bags. |
| ID 125E<br>ID 225E | The firebrick waste was packaged by a variety of methods. It was placed directly into a prepared 55-gallon drum, it was double-contained in plastic before placement in the prepared 55-gallon drum, or it was double-contained in plastic and then placed into a Fibre-Pak before placement into a prepared 55-gallon drum. The 55-gallon drums were lined with one or two plastic drum bags. Cardboard liners were sometimes used to line the inner drum bags. Since 1972, the drums were lined with a 90-mil rigid polyethylene liner with one or two plastic drum bags inside the liner. Some drums contained as many as three or four inner bags and one or two drum liner bags, but never exceeded five total layers of plastic.   |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If drums have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: The drums may be assayed on an SGS counter or a PAN counter. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error).

FREE LIQUIDS: The waste was usually dry when packaged. If any moisture was detected, absorbent such as Oil-Dri, is added. Absence of free liquids was verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1 volume %) are permitted.

EXPLOSIVES/COMPRESSED GASES: No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. (ID 125) Absence of explosives/compressed gases is verified during reprocessing of waste.

PYROPHORICS: Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste. (ID 125) Absence of pyrophoric materials is also verified during reprocessing of waste.

CORROSIVES: No corrosive materials have been identified by waste characterization. Absence of corrosive materials is verified by the INEEL Sampling Program for SWEPP-certified waste. (ID 125) Absence of corrosive materials is also verified during reprocessing of waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: ID 126, ID 226 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Cemented Organic Process Solids

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: (ID 126A/226A, ID 126B/226B) Rocky Flats Environmental Technology Site (RFETS)  
(ID 126MCD/226MCD) INEEL

WASTE DESCRIPTION: (ID 126A/226A) This waste consists of washed, spent anion and cation exchange resins that were coated with cement with a mixer in a metal bowl. The resin was slurried with Portland cement and water, poured into a polyethylene residue container mold, and allowed to solidify. All particulate and sludge-type wastes generated and containerized during plutonium recovery operations are solidified with Portland cement. The resultant waste is designated cemented or solidified process solids. Examples of the waste are grit, firebrick fines, filter sludge, and resins. (ID 126B/226B) The leached and cemented resins consist of anion and cation exchange resins that have been used in the purification and recovery of plutonium and americium. The washed resin was mixed with Portland cement and water to form a solid mass. (ID 126MCD/226MCD) The waste consists of retrievably stored, organic debris (e.g., combustibles, plastic, rubber, etc.) that is first compacted and then may be macroencapsulated in grout.

GENERATING SOURCES: (ID 126A/226A) The waste originated from Buildings 371 and 771 at RFETS. (ID 126B/226B) The majority of the resins were generated by Plutonium Recovery Operations at RFETS. Some of the resins were generated by research and development groups and analytical laboratories. (ID 126MCD/226MCD) The waste material originates from the Advanced Mixed Waste Treatment Facility located at the RWMC.

WASTE FORM:

(ID 126A/226A) The waste is mixed with a Portland cement mixture in a one-gallon mold. The cement mixture used varies by procedure with the type of waste being cemented. The "pucks" are allowed to cure and are then placed in a 55-gallon drum.

(ID 126B/226B) The cemented resins are a polystyrene and divinylbenzene copolymer. The anion resins are DOWEX 1x4, DOWEX 11, and Rohm and Haas Amberlite IRA-938. The cation resin is DOWEX 50x8. All resins are in the 20 to 100-mesh range. The resins were leached with hot 0.35 N nitric acid to remove radioactive material, washed with water twice to remove nitric acid, vacuum-dried, cemented, and packaged.

(ID 126MCD/226MCD) All debris waste to be compacted is examined by radiography and, if necessary, sorted into 55-gallon transfer drums. During this radiography/sorting operation, prohibited materials are identified and segregated and organic debris is sorted/segregated from inorganic debris. Drums containing organic debris are supercompacted into pucks. Pucks are then placed into puck drums (i.e., approximately 100-gallon drums) that are equipped with internal spacers at the bottom and sides to stabilize pucks as they are loaded. Finally, grout may be poured around the compacted pucks inside the puck drums.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code                   | Description*  |
|------------------------|---|
| ID 126A<br>ID 226A     | The solidified pucks or polyethylene containers are double-bagged with plastic (two layers of PVC or one each of PVC and polyethylene) and are then placed in a 55-gallon drum which is lined with an HDPE liner and one or two 14-mil polyethylene bags.   |
| ID 126B<br>ID 226B     | The resin waste was cemented by mixing 1 liter of Portland cement, 0.5 liters of water, and 1 liter of washed resin into a slurry. The slurry was poured into a 1-gallon polyethylene bottle containing approximately 0.5 inch of dry Portland cement and allowed to cure. Another 0.5-inch layer of dry Portland cement was placed on top of the hardened resin/cement mixture before the bottle was capped. Each bottle was double bagged out of the glovebox and placed into a 55-gallon drum that was lined with a 90-mil rigid polyethylene liner and one or two plastic drum bags.  |
| ID 126MCD<br>ID 226MCD | <p>Organic debris is contained in or placed into 55-gallon drums. These drums are then punctured to allow for gas release and supercompacted to reduce their volume and breach any and all plastic layers of confinement. Several compacted pucks are loaded into a specially designed, approximately 100-gallon drum (puck drum). The puck drum is the payload container, having the same height as a 55-gallon drum, but a larger diameter to accommodate compacted pucks and optional encapsulating grout. The puck drum has a dual lid (inner and outer) configuration for bagless transfer of the compacted pucks out of the glovebox containment where they were processed.</p> <p>After the pucks are loaded, a filter vented inner lid is snapped into place, and the outer filter vented metal lid is placed on the puck drum and secured with a clamp ring. The packaging configuration does not contain any plastic layers of confinement. Filters placed on both the inner and outer lids have a hydrogen diffusivity greater than or equal to <math>3.7 \times 10^{-6}</math> moles/second/mole fraction.</p> <p>Prior to installation of the inner lid, a fluid mixture of cement grout may be poured around the stack of pucks for the purposes of macroencapsulation. The grout formulation and/or application will allow for hydrogen gas release through or around the grout to prevent accumulation of hydrogen inside the macroencapsulated waste. After the grout has set, the outer lid is installed.</p> |

\* 1. If drums are overpacked in SWBs, or in 85-gallon drums (overpacked in TDOPs), no closed liner bags are used in the SWB or in the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC. 2. If 55-gallon drums overpacked in an SWB have a 2-inch diameter hole in the drum lid and rigid liner for direct gas communication, the SWB is considered to be a direct loaded SWB. No liner bags will be used in the SWB.

ASSAY: (ID 126A/226A) Prior to cementation, each bottle of particulates or sludges is assayed with an SGS counter. The assays of the individual containers are totaled to determine the amount of radionuclides in each drum. The results are displayed in grams of radionuclides per drum. (ID 126B/226B) Each waste drum is assayed by PAN assay. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and total decay heat (plus error). (ID 126MCD/226MCD) Each 55-gallon drum to be compacted is assayed, prior to compaction, using PAN counting, gamma energy analysis measurement techniques, and/or other approved assay method(s). These assay results remain valid after the drum is compacted into a puck. The total quantity and isotopic distribution of radioactive material contained in a puck drum is calculated by appropriately summing the assay results for each of the compacted pucks packaged into the payload container. These results are then used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: (ID 126A/226A) The cemented waste is inspected prior to packaging to ensure that no free liquids are present. The absence of free liquids is verified by RTR examination. (ID 126B/226B) Waste may have been damp when packaged. Portland cement was added to absorb any free liquid. Absence of free liquids is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1% volume) are permitted. (ID 126MCD/226MCD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of unacceptable free liquid in the waste material prior to compaction. The macroencapsulation process is tightly controlled to preclude the presence or formation of free liquid after macroencapsulation. Radiography is performed on a statistical sample of macroencapsulated drums produced to verify the absence of unacceptable free liquid.

EXPLOSIVES/COMPRESSED GASES: (ID 126A/226A, ID 126B/226B) Explosives are prohibited at RFETS. Explosives and compressed gases are prohibited by waste packaging procedures. The RTR examination ensures no pressurized containers are present. No explosives or compressed gases have been identified by waste characterization. Absence of these materials is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. (ID 126MCD/226MCD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of explosives and compressed gases.

PYROPHORICS: (ID 126A/226A, ID 126B/226B) Pyrophorics would be rendered innocuous by the solidified cement matrix. Also, pyrophorics are prohibited by waste packaging procedures. Nonradioactive pyrophoric materials have not been identified by characterization of the waste streams. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste. (ID 126MCD/226MCD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of pyrophoric material.

CORROSIVES: (ID 126A/226A, ID 126B/226B) No corrosive materials have been identified in this waste. Corrosive materials are also prohibited by waste packaging procedures. No corrosive materials have been identified by waste characterization. Absence of corrosive materials is verified by the INEEL Sampling Program for SWEPP-certified waste. (ID 126MCD/226MCD) Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of corrosive material.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each inner and outer drum lid is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. At SWEPP, each waste drum is weighed and evaluated by RTR to determine compliance with WIPP WAC. Container integrity is determined by visual examination and ultrasonic measurements. Compliance with all criteria is verified by SWEPP quality control inspection and statistical sampling of waste certified for WIPP.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: ID 127, ID 227 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Combined Solid Organics, Solid Inorganics, and Solidified Inorganics

STORAGE SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: This content code has been created specifically for use in the WIPP Experimental Program. The waste consists of paper, rags, cloth, coveralls, plastic, rubber, wood and other similar items. The waste also consists of discarded graphite from plutonium casting and laboratory operations, and non-pyrophoric waste metals (i.e., iron, copper, aluminum, beryllium chips, stainless steel, tungsten, lead and tantalum); glass and ceramic waste from recovery, maintenance, and laboratory operations; firebrick, clay absorbent, and insulation; and spent chloride salt from molten salt extraction, electrorefining, or direct oxide reduction. The aqueous effluent from uranium and plutonium processing activities is mixed with approximately 30% Portland cement. Naturally occurring salt, clay (bentonite) and wire screen (steel) have been added to the payload containers for experimental purposes.

GENERATING SOURCES: The waste originates from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779 at RFETS.

WASTE FORM: The solid organic waste consists of combustibles such as cloth and paper products from cleanup of gloveboxes and spills; wood in the form of lumber; cardboard; plywood sheeting; surgeons' gloves; plastics such as polyethylene, PVC, and Teflon; filter wastes such as absolute dry box filters and HEPA filters; Plexiglas and Benelex; leaded rubber such as discarded leaded gloves and aprons; and cemented process solids such as grit, filter sludge, and resins.

The solid inorganic waste consists of graphite waste in the form of molds, chunks, pieces, furnace equipment, and discarded laboratory equipment; metal waste in the form of gloveboxes, used shielding, tools, crucibles, and machinery; glass waste such as Raschig rings, ceramic crucibles, glovebox windows, laboratory glassware, and process equipment and empty containers; waste generated during maintenance/stripout activities including firebrick, clay absorbent, insulation, fire blankets, and Oil-Dri; and pyrochemical salt waste composed of various combinations of cesium, calcium, magnesium, potassium, and sodium chloride salts from pyrochemical operations.

The solidified inorganic waste is produced by vacuum filtration of precipitated solids from an aqueous waste slurry. The filter medium is an inert diatomaceous earth medium that accumulates on a rotating drum. Solids are trapped on the surface of the filter medium as the solution passes through. The surface of the filter medium with entrapped solids is skimmed off as wet sludge. The precipitated solids are chiefly hydroxides with a pH of 10-12. The particulate and sludge-type wastes are mixed with a Portland cement mixture in a one-gallon mold. The cement mixture used varies by procedure with the type of waste being cemented.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

WASTE PACKAGING DESCRIPTION TABLE

| Code               | Description*  |
|--------------------|---|
| ID 127A<br>ID 227A | All plastic bags will be punctured prior to placement in a bin which has been specifically outfitted with test apparatus. The bin will contain a maximum of two layers of liner bags equivalent in size to the liner bags used in an SWB. The bin will be overpacked in an SWB. |

\* All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: The content code may be assayed on an SGS counter, a PAN counter or a non-transmission corrected NaI drum counter. The sludge waste is analyzed using a PAN counter or radiochemical assay. Each major type of waste (i.e., solid organics, solid inorganics, and solidified inorganics) will be assayed in drums separately prior to being mixed. The results of the analysis are expressed in terms of grams of radionuclides per individual drum or grams of radionuclides present for each gram of sludge. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error). The assays of the individual containers are totaled to determine the amount of radionuclides in each bin.

FREE LIQUIDS: Liquids are prohibited by procedure from being placed in the waste package. The waste packaging procedure also requires that absorbents (e.g., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the waste package is closed. Absence of free liquids is verified by RTR and the INEEL Sampling Program for SWEPP-certified waste. Minor residual liquids (<1% volume) are permitted. Verification to meet free liquids criteria is performed prior to mixing of waste in an experimental bin. If any residual liquids are detected during repackaging, an absorbent such as Oil-Dri, Portland cement, vermiculite or clay is added.

EXPLOSIVES/COMPRESSED GASES: Pressurized containers are vented prior to placement in a waste package. RTR examination of all waste packages provides verification that the containers are vented. No explosives, explosive mixtures or compressed gases have been identified in this waste. Absence of these materials is verified by RTR, the INEEL Sampling Program for SWEPP-certified waste, and during reprocessing of the waste. Verification is performed prior to mixing of waste in an experimental bin.

PYROPHORICS: No pyrophoric materials have been identified in this content code. Pyrophorics are prohibited by waste packaging procedures. Absence of pyrophoric materials is verified by the INEEL Sampling Program for SWEPP-certified waste and during reprocessing of the waste.

CORROSIVES: Packaging procedures require that all corrosive materials must be neutralized or removed from the metal waste prior to packaging. No corrosive materials have been identified in this waste. Absence of corrosive materials is verified by the INEEL Sampling Program for SWEPP-certified waste and during reprocessing of the waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, the bin lid contains at least two filters and the SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: ID 130, ID 230 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solid Inorganic with Residual Organic Waste

GENERATING SITE: Idaho National Engineering and Environmental Laboratory (INEEL)

WASTE DESCRIPTION: The waste consists of retrievably stored, inorganic debris (e.g., metal glass, graphite, firebrick, etc.) containing no more than 10 percent by weight organic debris/material (e.g., combustibles, plastic, rubber, etc.) that is compacted. The treated waste product consists of compacted inorganic with residual organic debris.

GENERATING SOURCES: The waste material originates from the Advanced Mixed Waste Treatment Facility located at the RWMC at INEEL.

WASTE FORM: All debris waste to be compacted is examined by radiography and, if necessary, sorted into 55-gallon transfer drums. During this radiography/sorting operation, prohibited materials are identified and segregated and organic debris is sorted/segregated from inorganic debris. Drums containing inorganic with residual organic debris are supercompacted into pucks.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code                 | Description  |
|----------------------|--|
| ID 130CD<br>ID 230CD | <p>Inorganic with residual organic debris is contained in or placed into 55-gallon drums. These drums are then punctured to allow for gas release and supercompacted to reduce their volume and breach any and all plastic layers of confinement. Several compacted pucks are loaded into a specially designed, approximately 100-gallon drum (puck drum). The puck drum accommodates compacted pucks, and has a dual lid (inner and outer) configuration for bagless transfer of the compacted pucks out of the glovebox containment where they were processed.</p> <p>After the pucks are loaded, a filter vented inner lid is snapped into place, and the drum is taken away from the glovebox. Finally, the outer filter vented metal lid is placed on the puck drum and secured with a clamp ring. The packaging configuration does not contain any plastic layers of confinement. Filters placed on both the inner and outer lids have a hydrogen diffusivity greater than or equal to <math>3.7 \times 10^{-6}</math> moles/second/mole fraction.</p> |

ASSAY: Each 55-gallon drum to be compacted is assayed, prior to compaction, using PAN counting, gamma energy analysis measurement techniques, and/or other approved assay method(s). These assay results remain valid after the drum is compacted into a puck. The total quantity and isotopic distribution of radioactive material contained in a puck drum is calculated by appropriately summing the assay results for each of the compacted pucks packaged into the payload container. These results are then used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of unacceptable free liquid.

EXPLOSIVES/COMPRESSED GASES: Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of explosives and compressed gases.

PYROPHORICS: Radiography or visual examination and sorting/segregating of the waste contents prior to compacting is performed to ensure and verify the absence of pyrophoric material.

CORROSIVES: Radiography or visual examination and sorting/segregating of waste contents prior to compacting is performed to ensure and verify the absence of corrosive material.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types III.2 and III.3 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each inner and outer drum lid is fitted with a minimum of one filter. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LA 111, LA 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Solidified Aqueous or Homogeneous Inorganic Solids

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: Cemented or dewatered sludge from precipitation/flocculation of aqueous waste from the Technical Area 50 (TA-50) Waste Water Treatment Facility (RLWTF).

GENERATING SOURCES: The waste originates from TA-50 Waste Water Treatment Plant.

WASTE FORM: The majority of the waste is vacuum filter cake sludge produced at the RLWTF by vacuum filtration of precipitated solids from an aqueous waste slurry. The filter agent is an inert diatomaceous earth or perlite medium that accumulates on a rotation drum. Solids are trapped on the surfaces of the filter medium as the solution passes through. The surface of the filter medium with entrapped filtrate is skimmed off as wet sludge. The precipitated solids are chiefly iron hydroxide. The waste form may contain trace (<1% weight) organics. Additional wastes are produced from cementation of sludge produced in a pretreatment processing room (Room 60) of the RLWTF.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| LA 111A<br>LA 211A | The waste is placed into a 55-gallon drum which is lined with a 90-mil thick HDPE liner (lid has a one-inch diameter hole or has been punctured with a minimum 0.3-inch hole) and a 5-mil plastic liner bag. The 5-mil plastic liner bag is twisted and taped closed in a horse-tail shape.  |
| LA 111B<br>LA 211B | The waste is placed into a 55-gallon drum which is lined with a 90-mil thick HDPE liner (lid has a one-inch diameter hole or has been punctured with a minimum 0.3-inch hole) and a 5-mil plastic liner bag. The 5-mil plastic bag is not sealed with tape but is folded over.   |
| LA 111G<br>LA 211G | In SWBs, the open drums from packaging configurations LA 111A, LA 111B, LA 211A, and LA 211B above are packaged in a maximum of one bag-out bag (assumed to be equivalent to a twist-and-tape liner bag) and then placed in an SWB lined with a maximum of one fold-and-tape SWB liner bag. SWBs will have 2 or 4 filters installed. |
| LA 111H<br>LA 211H | In SWBs, the open drums from packaging configurations LA 111A, LA 111B, LA 211A, and LA 211B above are placed in an SWB lined with a maximum of two fold-and-tape SWB liner bags. SWBs will have 2 or 4 filters installed.   |

\* If drums are overpacked in an SWB, no closed liner bags are used in the SWB. SWB configurations are for waste in a 55-gallon drum repackaged in an SWB. Drum lids are removed, allowing the payload configuration to be considered a direct-load SWB, and not an SWB Overpack. All layers of confinement inside the drum have been opened or breached. Additional packaging around the drum, if any, is described in the table above.

ASSAY: Drums are assayed by means of a neutron or gamma counter according to written procedures. The instrument used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: Cement is used to bound free water by either direct cementation with sludge or the drum is initially filled with approximately six to eight pounds of cement and the sludge is then placed into the drum with an additional six to eight pounds of cement added on top of the sludge. Drums will be examined by RTR to ensure the continued absence of any free liquids prior to shipment to WIPP.

EXPLOSIVES/COMPRESSED GASES: The waste is produced in a closed system which precludes any mechanism in the process from producing compressed gas or the introduction of extraneous material such as pressure vessels or explosives. Neither the ingredients nor the finished cement is explosive.

PYROPHORICS: No pyrophoric materials have been identified in this waste form and are prohibited by waste packaging procedures. In addition, any pyrophorics placed in this aqueous system would react with the water, and immobilization in cement renders pyrophorics non-reactive.

CORROSIVES: No corrosives have been identified in this waste. Precipitated sludges are chiefly hydroxides with a pH of less than 12.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the tables of allowable materials for Waste Material Type I.2 (LA 111A/211A, LA 111B/211B, LA 111G/211G, and LA 111H/211H) in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be used without a lid or will have a minimum 0.3-inch diameter hole. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LA 112, LA 212 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Organic Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: Solidified organic TRU waste is generated from plutonium processing activities at Los Alamos facilities.

GENERATING SOURCES: The waste originates from TA-55 at LANL.

WASTE FORM: Solidified organics consist of absorbed or solidified oils and organic liquids.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description   |
|--------------------|---|
| LA 112A<br>LA 212A | Absorbed or solidified organic liquid waste is packaged within a maximum of two plastic bags, or in an unsealed metal can within a single plastic bag. Bags are closed by the twist, tie, and tape method. Bagged out items are placed in a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags, which are folded over, without closures. If drums are overpacked in an SWB, no closed liner bags are used in the SWB. |

ASSAY: Drums are assayed by means of a neutron or gamma counter according to written procedures. Which instrument is used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: The oil or organic liquid is solidified by mixing with an absorbent material or solidifying agent in a controlled process per written procedures. Each drum is inspected for the absence of free liquids prior to closure. The final solidified waste form contains no free liquids. RTR examination of a sample of these drums may be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited in TA-55 waste and no vessels or cans potentially containing gases under pressure are present in the waste stream.

PYROPHORICS: No pyrophoric materials will be present as determined by visual inspection of each waste item in accordance with written procedures.

CORROSIVES: Visual inspections of each waste item for corrosive materials are performed in accordance with written procedures. Corrosive materials identified during the inspection are either neutralized or diverted from the waste stream.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type IV.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LA 114, LA 214 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Solidified Inorganic Process Solids

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: Process residues and leached solids are from the processing of plutonium at the Los Alamos Plutonium Facility (TA-55). The final waste product is obtained by immobilization with cement.

GENERATING SOURCE: The waste originates from TA-55 at LANL.

WASTE FORM: Solidified inorganic process solids (process residue from evaporator bottoms and other discarded solutions, process leached solids, ash, filter cakes, salts, metal oxides, fines, etc.) are immobilized in cement to form a solid monolith. The waste form may contain trace (<1% weight) organics.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| LA 114A<br>LA 214A | <p><u>One-Gallon Cement Fixation Process</u></p> <p>In the one-gallon cement fixation process, the waste was mixed with cement in one-gallon cans to form a solid matrix. The one-gallon cans served only as mixing containers for the cement parts and not as the ultimate packaging confinement. The one-gallon cans were then placed in a 55-gallon drum. The packaging within the drum included a 1/16-inch thick lead sheet, a 5-mil plastic bag, and a 12-mil plastic bag that contains the cans. The lead serves as a shielding material for gamma radiation to reduce personnel exposure during drum mixing and subsequent drum handling. The lead shielding consists of two disks, placed at the top and bottom of a 1/16-inch thick lead sheet fitted to the inside circumference of the drum wall. All bag closures are by the twist-and-tape method.</p>   |
| LA 114B<br>LA 214B | <p><u>55-Gallon Cement Fixation Process</u></p> <p>In the 55-gallon cement fixation process, the waste is mixed with cement and water in a 90-mil thick polyethylene mixing container to form a solid monolith. The mixing container is used only as a container for the cement paste and is not considered as an integral part of the packaging. The packaging within the drum includes a 1/16-inch thick lead sheet, a 5-mil plastic bag, and a 12-mil plastic bag. The 12-mil bag contains the 1/8-inch polyethylene mixing container. One or more two-inch thick styrofoam disks are placed on top of the 12-mil outer bag as bracing for the top lead sheet. The lead serves as a shielding material for gamma radiation to reduce personnel exposure during drum loading and subsequent drum handling. The lead shielding consists of two disks, placed at the top and bottom of a 1/16-inch thick lead sheet fitted to the inside circumference of the drum wall. All bag closures are by the twist and tape method or the twist, tie, and tape method.</p> |
| LA 114C<br>LA 214C | <p>Waste from LA 114A, LA 114B, LA 214A, and LA 214B is repackaged in a 55-gallon drum with all plastic bags breached. The punctured bags are not considered to be part of the packaging; therefore, there are no layers of confinement.</p>   |

| Code               | Description*  |
|--------------------|---|
| LA 114E<br>LA 214E | Waste is placed directly into a slip-top metal can and then placed into a pipe component. The metal can may be bagged out and/or placed into another slip-top metal can. Once the material is emplaced, the pipe component lid with filter is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner with packing material between the pipe component and liner. The rigid liner has a one-inch diameter opening or will be punctured with a 0.3-inch diameter hole. The inner plastic bag used for bagging out the waste will be twisted and taped. |

\*If drums are overpacked in an SWB, no closed liner bags are used in the SWB.

ASSAY: Drums are assayed by means of a neutron or gamma counter according to written procedures. The instrument used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: The TRU process solids and discardable liquids are cast into a solid monolith by mixing with cement in a controlled process per written procedures. Each monolith drum or container is inspected for hardness and the absence of free liquids prior to drum closure. The final concrete waste form contains no free liquids. RTR examination of these drums will be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Neither the ingredients nor the finished cement is explosive. Explosives are prohibited at TA-55. No pressure vessels or spray cans that can contain gases under pressure enter these waste streams. Strong acids that might react with other materials to generate gases are neutralized so that reaction is no longer possible. The waste is produced in a closed system which precludes any mechanism in the process from producing compressed gas or the introduction of extraneous material such as pressure vessels or explosives.

PYROPHORICS: No pyrophoric materials have been identified in this waste form and are prohibited by waste packaging procedures. In addition, immobilization in cement renders pyrophorics non-reactive.

CORROSIVES: The TRU process solids and other discardable solutions are to be solidified with cement per written procedures. No corrosives have been identified in this waste. The final form of the waste is a dry, solid monolith, which is noncorrosive.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.3 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters.



SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: LA 115, LA 215 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Graphite Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: Graphite waste is generated from plutonium processing activities at Los Alamos facilities.

GENERATING SOURCES: The waste originates from TA-55 at LANL.

WASTE FORM: The waste consists of discarded graphite mold and furnace equipment from plutonium casting operations, etc., which may contain some small fraction of combustible waste such as plastics (mainly packaging), etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| LA 115A<br>LA 215A | The waste is placed into an unsealed tin or stainless steel can, which is then placed into a maximum of three plastic bags. All bag closures are by the twist and tape, or the twist, tie, and tape method. Bagged out items are placed in a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over, without closures. |
| LA 115B<br>LA 215B | The waste is packaged within a single filtered inner plastic bag. The bag closure is by the twist, tie, and tape method. Bagged out items are placed into a 55-gallon drum lined with two 5-mil plastic bags. Liner bags are folded over without closures.   |

\*If drums are overpacked in an SWB, no closed liner bags are used in the SWB.

ASSAY: Each waste item is assayed prior to placement into a drum. Drums are assayed by means of a thermal neutron coincidence counter or segmented gamma scan counter according to written procedures. The instrument used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: Visual inspections of each waste item for free liquids are performed in accordance with written procedures. Special emphasis during waste inspection is always applied to containers such as bottles and cans. RTR examination of a sample of these drums may be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited in TA-55 waste. Only used pressure vessels or spray cans could potentially contain gases under pressure and they are blocked open, punctured, completely flattened, or cut in half in accordance with written procedures.

PYROPHORICS: No pyrophoric materials will be present as determined by visual inspection of each waste item in accordance with written procedures.

CORROSIVES: Visual inspections of each waste item for corrosive materials are performed in accordance with written procedures. Corrosive materials identified during this inspection are either neutralized or diverted from the waste stream.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LA 116, LA 216 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Combustible Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: Combustible TRU waste is generated from plutonium processing activities at Los Alamos facilities.

GENERATING SOURCES: The waste originates from TAs 03-29 (CMR), 48, 50-1, and 55 at LANL.

WASTE FORM: Combustible solids consist of paper, rags, plastic, rubber, etc., which may contain some small fraction of absorbed oils and noncombustible solids as scrap metals, etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| LA 116A<br>LA 216A | Waste is packaged within a maximum of two layers of plastic bags. All bag closures are by the twist and tape method. Bagged out items are placed into a 55-gallon drum lined with a maximum of two 5-mil plastic bags.   |
| LA 116B<br>LA 216B | Waste is packaged within a maximum of two layers of plastic bags. The bags are filtered. The bags are closed by either the twist and tape method or the twist, tie, and tape method. Bagged out items are placed into a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.   |
| LA 116C<br>LA 216C | Waste is packaged either in an unsealed metal can within a single plastic bag or directly into one plastic bag. All bag closures are by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.                  |
| LA 116D<br>LA 216D | Waste is packaged within a maximum of two layers of plastic bags. The bags are closed by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.   |
| LA 116E<br>LA 216E | Waste is packaged either in an unsealed metal can within a single filtered plastic bag or directly into one filtered plastic bag. All bag closures are by either the twist and tape method or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures. |
| LA 116F<br>LA 216F | Waste is packaged either in an unsealed metal can within a single filtered drum liner bag or into one filtered drum liner bag. The bag closure is by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. The outer two liner bags are folded over without closures.        |

| Code               | Description*  |
|--------------------|---|
| LA 116G<br>LA 216G | Waste is packaged in a 55-gallon drum, an SWB, or a TDOP within plastic bags that have been breached upon repackaging. The punctured bags are not considered to be part of the packaging; therefore, there are no layers of confinement.<br><br>Oversized waste items may be wrapped in plastic and placed in an SWB or a TDOP. No closed liner bags are used in the SWB or TDOP.   |
| LA 116H<br>LA 216H | Waste is packaged in a maximum of three layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two polyethylene liner bags. All bag closures are by the twist and tape method, or the twist, tie, and tape method.   |
| LA 116I<br>LA 216I | Waste is packaged in a maximum of four layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method, or the twist, tie, and tape method.   |
| LA 116J<br>LA 216J | Waste is placed directly into a metal can and then placed into a pipe component. The metal can may be bagged out and/or placed in another can. Once the material is emplaced, the pipe component lid with filter is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner with packing material between the pipe component and liner. The rigid liner will be punctured. The inner plastic bags used for bagging out the waste will be twisted and taped. |

\*If drums are overpacked in an SWB or in a TDOP, no closed liner bags are used in the SWB or TDOP.

ASSAY: Drums are assayed by means of a neutron or gamma counter according to written procedures. The instrument used depends on the matrix and nuclide content of the drum. SWBs and TDOPs are assayed by means of a portable nondestructive assay hold-up system according to written procedures. The results of the assay are expressed in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: Visual inspections of each waste item for free liquids are performed in accordance with written procedures. Special emphasis during waste inspection is always applied to containers such as bottles and cans. RTR examination of a sample of these drums may be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited at TA-03-29, TA-48, and TA-50-1; and in TA-55 waste. Only used pressure vessels or spray cans could potentially contain gases under pressure and they are blocked open, punctured, completely flattened, or cut in half in accordance with written procedures.

PYROPHORICS: No pyrophoric materials will be present as determined by visual inspection of each waste item in accordance with written procedures.

CORROSIVES: Visual inspections of each waste item for corrosive materials are performed in accordance with written procedures. Corrosive materials identified during this inspection are either neutralized or diverted from the waste stream.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: LA 117, LA 217 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Metal Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: TRU metal waste is generated from plutonium processing activities at the Los Alamos facilities.

GENERATING SOURCES: The waste originates from TAs 03-29 (CMR), 48, 50-1, and 55 at LANL.

WASTE FORM: TRU metal waste consists of process equipment, motors, pumps, tools, etc., and may contain some glass, ceramic, porcelain, etc., as well as some small fraction of combustible waste, such as plastics (mainly packaging), etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| LA 117A<br>LA 217A | The waste is packaged within a maximum of four layers of plastic bagging prior to placement in the unlined SWB. All bag closures are by either the twist and tape method, or the twist, tie, and tape method.  |
| LA 117B<br>LA 217B | Waste is packaged either in an unsealed metal can within a single plastic bag or directly into one plastic bag. All bag closures are by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.                    |
| LA 117C<br>LA 217C | Waste is packaged either in an unsealed metal can within a single filtered plastic bag or directly into one filtered plastic bag. All bag closures are by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.  |
| LA 117D<br>LA 217D | Waste is packaged within a maximum of two layers of plastic bags. The bags are closed by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.   |
| LA 117E<br>LA 217E | Waste is packaged in a filtered metal can within a single plastic bag. All bag closures are by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.   |
| LA 117F<br>LA 217F | Waste is packaged either in an unsealed metal can within a single filtered drum liner bag or directly into one filtered drum liner bag. The bag closure is by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. The outer two liner bags are folded over without closures. |

| Code               | Description*  |
|--------------------|---|
| LA 117G<br>LA 217G | Waste is packaged in a 55-gallon drum, an SWB, or a TDOP within plastic bags that have been breached upon repackaging. The punctured bags are not considered to be part of the packaging; therefore, there are no layers of confinement.<br><br>Oversized waste items may be wrapped in plastic and placed in an SWB or in a TDOP. In this packaging configuration, no closed liner bags are used in the SWB or TDOP. |
| LA 117H<br>LA 217H | Waste is packaged in a maximum of three layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method or the twist, tie, and tape method.   |
| LA 117I<br>LA 217I | Waste is packaged in a maximum of two inner plastic bags. Bagged out items are placed in an SWB lined with a maximum of two plastic liner bags or a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by either the twist and tape method, or the twist, tie, and tape method.  |
| LA 117J<br>LA 217J | Waste is packaged in a maximum of four layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method, or the twist, tie, and tape method.   |

\*If drums are overpacked in an SWB or in a TDOP, no closed liner bags are used in the SWB or TDOP.

ASSAY: Drums are assayed by means of a neutron or gamma counter according to written procedures. Which instrument is used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present.

SWBs and TDOPs are assayed by means of a portable nondestructive assay hold-up system according to written procedures. The results of the assay are expressed in terms of grams of each radionuclide present. For LA 117A/217A, each SWB will then be assayed by a PAN assay system.

Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: Visual inspections of each waste item for free liquids are performed in accordance with written procedures. Special emphasis during waste inspection is always applied to containers such as bottles and cans. In addition, special emphasis is always applied to motors and pumps to assure that all liquids are properly drained and/or solidified. RTR examination of a sample of these drums may be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited at TA-03-29, TA-48, and TA-50-1; and in TA-55 waste. Only used pressure vessels or spray cans could potentially contain gases under pressure and they are blocked open, punctured, completely flattened, or cut in half in accordance with written procedures.

PYROPHORICS: No pyrophoric materials will be present as determined by visual inspection of each waste item in accordance with written procedures.

CORROSIVES: Visual inspections of each waste item for corrosive materials are performed in accordance with written procedures. Corrosive materials identified during the inspection are either neutralized or diverted from the waste stream.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: LA 118, LA 218 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Glass Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: TRU glass waste is generated from plutonium processing activities at the Los Alamos Plutonium Facility (TA-55).

GENERATING SOURCES: The waste originates from TAs 03-29 (CMR), 48, 50-1, and 55 at LANL.

WASTE FORM: TRU glass waste consists of discarded labware, windows, bottles, ceramics, etc., which may contain some small fraction of combustible waste, such as plastics (mainly packaging), etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| LA 118A<br>LA 218A | The waste is packaged in a filtered tin or stainless steel can and bagged out in one layer of plastic bagging prior to placement in the drum. The drum used is a 55-gallon drum lined with two 5-mil plastic bags. All bag closures are by the twist and tape method.                               |
| LA 118B<br>LA 218B | Waste is packaged within a single plastic bag. The bag closure is by the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures. |
| LA 118C<br>LA 218C | Waste is packaged within a single filtered drum liner bag. The bag closure is by the twist, tie, and tape method. Bagged out items are placed into a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. The outer two liner bags are folded over without closures.           |
| LA 118D<br>LA 218D | Waste is packaged in an SWB, a TDOP, or a 55-gallon drum within plastic bags that have been breached upon repackaging. The punctured bags are not considered to be part of the packaging; therefore, there are no layers of confinement.  |
| LA 118E<br>LA 218E | Waste is packaged in a maximum of three layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method or the twist, tie, and tape method.   |
| LA 118F<br>LA 218F | Waste is packaged within a single filtered inner plastic bag. The bag closure is by the twist, tie, and tape method. Bagged out items are placed into a 55-gallon drum lined with two 5-mil plastic bags and no rigid drum liner. Liner bags are folded over without closures.                      |
| LA 118G<br>LA 218G | Waste is packaged in a maximum of four layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method, or the twist, tie, and tape method.   |

\*If drums are overpacked in SWBs, no closed liner bags are used in the SWB.

ASSAY: For LA 118A/218A, each waste item is assayed prior to placement into a drum. Drums are assayed by means of a neutron or gamma counter according to written procedures. Which instrument is used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: Visual inspections of each waste item for free liquids are performed in accordance with written procedures. Special emphasis during waste inspection is always applied to containers such as bottles and cans. RTR examination of a sample of these drums may be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited in TA-55 waste. Only used pressure vessels or spray cans could potentially contain gases under pressure and they are blocked open, punctured, completely flattened, or cut in half in accordance with written procedures.

PYROPHORICS: No pyrophoric materials will be present as determined by visual inspection of each waste item in accordance with written procedures.

CORROSIVES: Visual inspections of each waste item for corrosive materials are performed in accordance with written procedures. Corrosive materials identified during the inspection are either neutralized or diverted from the waste stream.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LA 119, LA 219 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Filter Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: TRU filter waste is generated from plutonium processing activities at the Los Alamos Plutonium Facility (TA-55).

GENERATING SOURCES: The waste originates from TAs 03-29 (CMR), 48, 50-1, and 55 at LANL.

WASTE FORM: Filter waste consists of HEPA filters and filter media, and some small fraction of glass, metal, other combustible waste, etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| LA 119A<br>LA 219A | Waste is packaged within a single plastic bag, which is closed by the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic liner bags. Liner bags are folded over, without closures.   |
| LA 119B<br>LA 219B | Waste is packaged within a single filtered plastic bag. All bag closures are by the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic liner bags. Liner bags are folded over, without closures.   |
| LA 119C<br>LA 219C | Waste is packaged within a single filtered drum liner bag. The bag closure is by the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. The outer two liner bags are folded over without closures.  |
| LA 119D<br>LA 219D | Waste is packaged in a 55-gallon drum, an SWB, or a TDOP within plastic bags that have been breached upon repackaging. The punctured bags are not considered to be part of the packaging; therefore, there are no layers of confinement.<br><br>Oversized waste items may be wrapped in plastic and placed in an SWB or a TDOP. No closed liner bags are used in the SWB or the TDOP. |
| LA 119E<br>LA 219E | Waste is packaged in a maximum of three layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method or the twist, tie, and tape method.   |
| LA 119F<br>LA 219F | Waste is packaged in a maximum of four layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method, or the twist, tie, and tape method.   |

\*If drums are overpacked in an SWB, no closed liner bags are used.

ASSAY: Drums are assayed by means of a neutron or gamma counter according to written procedures. Which instrument is used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present. SWBs are assayed by means of a portable nondestructive assay hold-up system according to written procedures. The results of the assay are expressed

in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: Visual inspections of each waste item for free liquids are performed in accordance with written procedures. RTR examination of a sample of these drums will be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited in TA-55 waste. Only used pressure vessels or spray cans could potentially contain gases under pressure and they are blocked open, punctured, completely flattened, or cut in half in accordance with written procedures.

PYROPHORICS: No pyrophoric materials will be present as determined by visual inspection of each waste item in accordance with written procedures.

CORROSIVES: Visual inspections of each waste item for corrosive materials are performed in accordance with written procedures. Corrosive materials identified during the inspection are either neutralized or diverted from the waste stream.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: LA 120, LA 220 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Isotopic Source Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: The waste consists of sealed sources.

GENERATING SOURCE: These wastes are generated from various operations or are repackaged at LANL.

WASTE FORM: The waste consists of solid, inorganic source material and sources sealed in metal jackets. Sources may include well logging sources used for oil exploration, neutron sources for university research, heat sources, cardiac pacemaker components (source capsules, batteries, and pacemakers), gamma gauges, gauge sources (moisture density gauges, level gauges, bone density gauges), calibration sources (smoke detectors and instrument calibration), and X-ray fluorescence sources for scientific and research applications. Source constituents may include americium-241, plutonium-238, plutonium-239, cesium-137, and beryllium.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table.

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| LA 120A<br>LA 220A | The isotopic source is sealed in a metal jacket and/or placed in a metal can. The metal jacket/can is then placed in a pipe component. |

ASSAY: The waste consists of manufactured, sealed isotopic sources. Radiological data are typically well documented by the manufacturer for these sources. Therefore, the isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless documentation is not available. If necessary, assay for all payload containers shall be performed in accordance with the CH-TRAMPAC.

FREE LIQUIDS: There are no free liquids in this waste.

EXPLOSIVES/COMPRESSED GASES: There are no explosives and/or compressed gases in this waste.

PYROPHORICS: There are no pyrophorics in this waste.

CORROSIVES: There are no corrosives in this waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each pipe component and each drum is fitted with a minimum of one filter vent, and the rigid liner (if present) is punctured. Site personnel shall ensure that packaged isotopic source wastes comply with the external radiation dose rate limits for the payload container and the packaging, as stated in the CH-TRAMPAC.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LA 122, LA 222 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solid Inorganic Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: Solid inorganic waste is generated from plutonium processing activities at Los Alamos facilities.

GENERATING SOURCES: The waste originates from TA-55 at LANL.

WASTE FORM: The waste consists of (1) ash from the thermal decomposition of contaminated cleaning rags or (2) evaporator bottoms or filter cakes mixed with glass frit in a vitrified waste form or (3) non-hydrogenous, non-metallic, solids such as concrete. Concrete waste from demolition activities may include incidental metal, pipes, and wires.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| LA 122A<br>LA 222A | <p>The ash waste is placed into a filtered tin or stainless steel can, which is then placed into a filtered plastic bag. The non-hydrogenous, non-metallic solids including concrete from demolition with incidental metal and wires are placed in a filtered metal can. Bagged out items are placed in a pipe overpack or 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over, without closures.</p> <p>The vitrified waste form is poured in an unfiltered stainless steel can. The can is placed in a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over, without closures.</p> |
| LA 122B<br>LA 222B | Non-hydrogenous, non-metallic solids such as concrete from demolition including incidental metal and wires is packaged in a filtered inner plastic bag, which will be placed in a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over, without closure.  |
| LA 122C<br>LA 222C | Waste is packaged either in an unsealed metal can within a single filtered plastic bag or directly into one filtered plastic bag. All bag closures are by either the twist-and-tape method or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.  |

\* If drums are overpacked in an SWB, no closed liner bags are used in the SWB.

ASSAY: Drums are assayed by means of a neutron or gamma counter according to written procedures. Which instrument is used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present.

Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: No free liquids are present in the waste form. RTR examination of a sample of these drums may be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited in TA-55 waste and no vessels or cans potentially containing gases under pressure are present in the waste stream.

PYROPHORICS: No pyrophoric materials will be present in the waste form.

CORROSIVES: No corrosive materials are present in this waste form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be used without a lid. Each SWB is fitted with at least two and up to four filters. Each pipe component is fitted with a minimum of one filter and is overpacked in a filtered 55-gallon drum to form a pipe overpack. Each TDOP is fitted with a minimum of nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LA 123, LA 223 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Lead Rubber and Metal Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: TRU lead rubber and metal waste is generated from plutonium processing activities at the Los Alamos Plutonium Facility (TA-55).

GENERATING SOURCES: The waste originates from TA-55 at LANL.

WASTE FORM: TRU lead rubber waste consists of discarded lead-lined glovebox gloves and may contain other combustible items and some small fraction of noncombustible solids such as scrap metals, etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| LA 123A<br>LA 223A | The waste is double bagged prior to placement in 55-gallon drums. The drum is lined with two 5-mil plastic bags. Occasionally, a 1/8-inch plastic liner is used in the packaging of heavy, bulky, sharp-edged metal items (liner is used without a lid). All bag closures are by either the twist and tape method or the twist, tie, and tape method.                                    |
| LA 123B<br>LA 223B | Waste is packaged either in an unsealed metal can within a single plastic bag or directly into one plastic bag. All bag closures are by the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.                   |
| LA 123C<br>LA 223C | Waste is packaged either in an unsealed metal can within a single filtered plastic bag or directly into one filtered plastic bag. All bag closures are by the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures. |
| LA 123D<br>LA 223D | Waste is packaged within a maximum of two layers of plastic bags. The bags are filtered. All bag closures are by the twist, tie, and tape method. Bagged out items are placed into a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.  |
| LA 123E<br>LA 223E | Waste is packaged either in an unsealed metal can within a single filtered liner bag, or directly into one filtered liner bag. The bag closure is by the twist, tie, and tape method. Bagged out items are placed into a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. The outer two liner bags are folded over without closures.                            |
| LA 123F<br>LA 223F | Waste is packaged in an unlined SWB, an unlined TDOP, or a 55-gallon drum within plastic bags that have been breached upon repackaging. The punctured bags are not considered to be part of the packaging; therefore, there are no layers of confinement.  |
| LA 123G<br>LA 223G | Waste is packaged in a maximum of three layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method or the twist, tie, and tape method.  |

| Code               | Description*  |
|--------------------|---|
| LA 123H<br>LA 223H | Waste is packaged in a maximum of four layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method, or the twist, tie, and tape method. |

\* If drums are overpacked in SWBs, no closed liner bags are used in the SWB.

**ASSAY:** For LA 123A/223A, each waste item is assayed prior to placement into a drum. Drums are assayed by means of a neutron or gamma counter according to written procedures. Which instrument is used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

**FREE LIQUIDS:** Visual inspections of each waste item for free liquids are performed in accordance with written procedures. Special emphasis during waste inspection is always applied to containers such as bottles and cans. RTR examination of a sample of these drums may be performed to verify that free liquids are not present.

**EXPLOSIVES/COMPRESSED GASES:** Explosives are prohibited in TA-55 waste. Only used pressure vessels or spray cans could potentially contain gases under pressure, and they are blocked open, punctured, completely flattened, or cut in half in accordance with written procedures.

**PYROPHORICS:** No pyrophoric materials will be present as determined by visual inspection of each waste item in accordance with written procedures.

**CORROSIVES:** Visual inspections of each waste item for corrosive materials are performed in accordance with written procedures. Corrosive materials identified during the inspection are either neutralized or diverted from the waste stream.

**CHEMICAL COMPATIBILITY:** A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

**PAYLOAD CONTAINER VENTING AND ASPIRATION:** Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

**ADDITIONAL CRITERIA:** In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters.

**SHIPPING CATEGORY:** See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

**MAXIMUM ALLOWABLE WATTAGE:** The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LA 124, LA 224 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Pyrochemical Salt Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: Pyrochemical salt waste is generated from plutonium processing activities at the Los Alamos Plutonium Facility (TA-55).

GENERATING SOURCES: The waste originates from TA-55 at LANL.

WASTE FORM: The waste consists of used chloride salts from pyrochemical processes such as electrowinning, molten salt extraction, salt stripping, fluoride reduction, direct oxide reduction, etc., which may contain some small fraction of combustible waste such as plastics (mainly packaging), etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| LA 124A<br>LA 224A | The waste is placed into a tin or stainless steel can, which is then placed into a plastic bag. All bag closures are by the twist and tape method. Bagged out items are placed in a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags.   |
| LA 124B<br>LA 224B | Waste is packaged either in an unsealed metal can within a single filtered plastic bag or directly into one filtered plastic bag. All bag closures are by either the twist-and-tape method or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.  |
| LA 124C<br>LA 224C | Waste is placed directly into a metal can and then placed into a pipe component. The metal can may be bagged out and/or placed in another can. Once the material is emplaced, the pipe component lid with filter is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner with packing material between the pipe component and liner. The rigid liner will be punctured. The inner plastic bags used for bagging out the waste will be twisted and taped. |

\* If drums are overpacked in an SWB, no closed liner bags are used in the SWB.

ASSAY: Each waste item is assayed prior to placement into a drum. Drums are assayed by means of a neutron or gamma counter according to written procedures. Which instrument is used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: Visual inspections of each waste item for free liquids are performed in accordance with written procedures. Special emphasis during waste inspection is always applied to containers such as bottles and cans. RTR examination of a sample of these drums may be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited in TA-55 waste. Only used pressure vessels or spray cans could potentially contain gases under pressure, and they are blocked open, punctured, completely flattened, or cut in half in accordance with written procedures.

PYROPHORICS: No pyrophoric materials will be present as determined by visual inspection of each waste item in accordance with written procedures. Any small amounts of pyrophoric materials that could be present in the content code are oxidized at high temperatures in the presence of oxygen.

CORROSIVES: Visual inspections of each waste item for corrosive materials are performed in accordance with written procedures. Corrosive materials identified during the inspection are either neutralized or diverted from the waste stream.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with a minimum of nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: LA 125, LA 225 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Mixed Combustible/Noncombustible Waste

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: Mixed Combustible/Noncombustible TRU waste is generated from plutonium processing activities at Los Alamos facilities.

GENERATING SOURCES: The waste originates from TAs 03-29 (CMR), 48, 50-1, and 55 at LANL.

WASTE FORM: Mixtures of combustible and noncombustible waste consist of paper, rags, plastic, rubber, absorbed organic liquids, leaded glovebox gloves, glass, motors, pumps, tools, and miscellaneous metal waste.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| LA 125A<br>LA 225A | The waste is placed into an SWB. A 12-mil plastic sleeve is used as a bag-out bag with one end sealed directly to the inside of the SWB body. After the SWB is filled, the plastic sleeve is gathered with a hose clamp and cut to form a horsetail.   |
| LA 125B<br>LA 225B | Waste is packaged within a single plastic bag. All bag closures are by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.                     |
| LA 125C<br>LA 225C | Waste is packaged within a single filtered plastic bag. All bag closures are by either the twist and tape method, or the twist, tie, and tape method. Bagged out items are placed into an unlined SWB, an unlined TDOP, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. Liner bags are folded over without closures.            |
| LA 125D<br>LA 225D | Waste is packaged within a single filtered drum liner bag. The bag closure is by the twist, tie, and tape method. Bagged out items are placed into an SWB, or a 55-gallon drum lined with a maximum of two 5-mil or greater plastic bags. The two outer liner bags are folded over without closures.   |
| LA 125E<br>LA 225E | Waste is packaged in a 55-gallon drum within plastic bags that have been breached upon repackaging. The punctured bags are not considered to be part of the packaging; therefore, there are no layers of confinement.<br><br>Oversized waste items may be wrapped in plastic and placed in an SWB or a TDOP; no closed liner bags are used in the SWB or TDOP. |
| LA 125F<br>LA 225F | Waste is packaged in a maximum of three layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method or the twist, tie, and tape method.  |
| LA 125G<br>LA 225G | Waste is packaged in a maximum of four layers of inner plastic bags. Bagged out items are placed in a 55-gallon drum lined with a maximum of two plastic liner bags. All bag closures are by the twist and tape method, or the twist, tie, and tape method.  |

| Code               | Description*  |
|--------------------|---|
| LA 125H<br>LA 225H | Waste is placed directly into a metal can and then placed into a pipe component. The metal can may be bagged out and/or placed in another can. Once the material is emplaced, the pipe component lid with filter is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner with packing material between the pipe component and liner. The rigid liner will be punctured. The inner plastic bags used for bagging out the waste will be twisted and taped. |

\* If drums are overpacked in an SWB or in a TDOP, no closed liner bags are used in the SWB or TDOP.

ASSAY: Drums are assayed by means of a neutron or gamma counter according to written procedures. Which instrument is used depends on the matrix and nuclide content of the drum. The results of the assay are expressed in terms of grams of each radionuclide present. SWBs and TDOPs are assayed by means of a portable nondestructive assay hold-up system according to written procedures. The results of the assay are expressed in terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: Visual inspections of each waste item for free liquids are performed in accordance with written procedures. Special emphasis during waste inspection is always applied to containers such as bottles and cans. In addition, for this content code, special emphasis is always applied to motors and pumps to assure that all liquids are properly drained and/or solidified. RTR examination of a sample of these drums may be performed to verify that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited at TA-03-29, TA-48, and TA-50-1; and in TA-55 waste. Only used pressure vessels or spray cans could potentially contain gases under pressure and they are blocked open, punctured, completely flattened, or cut in half in accordance with written procedures.

PYROPHORICS: No pyrophoric materials will be present as determined by visual inspection of each waste item in accordance with written procedures.

CORROSIVES: Visual inspections of each waste item for corrosive materials are performed in accordance with written procedures. Corrosive materials identified during the inspection are either neutralized or diverted from the waste stream.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with a minimum of nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LA 126, LA 226 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Organic Process Solids

GENERATING SITE: Los Alamos National Laboratory (LANL)

WASTE DESCRIPTION: Aqueous effluent and leached solids are from the processing of plutonium at the Los Alamos Plutonium Facility (TA-55). The resultant waste is immobilized in gypsum cement or Portland cement.

GENERATING SOURCES: The waste originates from TA-55 at LANL.

WASTE FORM: Solidified organic process solids (process residue from evaporator bottoms and other discardable solutions, process leached solids, ash, filter cakes, salts, metal oxides, fines, etc.) are immobilized in gypsum cement or Portland cement to form a noncorrosive solid matrix in a 55-gallon drum or a one-gallon can. The waste form will contain a minor amount of organics (one to ten percent by weight).

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| LA 126A<br>LA 226A | <p><u>May 1987 - September 1988: One-Gallon Cement Fixation Process</u><br/>In the one-gallon cement fixation process, the waste was mixed with a cement powder in one-gallon cans to form a noncorrosive solid matrix. The one-gallon cans served only as mixing containers for the cement parts and not as the ultimate packaging confinement. The one-gallon cans were then packaged in a 55-gallon drum. The packaging within the drum included a 1/16-inch thick lead sheet, a 5-mil plastic bag, and a 12-mil plastic bag that contains the cans. The lead serves as a shielding material for gamma radiation to reduce personnel exposure during drum mixing and subsequent drum handling. The lead shielding consists of two disks, placed at the top and bottom of a 1/16-inch thick lead sheet fitted to the inside circumference of the drum wall. All bag closures are by the twist and tape method.</p> <p><u>July 1988 - Present: 55-Gallon Cement Fixation Process</u><br/>The waste is mixed with a cement powder and water in a 1/8-inch thick polyethylene mixing container to form a noncorrosive solid monolith. The mixing container is used only as a container for the cement paste and is not considered as an integral part of the packaging. The packaging within the drum includes a 1/16-inch thick lead sheet and two 12-mil plastic bags. The 12-mil bags contain the 1/8-inch poly mixing container. The lead serves as a shielding material for gamma radiation to reduce personnel exposure during drum loading and subsequent drum handling. The lead shielding consists of two disks, placed at the top and bottom of a 1/16-inch thick lead sheet fitted to the inside circumference of the drum wall. All bag closures are by the twist and tape, or by the twist, tie, and tape method.</p> |
| LA 126B<br>LA 226B | <p><u>July 1988 - Present: 55-Gallon Cement Fixation Process</u><br/>The waste is mixed with a cement powder and water in a 1/8-inch thick polyethylene mixing container to form a noncorrosive solid monolith. The mixing container is used only as a container for the cement paste and is not considered as an integral part of the packaging. The packaging within the drum includes a 1/16-inch thick lead sheet and one 12-mil plastic bag. The 12-mil bag contains the 1/8-inch poly mixing container. The lead serves as a shielding material for gamma radiation to reduce personnel exposure during drum loading and subsequent drum handling. The lead shielding consists of two disks, placed at the top and bottom of a 1/16-inch thick lead sheet fitted to the inside circumference of the drum wall. All bag closures are by the twist and tape, or by the twist, tie, and tape method.</p>   |

| Code               | Description*  |
|--------------------|---|
| LA 126C<br>LA 226C | Waste is packaged in a 55-gallon drum within plastic bags that have been breached upon repackaging. The punctured bags are not considered to be part of the packaging; therefore, there are no layers of confinement. |

\* If drums are overpacked in an SWB, no closed liner bags are used in the SWB.

ASSAY: Aqueous effluent, other discardable solutions, and evaporator salts are sampled for analysis by radiochemical assay methods. The results of assays are expressed in grams per liter of solution. Process leached solids, ash, filter cake, salts, metal oxides, and other leachable solids are assayed by means of neutron or gamma counters according to written procedures. The results of these assays are expressed in the terms of grams of each radionuclide present. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error), plutonium equivalent curies (plus error), and decay heat (plus error).

FREE LIQUIDS: The TRU aqueous effluent is cast into a solid monolith by mixing with gypsum cement or Portland cement in a controlled process per written procedures. Each monolith drum is inspected for hardness and the absence of free liquids prior to drum closure. The final concrete waste form contains no free liquids.

EXPLOSIVES/COMPRESSED GASES: Neither the ingredients nor the finished cement are explosive. Explosives are prohibited in TA-55 waste. No pressure vessels or spray cans that can contain gases under pressure enter these waste streams.

PYROPHORICS: Pyrophorics will be passivated prior to mixing with aqueous solution-cement powder combinations. In addition, any pyrophorics placed in this aqueous system would react with the water and immobilization in cement renders pyrophorics non-reactive.

CORROSIVES: Aqueous effluents and other discardable solutions to be solidified with gypsum cement are neutralized to a pH between 2 and 6 with a caustic solution per written procedures. Aqueous effluents and other discardable solutions to be solidified with Portland cement are neutralized to a pH between 9.5 and 11.5 with a caustic solution per written procedures. Neutralized solutions are mixed with cement to form a noncorrosive solid monolith. Strong acids that might react with other materials to generate gases are neutralized so that reaction is no longer possible.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or will be used without a lid. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LL 111, LL 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: (LL 111A/211A) Solidified Aqueous Waste  
(LL 111B/211B) Tritium Contaminated Inorganic Waste

GENERATING SITE: Lawrence Livermore National Laboratory (LLNL)

WASTE DESCRIPTION: (LL 111A/211A) Solidified aqueous liquids from process lines.  
(LL 111B/211B) Titanium sponges and molecular sieves.

GENERATING SOURCE: (LL 111A/211A) The waste originates from LLNL Buildings 251, 419, and 332.  
(LL 111B/211B) The waste was generated in the Tritium Facility (B-331) at LLNL.

WASTE FORM: (LL 111A/211A) Aquaset or Portland cement is used to solidify water-based liquids. Only trace amounts of organics are present in the aqueous waste streams. Acids and caustics are neutralized to pH 8-12 before solidification.

(LL 111B/211B) This content code consists of the following:

- Titanium tritide in the form of marble size pieces of titanium sponge enclosed inside flow-through metal containers in which some of the titanium has been previously reacted at high temperature with tritium to form  $TiT_2$ ,  $TiHT$ , and  $TiDT$ . The bonding reaction occurs at and above  $300^{\circ}C$ . To reverse the reaction and release the tritium from the titanium, the titanium tritide must be heated to over  $400^{\circ}C$ . Tritium will not be released at temperatures below  $400^{\circ}C$ .
- Tritiated water ( $HTO$  and  $T_2O$ ) adsorbed onto molecular sieves (Linde 5A zeolite, a mineral consisting of alumina, that is, aluminum oxide,  $Al_2O_3$ ). Temperatures of about  $500^{\circ}C$  are required to bake the tritiated water out of a molecular sieve.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| LL 111A<br>LL 211A | Liquids are solidified in individual 1- to 5-gallon open plastic containers, which are packaged in two plastic bags. The double-bagged solidified waste containers are then placed into a 55-gallon drum fitted with a vented high density polyethylene rigid liner. All waste placed in a drum is contained in a third, large plastic bag inside the drum liner. Bags and liners are either polyvinyl chloride or polyethylene. |
| LL 111B<br>LL 211B | The titanium metal sponge is in large pieces about the size of marbles ( $3/8$ to $1/2$ inch), and these metal pieces are enclosed inside open mesh metal containers. The open mesh metal containers are disk shaped, approximately 2-inches thick, and are approximately 8 inches in diameter. The opening size in the metal mesh is small enough to retain the sponge pieces within the container.                             |

| Code                          | Description*  |
|-------------------------------|---|
| LL 111B<br>LL 211B<br>(cont.) | <p>Several of the flow-through metal containers containing the titanium sponge are packed into a 5-gallon aluminum vessel. The density of titanium is 4.05 grams per cubic centimeter, and the density of the sponge is estimated to be no greater than 1 gram per cubic centimeter. Therefore, the maximum quantity of sponge that could be placed inside a single 5-gallon container is 42 pounds. After the sponge containers are placed inside the 5-gallon container, the remaining void space in the container is filled with adsorbent material to prevent the flow-through containers from moving around within the 5-gallon container during normal conditions of transport and hypothetical accident conditions, including handling and shock and vibration conditions. The 5-gallon container lid is sealed with an O-ring seal and is held closed with bolts threaded into the vessel, and the seam of the lid is caulked with RTV. (GE RTV silicone paste Acetoxy-cure, Adhesive Sealant, cures to a rubbery elastomer by reaction of moisture from air with acetoxy groups on a liquid silicone polymer. Chemically, it is composed of silicon, oxygen, carbon, and hydrogen.) Plastic tape is used to cover the RTV. These vessels, when sealed, contain air at a pressure of 1 atmosphere. Each 5-gallon container is packaged with Dry-sorb into a 55-gallon drum. The drum has a 4-mil plastic liner bag that is closed by the twist-and-tape method.</p> <p>The titanium tritides (TiT<sub>2</sub>, TiHT, and TiDT) are very stable compounds that are stable in air and in high humidity, and they do not outgas or release hydrogen, deuterium or tritium until the temperature of the metal has been raised to over 400°C. Therefore, the release of tritium from the titanium sponge will not occur within the temperatures expected within the shipping package. Extreme heat (&gt; 400°C) is the only mechanism by which tritium will be released from this configuration. Tritium is not released by damage to drums under hypothetical accident conditions.</p> <p>Therefore, under normal conditions of transport and hypothetical accident conditions, including shock, vibration, and exposure to air and humidity, the hydrogen concentration in any confinement layer within the package will not exceed 5 percent because no hydrogen is released.</p> |

\* If drums are overpacked in SWBs, no liner bags are used in the SWB. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: (LL 111A/211A) LLNL assays drums in Building 332 using an SGS counter, or a combination of calorimetry and gamma counting. In Building 251, individual waste parcels are assayed using gamma spectrometry. Some drums having a low level of activity are assayed with LLNL's High Sensitivity Neutron Instrument, located in Building 331. LLNL may use other instruments, such as active and passive neutron detectors, gamma spectrometers, or an active and passive computed tomography gamma scanner, that meet WIPP requirements. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

(LL 111B/211B) Some tritium assay is performed solely by material balance based on acceptable knowledge, namely, knowledge of the process and ion chamber readings from the glove box where the process took place. Wastes whose initial forms are liquids are assayed by taking a sample, adding scintillation cocktail, and using a liquid scintillation counter.

FREE LIQUIDS: (LL 111A/LL 211A) After the solidification agent is added to the solidified aqueous waste, the waste is allowed to cure for 24 hours. It is then tested to verify the absence of free liquids. LLNL has certified that the waste contains less than 1% by volume of free liquids. (LL 111B/211B) No free liquids are contained in this waste.

EXPLOSIVES/COMPRESSED GASES: (LL 111A/211A) LLNL has certified that the waste does not contain any explosives or compressed gases. (LL 111B/211B) The tritium-contaminated waste was produced and loaded into the containers in a manner that precluded the introduction or production of explosive or compressed gases. None of the waste items by themselves are explosive at ambient temperatures. When

sealed, the internal pressure of the primary container (55-gallon drums or smaller internal containers) will be 1 atmosphere, or less. Very small amounts of hydrogen gas may be generated, as detailed below.

The equilibrated partial pressure of tritium above a titanium sponge is  $1 \times 10^{-6}$  torr.

The partial pressure of tritium gas ( $\text{HT}$  or  $\text{T}_2$ ) above molecular sieves would not be substantially different from that of hydrogen above any liquid water (for example, water adsorbed onto a kitchen sponge), and therefore would not be explosive.

18keV beta particles (electrons) from tritium decay can radiolytically hydrolyze water. However, the water adsorbed onto a molecular sieve exists as an essentially monomolecular layer. Therefore, the decay electron will most likely interact with the sieve or with air, rather than with the thin sheet of water.

The OH remaining after a tritium decay in an HTO molecule could make  $\text{H}_2\text{O}_2$  and evolve  $\text{H}_2$  ( $2 \text{H}_2\text{O} + 2\text{OH} \rightarrow 2\text{H}_2\text{O}_2 + \text{H}_2$ ). However, experiments show that the slight overpressure that develops in a sealed container containing tritium is consistent with the evolution of the decay product  ${}^3\text{He}({}^3\text{H} \rightarrow {}^3\text{He} + \text{e})$ , with no significant hydrogen component.

Prior to shipment, sampling will be performed on selected primary containers for internal pressure and hydrogen concentration to verify that the shipping package limits on pressure and hydrogen concentration are not exceeded during the 60-day shipping period.

PYROPHORICS: LLNL has certified that the waste does not contain any pyrophorics. No pyrophoric materials have been identified in this waste form. Pyrophorics are prohibited by waste packaging procedures.

CORROSIVES: LLNL has not identified any unneutralized corrosive materials in this waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace ( $>1\%$  weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.1 in the CH-TRAMPAC. All waste is chemically compatible to and between the containers and with the inner containment vessel and O-ring seals.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: LL 113, LL 213 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Liquid and Fine Particle Waste

GENERATING SITE: Lawrence Livermore National Laboratory (LLNL)

WASTE DESCRIPTION: Solidified waste from process lines including alcohols, acids, bases, and other aqueous solutions; also, oil-based liquids, solvents, and fine particles (primarily graphite).

GENERATING SOURCE: The waste originates from LLNL Buildings 251, 332, and 419. Building 419 has not been used to solidify TRU waste since 1989.

WASTE FORM: Only trace amounts of organics are present in the aqueous (water-based) waste streams. Oil-based liquids are considered 100% organic by weight. Acids and bases have a variable organic content; therefore, they are assumed 100% organic by weight. Aquaset is used to solidify water-based liquids, acids, and bases after neutralizing to pH 6 to 8. Portland cement was formerly used to solidify water-based liquids. Petroset is used to solidify organics (oils, solvents, etc.). Envirostone was formerly used to solidify oil-based liquids and solvents. Fine particles are generally mixed in with the Aquaset, Petroset, or Portland cement solidifications.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| LL 113A<br>LL 213A | Liquids are solidified in individual 1- to 5-gallon plastic containers. Formerly, 1-gallon metal paint cans were used in B-419. The double bagged solidified waste containers are placed into a 55-gallon drum fitted with a vented high density polyethylene rigid liner. The solidification containers, although sometimes closed with a lid, are not themselves sealed. Each solidification container is wrapped in two plastic bags. All waste is then placed in a third large plastic bag inside the drum liner. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. All bag closures are in accordance with the CH-TRAMPAC. |

ASSAY: LLNL assays drums in Building 332 using an SGS, or a combination of calorimetry and gamma counting. In Building 251, individual waste parcels are assayed using gamma spectrometry. Some drums having a low level of activity are assayed with LLNL's High Sensitivity Neutron Instrument, located in Building 331. LLNL may use other instruments, such as active and passive neutron detectors, gamma spectrometers, or an active and passive computed tomography gamma scanner, that meet WIPP requirements. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: After the solidification agent is added, the waste is allowed to cure. It is then tested to verify the absence of free liquids. LLNL has certified that the waste contains less than 1% by volume of free liquids.

EXPLOSIVES/COMPRESSED GASES: LLNL has certified that the waste does not contain any explosives or compressed gases.

PYROPHORICS: LLNL has certified that the waste does not contain any pyrophorics.

CORROSIVES: LLNL has certified that the waste does not contain any corrosive materials.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type IV.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LL 116, LL 216 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Combustible Waste

GENERATING SITE: Lawrence Livermore National Laboratory (LLNL)

WASTE DESCRIPTION: The waste consists of glovebox bagout waste, non-glovebox-line generated laboratory trash, and some contaminated equipment. The waste may occasionally include small quantities of solidified liquids, especially if it is mixed waste, but this is usually segregated as Content Code LL 113A/213A.

GENERATING SOURCE: The waste originates from LLNL Buildings 251 and 332.

WASTE FORM: The waste consists mostly of dry solids such as tissues, paper, assorted plastics, glassware, ceramics and metals. Portland cement or Aquaset is used to solidify water-based liquids; Envirostone or Petroset is used to solidify small amounts of solvents and oil-based liquids. The composition varies considerably, but it is predominantly organics (>90% by weight).

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| LL 116A<br>LL 216A | The waste is packaged in two plastic bags, then placed in a 55-gallon drum fitted with a vented high density polyethylene rigid liner, itself lined inside with a third large plastic bag. Bags and liners are either polyvinyl chloride or polyethylene. All bag closures are by the twist-and-tape or fold-and-tape method.   |
| LL 116B<br>LL 216B | The waste is packaged in three plastic bags, then placed in a 55-gallon drum fitted with a vented high density polyethylene rigid liner, itself lined inside with a third large plastic bag. Bags and liners are either polyvinyl chloride or polyethylene. All bag closures are by the twist-and-tape or fold-and-tape method. |
| LL 116C<br>LL 216C | The waste is packaged in four plastic bags, then placed in a 55-gallon drum fitted with a vented high density polyethylene rigid liner, itself lined inside with a third large plastic bag. Bags and liners are either polyvinyl chloride or polyethylene. All bag closures are by the twist-and-tape or fold-and-tape method.  |

\* If the drums are overpacked in an SWB or a TDOP, no additional liner bags are used in the SWB or the TDOP.

ASSAY: LLNL assays drums in Building 332 using an SGS, or a combination of calorimetry and gamma counting. In Building 251, individual waste parcels are assayed using gamma spectrometry. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error). Some drums having a low level of activity are assayed with LLNL's High Sensitivity Neutron Instrument, located in Building 331. LLNL may use other instruments, such as active and passive neutron detectors, gamma spectrometers, or an active and passive computed tomography gamma scanner that meet WIPP requirements.

FREE LIQUIDS: Liquids are solidified according to procedure and allowed to cure before final sealing of the drum. LLNL has certified that the waste contains less than 1% by volume of free liquids.

EXPLOSIVES/COMPRESSED GASES: LLNL has certified that the waste does not contain any explosives or compressed gases. LLNL procedures call for all aerosol cans to be punctured before placement in a TRU waste drum.

PYROPHORICS: LLNL has certified that the waste does not contain any pyrophorics.

CORROSIVES: LLNL has certified that the waste does not contain any corrosive materials.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LL 119, LL 219 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Filter Waste

GENERATING SITE: Lawrence Livermore National Laboratory (LLNL)

WASTE DESCRIPTION: Filter waste consists of the HEPA filters used for filtering glovebox or room intake and exhaust air or inert gas. The waste may also consist of small TEM filters (MSA cartridge filters from instruments). The waste may occasionally include small quantities of combustible materials such as lab trash, personal protective equipment, and surgical gloves.

GENERATING SOURCE: The waste originates primarily from LLNL Buildings 251 and 332. This waste may be generated at all areas at LLNL where transuranic materials are handled. The majority of HEPA filter waste at LLNL is generated by the Plutonium Facility (Building 332).

WASTE FORM: HEPA filters are of various sizes. The frames are made of wood, or occasionally metal, with an aluminum or steel support structure. The filter is fiberglass-type or Nomex-type medium, but may also be asbestos. In addition, there are several 1000-cfm open-face HEPA filters with gaskets or fluidic seals on room ventilation and large gas handling lines. There are some small MSA-type filters.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| LL 119A<br>LL 219A | <p>The filter inlet and outlet are closed (capped or covered and taped) with a steel or plastic cover. The filter is then normally packaged in two plastic bags and placed, if size allows, in a 55-gallon drum fitted with a vented high-density polyethylene liner. All waste placed in a drum is sealed in a third large plastic bag inside the drum liner. Bags and liners are either polyvinyl chloride or polyethylene. All bag closures are by the twist-and-tape method. Drums are DOT Type A certified and sealed and have filter vents. If the drums are overpacked in SWBs, no additional sealed liner bags are used.</p> <p>HEPA filters may also be placed directly within an SWB with a maximum of two plastic liner bags. The SWB has bracing placed between the waste and the container.</p> |

ASSAY: LLNL assays drums or drum components ("parcels") using an SGS or a combination of calorimetry and gamma counting. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error). A mobile vendor may be contracted to provide WIPP-certified assays should this prove convenient. The contractor may use any of a variety of acceptable radioassay methods, including, for example, imaging passive-active neutron/gamma energy analysis.

FREE LIQUIDS: All filters are dry when packaged. Absence of free liquids is verified by documented generator knowledge ("newly generated" waste) or by RTR. LLNL certifies that the waste contains less than 1% by volume of free liquids.

EXPLOSIVES/COMPRESSED GASES: LLNL certifies that the waste does not contain any explosives or compressed gases.

PYROPHORICS: LLNL certifies that the waste does not contain any pyrophorics.

CORROSIVES: LLNL certifies that the waste does not contain any corrosive materials.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, before shipping, each drum is fitted with a filter, and the rigid liner is punctured to provide venting if it does not already have a vent hole. Each SWB is fitted with at least two filters. Container integrity is assured by visual examination.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: LL 124, LL 224 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Pyrochemical Salt Waste

GENERATING SITE: Lawrence Livermore National Laboratory (LLNL)

WASTE DESCRIPTION: Solid Waste Pyrochemical Salt

GENERATING SOURCE: The waste originates from LLNL Building 332.

WASTE FORM: The waste consists of used chloride and fluoride salts from pyrochemical processes (electrorefining, molten salt extraction, and direct oxide reduction).

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| LL 124A<br>LL 224A | The waste salt is contained in a metal can, which completely encloses the salt. The canned salt is placed in a 55-gallon drum, which is fitted with a vented HDPE liner.  |
| LL 124B<br>LL 224B | The waste salt is contained in a metal can. The metal can completely encloses the salt. These cans are generally contaminated on the outer surface with a small amount of radioactivity. There may be small amounts of organic materials inside the metal can with the contaminated salt blocks. The canned salt is packaged in two plastic bags and placed in a 55-gallon drum. The drum is fitted with a vented HDPE liner. All waste placed in the drum is enclosed in a third large plastic bag inside the drum liner. Bags and liners are either polyvinyl chloride or polyethylene. |

\* If the drums are overpacked in SWBs, no additional closed liner bags are used. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: LLNL assays drums in Building 332 using an SGS, or a combination of calorimetry and gamma counting. Some drums having a low level of activity are assayed with LLNL's High Sensitivity Neutron Instrument, located in Building 331. LLNL may use other instruments, such as active and passive neutron detectors, gamma spectrometers, or an active and passive computed tomography gamma scanner, that meet WIPP requirements. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: None.

EXPLOSIVES/COMPRESSED GASES: LLNL has certified that the waste does not contain any explosives or compressed gases. LLNL procedures call for all aerosol cans to be punctured before placement in a TRU waste drum.

PYROPHORICS: LLNL has certified that the waste does not contain any pyrophorics.

CORROSIVES: LLNL has certified that the waste does not contain any corrosive materials.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The

chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: LL 125, LL 225 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Combined Metal Scrap and Incidental Combustibles

GENERATING SITE: Lawrence Livermore National Laboratory (LLNL)

WASTE DESCRIPTION: This waste form consists of contaminated equipment and laboratory trash that, because of physical size, usually cannot be packaged in 55-gallon drums. For these oversized objects, an SWB or TDOP is used as the waste container. Typical objects that become metal scrap waste include decommissioned glove boxes, hoods, and other large pieces of contaminated equipment (lathes, mills, etc.). The void space around the larger items is sometimes filled with other TRU-contaminated materials similar to Content Code LL 116A/216A. This waste form may also include small quantities of solidified liquids and sludges.

GENERATING SOURCES: The waste originates from LLNL Buildings B-251 and B-332.

WASTE FORM: TRU metal scrap waste consists of decommissioned glove boxes, hoods, and other large pieces of contaminated equipment, as well as other laboratory trash. Typically it will contain metal components, glassware, ceramics, plastics, paper, and wood. Normally, it will be mostly inorganic material, but the content can vary widely. This waste form may also include small quantities of liquids and sludges that have been solidified with either Portland cement, Envirostone, Aquaset, or Petroset, if they were included in a waste parcel from Content Code LL 116A/216A.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| LL 125A<br>LL 225A | All contaminated material is contained in either a maximum of two plastic bags, or no plastic bags for sealed equipment contaminated only on the inside, and placed into a 55-gallon drum, an SWB, or a TDOP. The void spaces around the larger components are sometimes filled with plastic bags of other laboratory trash or with plastic foam packaging material. All bags of contaminated material are closed using the twist and tape method. No additional liner bags are used in the SWB or the TDOP. |

ASSAY: LLNL assays drums in Building 332, using an SGS, or a combination of calorimetry and gamma spectrometry. Parcels may be assayed by gamma spectrometry. Some drums having a low level of activity are assayed with LLNL's High Sensitivity Neutron Instrument, located in Building 331. LLNL may use other instruments, such as active and passive neutron detectors, gamma spectrometers, or an active and passive computed tomography gamma scanner that meet WIPP requirements. Radionuclide content of SWBs and TDOPs is based on data from the Waste Parcel Cards and the Waste Disposal Requisition. These documents contain a description of the waste, including weight and/or activity of the radionuclides. Prior to shipment, each SWB and TDOP will be assayed by an approved method as defined in the CH-TRAMPAC.

FREE LIQUIDS: The waste is visually inspected for free liquids during packaging. Any liquid wastes are solidified as described in the LLNL waste stream "Solidified Liquid and Fine Particle Waste" (see Content Code LL 113A/213A). LLNL has certified that the waste contains less than 1% by volume of free liquids.

EXPLOSIVES/COMPRESSED GASES: LLNL has certified that the waste does not contain any explosives or compressed gases. LLNL procedures call for all aerosol cans to be punctured before placement in a drum, SWB, or TDOP.

PYROPHORICS: LLNL has certified that the waste does not contain any pyrophorics.

CORROSIVES: LLNL has certified that the waste does not contain any corrosive materials.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured or used without a lid. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: MD 111, MD 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: (MD 111A/211A) Solidified Aqueous Waste and (MD 111B/211B) Contaminated Soil

GENERATING SITE: Mound Laboratory (Mound)

WASTE DESCRIPTION: (MD 111A/211A) Aqueous effluent from decontamination and decommissioning activities in former Pu-238 processing areas is processed in WD Building. The sludge, which contains 20-25% solids, is mixed with cement. (MD 111B/211B) The waste consists of soil contaminated to TRU levels with Pu-238 from pipeline breaks and spills. The contaminated fluids are aqueous solutions with a maximum of trace levels of organics in the fluids (if any is present).

GENERATING SOURCE: (MD 111A/211A) The waste originates from SM Building, PP Building, and R Building at Mound. (MD 111B/211B) The waste originates from the WD hillside, pipeline removal at Mound.

WASTE FORM: (MD 111A/211A) The sludge is produced through a standard batch type precipitation process and a pH adjustment. The effluent is filtered, sampled and discharged. The resultant sludge is solidified with approximately two bags of cement. Solids are primarily ferric hydroxides. (MD 111B/211B) The waste is typically clayey soil that has been contaminated by a pipeline break or other type of spill. The soil is removed by hand digging or with a backhoe. It may include small rocks, but usually no large boulders.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| MD 111A<br>MD 211A | The waste is placed in a 55-gallon drum with a 90-mil high density polyethylene liner. There are no other bags or added confinements. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. |
| MD 111B<br>MD 211B | The contaminated soil waste is packaged in SWBs that are utilized with no sealed liner when loading contaminated soil.   |

ASSAY: (MD 111A/211A) A sample of the sludge is taken from each batch, and the type and quantity of radionuclides present are determined using standard radiochemical techniques. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error). (MD 111B/211B) Several representative samples are removed from the box after loading and are evaluated utilizing Mound-developed instrumental assay. An average value is used for the entire box and used to calculate Pu-239 fissile gram equivalent and decay heat.

FREE LIQUIDS: (MD 111A/211A) WD sludge is solidified with cement in accordance with documented written procedures. This operation is periodically audited by QA personnel, as described in the QA plan. Cold samples of this waste form have been examined for the presence of free liquid in or on the concrete matrix, and none was found. These test results are on file at Mound. (MD 111B/211B) A study of water content of a variety of soils likely to be encountered at Mound was performed. The results of this study describe the amount of "Florco" absorbent required to absorb all free liquid created by packing compression. Procedures in Mound manuals document how the absorbent is to be added to the container.

EXPLOSIVES/COMPRESSED GASES: (MD 111A/211A) The sludge waste form has been analyzed and found to contain no explosive items or explosive compounds or material capable of forming explosive mixtures. Areas where TRU waste is generated typically contain no explosive wastes. Administrative controls are in place which preclude the introduction of explosives into TRU waste packages. Administrative controls exist that ban the introduction of cylinders of compressed gases into the waste containers. Aerosol cans are punctured before being discarded as waste. (MD 111B/211B) Criterion not applicable. Mound soils do not contain explosives or compressed gases.

PYROPHORICS: (MD 111A/211A) Analytical procedures have been performed on the sludge, and the results included in this document indicate the absence of pyrophorics in the waste stream. In addition, the solidification operation assures that any small quantities of pyrophorics that might be present are rendered safe by dispersion in the concrete matrix. (MD 111B/211B) Criterion not applicable. Pyrophoric materials and combinations of potentially pyrophoric materials do not exist in Mound soils. Underground piping that may have leaked originated from buildings that did not contain or dispose of pyrophoric materials in this piping.

CORROSIVES: (MD 111A/211A) No corrosive materials have been identified in the aqueous effluent sludge waste per 40 CFR 261 criteria. (MD 111B/211B) Contaminated soils at Mound are primarily the result of leaks in process or transfer lines. While the initial spill might possibly have contained materials that could be classified as hazardous wastes, these materials were changed as the liquid evaporated, leaving the plutonium residue behind such that the remaining material has been rendered nonhazardous. If there is any reason to suspect the presence of hazardous wastes in the TRU-contaminated soils, an analysis will be performed to determine if the waste fails any of the four EPA characteristic tests.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: MD 116, MD 216 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Combustible Waste

GENERATING SITE: Mound Laboratory (Mound)

WASTE DESCRIPTION: TRU combustible wastes consist of paper, plastics, rags, cardboard, and wood generated from glovebox operations and the decontamination and decommissioning program.

GENERATING SOURCES: The waste originates from the PP Building, R Building, and SM Building at Mound.

WASTE FORM: The paper is typically Kimwipes. Plastics consist of gloves, shoecovers, bags, and bubblesuits. Wood is usually plywood or 2 x 4. The 90-mil HDPE drum liner is also considered as part of the combustible loading.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| MD 116A<br>MD 216A | The waste is packaged in 55-gallon drums with a 90-mil HDPE liner. Combustible waste is typically double bagged in 8-mil PVC. A 4-mil polyethylene bag is used to line the 90-mil HDPE drum liner. All bag closures are by the twist and tape method. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. |

ASSAY: After loading, each drum is surveyed using an SGS counter. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: Absorbent is placed into the TRU waste containers for absorption of any minor liquid residue that may be present. The only potential source of free liquids in combustibles are damp rags or Kimwipes, and operations with these are controlled to ensure that no free liquids can develop. Administrative control to preclude the presence of free liquids in TRU waste containers is accomplished by compliance with procedures.

EXPLOSIVES/COMPRESSED GASES: Explosives are not normally handled in areas where TRU combustible waste is packaged. Administrative procedures are in place that control the introduction of such materials into TRU waste containers.

PYROPHORICS: Pyrophoric materials are not normally handled in areas where combustible TRU waste is generated. Pyrophoric materials and combinations of potentially pyrophoric materials are not allowed to be mixed with TRU combustible wastes. The radioactive materials present in the waste are nonpyrophoric. Administrative control to preclude presence of pyrophoric material from TRU waste containers is accomplished by compliance with Mound procedures.

CORROSIVES: Mound technical manuals document the administrative controls that prohibit the introduction of materials into TRU combustible waste packages which could be considered as RCRA hazardous wastes. In rare cases where RCRA hazardous and TRU wastes are commingled, the quantities will be reported in the data package, and the waste package will be properly marked and labeled. Any corrosive materials are rendered noncorrosive before packaging.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: MD 117, MD 217 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Non-combustible TRU Waste

GENERATING SITE: Mound Laboratory (Mound)

WASTE DESCRIPTION: Non-combustible waste consists of glass, metal, and masonry.

GENERATING SOURCE: The waste originates from the PP Building, R Building, and SM Building at Mound.

WASTE FORM: Non-combustible wastes are composed of glass, metal, and masonry, and are generated during routine glovebox operations and during decontamination and decommissioning activities. Glass consists of analytical glassware and occasional reagent bottles. Metal includes tools, laboratory apparatus, gloveboxes, fumehoods, duct work, electrical wire and conduit, piping, pumps, fittings, sheet metal, and other miscellaneous metallic objects. Masonry consists of bricks, concrete block, pieces of poured walls or floors, and plaster.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| MD 117A<br>MD 217A | <p>The waste is placed in both 55-gallon drums and SWBs.</p> <p><u>Drum Preparation</u>: The drum is a 55-gallon drum with a 90-mil HDPE drum liner. Non-combustible waste is typically double bagged in 8-mil PVC. A 4-mil polyethylene bag is used to line the 90-mil HDPE drum liner. All bag closures are by the twist and tape method.</p> <p><u>Box Preparation</u>: Larger metal items are wrapped in polyethylene for contamination control and placed in an SWB. The plastic sheeting is wrapped around the waste and is not taped or closed off like a bag. The box is equipped with at least two filters.</p> |

ASSAY: After loading, both drums and SWBs are assayed by an SGS counter. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: All containers (e.g., tanks, bottles, cans, pumps, etc.) are opened and thoroughly drained of all liquids prior to packaging per procedures documented in Mound technical manuals. In addition, absorbent materials are placed into the TRU waste container for absorption of any minor liquid residue that may remain. Administrative control to preclude presence of other free liquids in addition to those mentioned above is accomplished by compliance with Mound procedures.

EXPLOSIVES/COMPRESSED GASES: All containers (e.g., tanks, cylinders, etc.) are vented to remove all compressed and/or explosive gases. Valve and closure mechanisms are removed to prevent repressurization or entrapment of gases. Areas where TRU waste is generated typically contain no explosive wastes. Administrative controls are in place that preclude the introduction of explosives into TRU waste packages. Administrative control to preclude presence of explosives and compressed gases from TRU waste containers is accomplished by compliance with procedures.

PYROPHORICS: Pyrophoric materials are typically not handled in areas where TRU waste is generated. Pyrophoric materials and combinations of potentially pyrophoric materials are not allowed to be mixed with

TRU noncombustible wastes. The radioactive materials present in the waste are nonpyrophoric. Administrative control to preclude presence of pyrophoric material from TRU waste containers is accomplished by compliance with Mound procedures.

CORROSIVES: Administrative controls are exercised to preclude the introduction of materials into TRU noncombustible waste packages that could possibly be classified as hazardous waste per the RCRA definition. Any corrosive materials are rendered noncorrosive before packaging.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: NT 111, NT 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Aqueous Waste

STORAGE SITE: Nevada Test Site (NTS)

GENERATING SITE: Lawrence Livermore National Laboratory (LLNL)

WASTE DESCRIPTION: The waste consists of solidified aqueous liquids.

GENERATING SOURCE: The waste originates from LLNL Buildings 419 and 332.

WASTE FORM: Portland cement is used to solidify water-based liquids. Only trace amounts of organics are present in the aqueous waste streams. Acids and caustics are neutralized to pH 8 to 12 before solidification.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| NT 111A<br>NT 211A | The waste is placed in 55-gallon drums fitted with a 90-mil polyethylene liner. Liquids are solidified in individual 1-gallon metal paint cans that are then placed in 55-gallon drums. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. |

ASSAY: Depending on the point of origin, LLNL assays drums using an SGS counter, or a combination of calorimetry and gamma counting. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: After the solidification agent is added, the waste is allowed to cure for 24 hours. The paint cans are tipped to verify the absence of free liquids prior to installing the lids.

EXPLOSIVES/COMPRESSED GASES: LLNL has certified that the waste does not contain any explosives or compressed gases. NTS waste acceptance criteria prohibit explosives and compressed gases from being packaged in TRU waste to be stored at NTS.

PYROPHORICS: LLNL has certified that the waste does not contain any pyrophorics. NTS waste acceptance criteria prohibit pyrophorics from being packaged in TRU waste to be stored at NTS.

CORROSIVES: LLNL has not identified any unneutralized corrosive materials in this waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: NT 116, NT 216 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Combustible Waste

STORAGE SITE: Nevada Test Site (NTS)

GENERATING SITE: Lawrence Livermore National Laboratory (LLNL)

WASTE DESCRIPTION: The waste consists of mixed glovebox bagout waste, non-line generated laboratory trash, some contaminated small equipment, and small quantities of solidified liquids and sludges.

GENERATING SOURCE: The waste originates from LLNL Buildings 332 and 251.

WASTE FORM: The waste consists mostly of untreated dry solids such as tissues, paper, assorted plastics, glassware, ceramics, and metals. Portland cement is used to solidify water-based liquids; Envirostone is used to solidify small amounts of solvents and oil-based liquids. The composition varies considerably, but it is predominately organics (>90% by weight).

WASTE PACKAGING: Details of the waste package for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| NT 116A<br>NT 216A | The waste was usually placed in a double plastic bag with two horsetails (taped); then it is placed in a 55-gallon drum fitted with a 90-mil polyethylene liner. All bag closures are by the twist and tape method. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. |

ASSAY: Depending on point of origin, LLNL assays drums using an SGS counter or a combination of calorimetry and gamma counting. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: Liquids are solidified according to procedure and are allowed to cure before final sealing of the drum. NTS waste acceptance criteria prohibit free liquids in excess of 1% by volume in TRU waste to be stored at NTS.

EXPLOSIVES/COMPRESSED GASES: LLNL has certified that the waste does not contain any explosives or compressed gases. LLNL procedures call for all aerosol cans to be punctured before placement in a TRU waste drum. NTS waste acceptance criteria prohibit explosives and compressed gases from being packaged in TRU waste to be stored at NTS.

PYROPHORICS: LLNL has certified that the waste does not contain any pyrophorics. NTS waste acceptance criteria prohibit pyrophorics from being packaged in TRU waste to be stored at NTS.

CORROSIVES: LLNL has not identified any corrosive materials in this waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: NT 119, NT 219 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Filter Waste

GENERATING SITE: Nevada Test Site (NTS)

WASTE DESCRIPTION: Filter waste includes HEPA filters including filter housings and frames.

GENERATING SOURCES: The waste originates from the NTS Waste Examination Facility (Building 5-32).

WASTE FORM: HEPA filters and prefilters of various sizes. The frames are primarily made of metal and can include some wood. The medium is fiberglass, Nomex, or cotton.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

WASTE PACKAGING DESCRIPTION TABLE

| Code               | Description   |
|--------------------|---|
| NT 119A<br>NT 219A | The 55-gallon drum is fitted with a 30-mil open-head (no lid), polyethylene liner. The waste is placed in a single plastic glovebox bag. All bag closures are by the twist-and-tape method. |

ASSAY: All assay will be done by Carlsbad Field Office approved mobile service characterization vendors.

FREE LIQUIDS: All items are visually inspected during repackaging of original waste prior to placement in the payload container. Liquids are solidified and allowed to cure or are absorbed prior to placement into the payload container according to procedures. The placement of all waste into the payload container is video taped. Tapes are reviewed for compliance with repackaging and WIPP WAC compliance.

EXPLOSIVES/COMPRESSED GASES: The NTS inspects all waste for explosives and compressed gases and segregates any suspect items prior to placement in the payload container.

PYROPHORICS: The NTS inspects all waste for pyrophorics and segregates any suspect items prior to placement in the payload container.

CORROSIVES: All liquids are solidified or absorbed and rendered noncorrosive prior to placement in payload containers.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: NT 125, NT 225 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Combustible and Noncombustible Waste

STORAGE SITE: Nevada Test Site (NTS)

GENERATING SITE: (NT 125A/225A) Lawrence Livermore National Laboratory (LLNL)  
(NT 125B/225B) NTS

WASTE DESCRIPTION: (NT 125A/225A) The waste consists of solid combustible and noncombustible mixed glovebox bagout waste and nonline-generated laboratory trash. This waste was derived from research activities performed in a laboratory environment. The waste includes soft plastics, rubber, cardboard, rags, paper, cloth, glass, some contaminated small equipment, and small quantities of solidified liquids and sludges. (NT 125B/NT 225B) The waste consists of solid combustible and noncombustible mixed glovebox bagout waste and nonline-generated laboratory trash. The waste was originally generated at LLNL from research activities and has been repackaged at the NTS. The waste includes soft plastics, rubber, cardboard, rags, paper, cloth, glass, some contaminated small equipment, and small quantities of solidified liquids and sludges.

GENERATING SOURCE: The waste originates from LLNL Buildings 332 and 251.

WASTE FORM: The waste consists mostly of untreated dry solids such as tissues, paper, assorted plastics, glassware, ceramics, and metals. Portland cement is used to solidify water-based liquids. Envirostone is used to solidify small amounts of solvents and oil-based liquids. Composition varies widely from drum to drum.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description   |
|--------------------|---|
| NT 125A<br>NT 225A | Prior to being bagged out of the glovebox, the waste was packaged in paper ice cream cartons, plastic containers (e.g., bottles), or metal cans, all less than four liters in volume. The waste was then typically removed from gloveboxes in up to two plastic glovebox bags. After removal from the glovebox, the plastic bags were placed in temporary storage cans lined with a plastic bag. When the storage can was full, the plastic bags were removed from the storage can and placed in a 55-gallon drum that may be lined with a plastic liner bag and may be fitted with a 90-mil rigid liner. All bag closures are by the twist-and-tape method. If drums are overpacked in an SWB, no closed liner bags are used in the SWB. |
| NT 125B<br>NT 225B | The waste is removed from the original LLNL waste container. All layers of confinement are breached. Lids are removed from all paper, plastic, or metal containers. The waste is then placed in a single plastic glovebox bagout liner bag and then placed in a 55-gallon drum fitted with a 30-mil open-topped (no lid), polyethylene liner. All bag closures are by the twist-and-tape method. If drums are overpacked in an SWB, no closed liner bags are used in the SWB.   |

ASSAY: Assay data were provided by LLNL as part of the acceptable knowledge documentation, and all assay data are verified by Carlsbad Field Office-approved mobile service characterization vendors.

FREE LIQUIDS: (NT 125A/225A) Acceptable knowledge documentation provided by LLNL is used to demonstrate compliance with the restriction on free liquids. All waste drums were examined using the mobile nondestructive examination RTR system developed by LANL for the presence of liquids. All drums to be shipped to WIPP have been found to contain less than 1% free liquids by volume.

(NT 125B/225B) Acceptable knowledge documentation provided by LLNL is used to help demonstrate compliance with the restriction on free liquids. All items are visually inspected during repackaging of

original waste prior to placement in the payload container. Liquids are solidified and allowed to cure or are absorbed prior to placement into the payload container according to procedures. The placement of all waste into the payload container is video taped. Tapes are reviewed for compliance with repackaging and WIPP WAC compliance.

EXPLOSIVES/COMPRESSED GASES: (NT 125A/225A) Acceptable knowledge documentation provided by LLNL is used to ensure that the waste does not contain explosives or compressed gases. NTS waste acceptance criteria prohibit explosives from being packaged in TRU waste to be stored at NTS. All waste drums were examined using the mobile nondestructive examination RTR system developed by LANL for the presence of compressed gases. All drums to be shipped to WIPP have been found to contain no compressed gases, including unpunctured aerosol cans. (NT 125B/225B) Acceptable knowledge documentation provided by LLNL is used to help ensure that the waste does not contain explosives or compressed gases. The NTS inspects all waste for explosives and compressed gases and segregates any suspect items prior to placement in the payload container.

PYROPHORICS: (NT 125A/225A) Acceptable knowledge documentation provided by LLNL is used to ensure that the waste does not contain pyrophorics. NTS waste acceptance criteria prohibit pyrophorics from being packaged in TRU waste to be stored at NTS. (NT 125B/225B) Acceptable knowledge documentation provided by LLNL is used to ensure that the waste does not contain pyrophorics. The NTS inspects all waste for pyrophorics and segregates any suspect items prior to placement in the payload container.

CORROSIVES: (NT 125A/225A) Acceptable knowledge documentation provided by LLNL is used to ensure that the waste does not contain corrosives. (NT 125B/225B) Acceptable knowledge documentation provided by LLNL is used to help ensure that the waste does not contain corrosives. In addition, all liquids are solidified or absorbed and rendered noncorrosive prior to placement in payload containers.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: (NT 125A/225A) Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC. (NT 125B/225B) Not applicable. Payload containers are fitted with a filter at the time of closure. Open-head drum liners (with no lid) are used.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: OR 125, OR 225 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Mixed Paper, Metal, and Glass

GENERATING SITE: Oak Ridge National Laboratory (ORNL)

WASTE DESCRIPTION: The waste consists of miscellaneous debris from laboratory, maintenance, decontamination, and decommissioning activities. The waste will be processed as part of the TRU/Alpha Low Level Waste Project.

GENERATING SOURCES: The waste was generated across the Oak Ridge site and at other DOE and DOE contractor facilities. The waste will be inspected and repackaged as part of the TRU/Alpha Low Level Waste Project.

WASTE FORM: The waste is debris waste as defined by 40 CFR 268.2(g).

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| OR 125A<br>OR 225A | Waste is packaged directly in a 55-gallon (208-liter) metal drum or an SWB with no layers of confinement (no liner or inner bags). |
| OR 125B<br>OR 225B | Waste is packaged in one inner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB.                                |
| OR 125C<br>OR 225C | Waste is packaged in one filtered liner bag (no inner bags) and then placed in a 55-gallon (208-liter) metal drum or an SWB.       |
| OR 125D<br>OR 225D | Waste is packaged in one inner bag and one filtered liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB.     |
| OR 125E<br>OR 225E | Waste is packaged in two inner bags and one filtered liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB.    |
| OR 125F<br>OR 225F | Waste is packaged in three inner bags and one filtered liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB.  |
| OR 125G<br>OR 225G | Waste is packaged in four inner bags and one filtered liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB.   |
| OR 125H<br>OR 225H | Waste is packaged in five inner bags and one filtered liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB.   |

\* Confinement layers consisting of inner bags are closed only by a twist-and-tape or fold-and-tape method. The liner bags will be heat sealed and equipped with filters. All waste containers are inspected prior to shipment certification and are repackaged as necessary. If drums are overpacked in an SWB or a TDOP, no closed liner bags are used in the overpacking container. Rigid drum liners are not used in 55-gallon drums.

ASSAY: A gamma and PAN assay is performed on waste containers prior to shipment. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error), decay heat (plus error), and isotopic composition as required for generation of the necessary shipping documentation.

FREE LIQUIDS: The waste will be visually examined to ensure that the waste contains <1 volume percent free liquid in the external (payload) container and <1 inch in the bottom of any internal container.

EXPLOSIVES/COMPRESSED GASES: The waste will be visually examined for the presence of explosives, unpunctured aerosol cans, other unvented pressure vessels, or other prohibited items. Prohibited items found in the waste shall be removed and segregated. These materials shall be processed into a WIPP compliant waste form prior to shipment.

PYROPHORICS: The waste will be visually examined for the presence of pyrophorics. Pyrophorics found in the waste shall be removed and segregated from the waste and processed/treated into a WIPP compliant waste form prior to shipment.

CORROSIVES: The waste will be visually examined for the presence of corrosives. Corrosives found in the waste shall be removed and segregated from the waste and processed/treated into a WIPP compliant waste form prior to shipment.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers shall be vented as required by the CH-TRAMPAC at the time of packaging.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RF 111, RF 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Aqueous Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: Aqueous process waste streams are either solidified directly or processed to remove radioactive contamination. Processed waste is in the form of a metal hydroxide sludge. The wet sludge or the aqueous liquid waste is solidified by combining the waste with Portland cement. This waste may also include various particulate, solid inorganic, or other similar waste that may be solidified with a cement and water mixture, or cement may be added to the waste as an absorbent. This waste includes inorganic particulates, sludges, liquids from inorganics, etc. Oxide, oxide heel, peroxide, or hydroxide waste that may have been calcined and/or solidified may be included.

GENERATING SOURCES: The liquid aqueous waste originates from various radioactive (plutonium and uranium) process areas at RFETS. The liquid waste is solidified in Buildings 374 and/or 774. The inorganic particulates, sludges, liquids from inorganics, etc., originate from various RFETS plutonium building areas.

WASTE FORM: Solidified aqueous waste is produced by vacuum filtration of precipitated solids from an aqueous waste slurry. The filter medium is an inert diatomaceous earth medium on a rotating drum. Solids are trapped on the surface of the filter medium as the solution passes through. The surface of the filter medium with entrapped solids is skimmed off as wet sludge. The precipitated solids are chiefly metal hydroxides with a pH of 10 to 12. The final waste form consists of a solidified material produced by combining the liquid aqueous waste or the waste sludge with Portland cement and, in certain cases, with Ramcote insulation cement. Sludge and solidified aqueous wastes may be calcined to form an oxide waste form. Diatomaceous earth (diatomite) may also be added for liquid absorption. The inorganic particulates, sludges, liquid from inorganics, etc., may be mixed with grout, or cement may be added to the waste as absorbent. Oil-Dri may also be added to absorb any free liquid.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| RF 111A<br>RF 211A | <p><u>DRUM PREPARATION:</u> The solidified waste is either prepared in or directly placed into a 55-gallon drum that may be lined with a rigid liner and two plastic liner bags.</p> <p><u>BOX PREPARATION:</u> This packaging configuration consists of one layer of confinement. The SWB may be equipped with one or two plastic liner bags. If two plastic liner bags are used, then one is not sealed closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag(s) for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the prepared SWB.</p> |
| RF 111B<br>RF 211B | <p><u>BOX PREPARATION:</u> The waste is transferred directly into a metal container (e.g. a drum or can) using a plastic sleeve attached externally to the metal container. After waste transfer is complete, the plastic sleeve is closed and a filtered metal lid may then be installed over the closed plastic sleeve and onto the metal container (i.e., the closed, plastic sleeve is situated between the waste material and the metal container lid). The metal containers are then placed into an SWB. A plastic liner bag may be present in the SWB, but if it is present, it is not closed.</p>   |

| Code   | Description*   |
|--|--|
| RF 111D<br>RF 211D<br><br>RF 111DF<br>RF 211DF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.           |
| RF 111E<br>RF 211E                             | The waste is placed directly into a metal can closed with a slip-top lid. The metal can may be double-bagged in vented/filtered plastic bags and may be placed in a larger metal can closed with a slip-top lid. The waste is then placed into a 55-gallon drum that may be lined with a rigid liner and a maximum of two vented/filtered drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.  |
| RF 111H<br>RF 211H                             | <u>DRUM PREPARATION:</u> Waste may be contained in one plastic bag. The waste is then placed into a drum that may be lined with a rigid liner and/or a plastic liner bag.<br><br><u>BOX PREPARATION:</u> The packaging configuration consists of a maximum of two layers of confinement. Waste may be contained in one plastic bag. The waste is then placed into an SWB that may be lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.  |
| RF 111J<br>RF 211J                             | The waste is placed in a metal can with a slip-top or filtered screw-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top or filtered screw-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and one vented/filtered plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 111K<br>RF 211K                             | Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double-bagged in two filtered inner plastic bag layers. Bagged waste may be placed in a filtered rigid plastic, cardboard, or metal container. The outermost rigid container may then be placed in a filtered inner plastic bag, followed by a filtered liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.   |
| RF 111P<br>RF 211P<br><br>RF 111PF<br>RF 211PF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a filtered screw-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |

\*All bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: A sample of the sludge from each drum is taken to determine the amount and identity of the radionuclides (plutonium, americium, and uranium) in the waste. The waste sample is analyzed using a radiochemical assay. The results of the analysis are expressed in terms of grams of each radionuclide present for each gram of waste. Also, the waste may be assayed using a PAN counter or a segmented gamma scan counter, or other approved system. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: The TRU solidified waste is produced through a defined process per approved procedure. Independent visual examination of waste contents at the time of packaging, approved process controls, and/or RTR examination ensures that unacceptable levels of free liquids are not present in the final waste form.

EXPLOSIVES/COMPRESSED GASES: The waste is produced in a closed system which precludes the introduction of extraneous materials such as pressure vessels or explosives. No explosives, explosive mixtures or compressed gases have been identified in this waste. Explosives are prohibited by waste packaging procedures at RFETS.

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, the drum lid contains a minimum of one filter, and the rigid liner is either filtered or punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 112, RF 212 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Organics

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: Waste organic liquids are solidified/processed in various RFETS plutonium areas. The organic liquids may be mixed/combined with gypsum cement (Envirostone), calcium silicate, or other suitable solidification or adsorbing/absorbing material. The waste may also consist of inorganic particulate waste where wetting agents/dust suppressants were applied to minimize the spread of contamination and personnel exposure during waste packaging operations.

GENERATING SOURCE: The waste originates from Building 774 at RFETS or various RFETS plutonium processing/storage areas.

WASTE FORM: The organic liquids or particulates and solidification agents are mixed or combined together within a 55-gallon drum or in small, open top rigid plastic, cardboard, or metal containers. The small containers, or the waste materials removed from the small containers are then placed into a 55-gallon drum. An absorbent such as Nochar Acid Bond or Abzorbit, which may be mixed with a neutralizing agent, loose or on pads, may be placed on top of the waste or between the 55-gallon drum lid and the rigid liner or plastic bags.

The oil/solvent mixtures may contain machining oil, lathe coolant, carbon tetrachloride, 1,1,1-trichloroethane, and 1,1,2-trichloro-1,2,2-trifluoroethane. The organic laboratory waste may also contain chloroform or a mix of chloroform and xylene and other chemicals.

Alternately, the waste is either mixed with grout or cement is added to the waste as an absorbent. Oil-Dri may also be added to the waste as an absorbent without cementation. The cement mixture varies by procedure with the type of waste being cemented.

The waste may also have organic liquids (as constituents in the formulation of dust suppressants/ wetting agents) which were added to inorganic particulate waste to minimize the spread of contamination during waste packaging operations.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code                                       | Description*  |
|--|---|
| RF 112A<br>RF 212A                         | The solidified waste is either prepared in or directly placed into a 55-gallon drum that may be lined with a rigid liner and two plastic liner bags.  |
| RF 112B<br>RF 212B                         | <u>DRUM PREPARATION:</u> The waste is placed directly into a metal can closed with a slip-top lid. The metal can may then be double-bagged in plastic bags. The waste is placed into a 55-gallon drum that may be lined with a rigid liner and a plastic drum liner bag.  |
| RF 112D<br>RF 212D<br>RF 112DF<br>RF 212DF | The waste is placed in a metal can with a slip-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top or filtered screw-top lid. The waste is then placed into a pipe component. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |

| Code                 | Description*   |
|----------------------|--|
| RF 112J<br>RF 212J   | The waste is placed in a metal can with a slip-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top or filtered screw-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and one vented/filtered plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection. |
| RF 112N<br>RF 212N   | <b>DRUM PREPARATION:</b> The waste is either loaded directly into a drum or placed in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and a plastic drum liner bag.   |
| RF 112O<br>RF 212O   | The solidified waste is packaged in a 55-gallon drum that may be lined with a rigid liner and up to two liner bags. All plastic liner bags have been slit with a minimum of one 1-inch diameter hole. High diffusion filters (5X or 25X) may be used in the drum lid.  |
| RF 112OA<br>RF 212OA | The solidified waste is packaged in a 55-gallon drum that may be lined with a rigid liner without a rigid liner lid and up to two liner bags. All plastic liner bags have been slit with a minimum of one 1-inch diameter hole. High diffusion filters (5X or 25X) may be used in the drum lid.  |
| RF 112P<br>RF 212P   | The solidified waste is packaged in a 55-gallon drum that may be lined with a rigid liner and up to two liner bags. All plastic liner bags have been slit with a minimum of one 0.3-inch diameter hole. High diffusion filters (5X or 25X) may be used in the drum lid.  |
| RF 112PA<br>RF 212PA | The solidified waste is packaged in a 55-gallon drum that may be lined with a rigid liner without a rigid liner lid and up to two liner bags. All plastic liner bags have been slit with a minimum of one 0.3-inch diameter hole. High diffusion filters (5X or 25X) may be used in the drum lid.  |
| RF 112Q<br>RF 212Q   | The solidified waste is packaged in a 55-gallon drum that may be lined with a rigid liner and a maximum of one plastic liner bag. High diffusion filters (5X or 25X) may be used in the drum lid.  |
| RF 112QA<br>RF 212QA | The solidified waste is packaged in a 55-gallon drum that may be lined with a rigid liner without a rigid liner lid and a maximum of one plastic liner bag. High diffusion filters (5X or 25X) may be used in the drum lid.  |

\*All bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

**ASSAY:** The laboratory solvents are containerized and assayed prior to shipment to Building 774. The results of the radiochemical assays for bottled waste liquid are totaled and assigned to the appropriate drum. The oil/solvent mixture is transferred to Building 774 via pipeline from waste tanks in other buildings. The contents of each tank are assayed radiochemically to determine the amount of radionuclides in the liquid. The liquids are transferred to Building 774 in batches of less than 200 grams Pu fissile gram equivalent. The assay results for the batch are equally divided among all of the drums of cemented waste produced from that batch. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

Alternately, individual cans/drums of waste may be assayed using SGS counters, calorimetry, or other approved assay system. Can assays are totaled to determine the amounts of radionuclides present per drum. The results are expressed in grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

**FREE LIQUIDS:** The TRU solidified waste is produced through a defined process per approved procedure. Independent visual examination of waste contents at the time of packaging, approved process controls, and/or RTR examination ensures that unacceptable levels of free liquids are not present in the final waste form.



EXPLOSIVES/COMPRESSED GASES: No explosives, explosive mixtures or compressed gases have been identified in this waste. Explosives are prohibited by waste packaging procedures at RFETS.

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type IV.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, the drum lid contains a filter, and the rigid liner is either filtered or punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 113, RF 213 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Laboratory Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: Aqueous laboratory wastes that are not compatible (i.e., strong acids or bases) with the primary aqueous treatment system are neutralized and solidified. The final waste form is obtained by mixing Portland and magnesia cements with the waste.

GENERATING SOURCE: The waste originates from Building 774 at RFETS.

WASTE FORM: The liquid waste is accumulated in bottles and, after chemical and radiochemical assay, is transferred to Building 774. The bottles are segregated into batches of 60-100 liters and less than 200 grams fissile material. The pH of the waste is adjusted to be slightly basic, and then the liquid is added to the premixed (Portland and magnesia) cement mixture in the drum.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| RF 113A<br>RF 213A | The solidified waste is either prepared in or directly placed into a 55-gallon drum that may be lined with a rigid liner and two plastic liner bags. |

\*All bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: As described under waste form, the laboratory waste is assayed radiochemically. The results of the assays are totaled and assigned to the appropriate drum. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: The TRU solidified waste is produced through a defined process per approved procedure. Independent visual examination of waste contents at the time of packaging, approved process controls, and/or RTR examination ensures that unacceptable levels of free liquids are not present in the final waste form.

EXPLOSIVES/COMPRESSED GASES: No explosives, explosive mixtures or compressed gases have been identified in this waste. Explosives are prohibited by waste packaging procedures at RFETS.

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The

chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type IV.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid contains a minimum of one filter, and the rigid liner is either filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RF 114, RF 214 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Cemented Inorganic Process Solids

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: Various particulate and solid inorganic waste generated and containerized during plutonium operations that is either solidified with grout (cement and water mixture) or cement is added to the waste as an absorbent. The waste includes inorganic particulates, sludges, residual heels from aqueous inorganic waste processing, etc. The resultant waste is designated cemented inorganic process solids.

GENERATING SOURCES: The wastes were generated from various RFETS plutonium areas.

WASTE FORM: The waste is either mixed with grout (cement/water mixture) or cement is added to the waste as an absorbent. The grout mixture may vary with the type of waste being cemented.

WASTE PACKAGING: Details of the waste packaging for each code are specified in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code   | Description*   |
|--|--|
| RF 114A<br>RF 214A                             | The solidified waste is placed directly into a single plastic bag. Waste may be placed into another layer of plastic. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and a plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 114B<br>RF 214B                             | The waste is placed in a metal can with a slip-top lid. The metal can is removed from the glovebox line and may be placed in up to two plastic bags. The waste may be placed in a larger metal can with a slip-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and a maximum of two plastic drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 114D<br>RF 214D<br><br>RF 114DF<br>RF 214DF | The waste is placed in a metal can with a slip-top lid. The metal can is removed from the glovebox line and may be placed in up to two plastic bags. The waste may be placed in a larger metal can with a slip-top lid. The waste is then placed in a pipe component. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |
| RF 114E<br>RF 214E                             | The waste is placed in a metal can with a slip-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and a maximum of two vented/filtered plastic drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 114F<br>RF 214F                             | The waste is placed directly into a single plastic bag. Waste may be placed into another layer of plastic. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and a maximum of two plastic drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection. All the rigid liner bags and inner confinement bags are vented/filtered or punctured.  |

| Code   | Description*   |
|--|--|
| RF 114G<br>RF 214G<br><br>RF 114GF<br>RF 214GF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.           |
| RF 114J<br>RF 214J<br><br>RF 114JF<br>RF 214JF | The waste is placed directly into a metal can closed with a slip-top or filtered screw-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top or filtered screw-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and a maximum of two vented/filtered plastic drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 114K<br>RF 214K                             | The solidified waste is either prepared in or directly placed into a 55-gallon drum that may be lined with a rigid liner and two plastic bag liners.   |
| RF 114L<br>RF 214L                             | The solidified waste is either prepared in or directly placed into a 55-gallon drum that may be lined with a rigid liner and two vented/filtered plastic bag liners.   |
| RF 114P<br>RF 214P<br><br>RF 114PF<br>RF 214PF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a filtered screw-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |

\*All liner bag and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: Individual cans/drums of waste may be assayed using SGS counters, calorimetry, or other approved assay system. Can assays are totaled to determine the amounts of radionuclides present per drum. The results are expressed in grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUID: The TRU solidified waste is produced through a defined process per approved procedure. Independent visual examination of waste contents at the time of packaging, approved process controls, and/or RTR examination ensures that unacceptable levels of free liquid are not present in the final waste form.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent visual examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers.

PYROPHORICS: Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophorics will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.3 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is either filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: Maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 115, RF 215 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Graphite Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists of discarded graphite from plutonium casting and laboratory operations.

GENERATING SOURCES: The waste was generated from various plutonium areas at RFETS (primarily from Buildings 371, 374, 559, 707, 771, and 776).

WASTE FORM: The waste consists of broken or unbroken graphite molds and graphite furnace equipment, or graphite chunks and pieces from mold cleaning, scarfing, and declassification. Discarded laboratory equipment composed primarily of graphite is also included in this content code. Some of the waste may be immobilized by mixing with low temperature melting glass.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| RF 115A<br>RF 215A | The waste is placed either directly into a 55-gallon drum, or double-bagged prior to loading into a 55-gallon drum. The drum may be lined with a rigid liner and up to two plastic liner bags. A fiberboard liner insert may be placed between the waste bags and the drum liners for puncture protection.  |
| RF 115B<br>RF 215B | The waste is placed directly into a metal can. The metal can may be double-bagged in plastic bags and removed from the glovebox line. The metal can may also be placed into a larger metal can. The waste is then placed into a 55-gallon drum that may be lined with a rigid liner and a maximum of two drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.  |
| RF 115D<br>RF 215D | The waste is placed directly into a metal can and then placed into a pipe component. The metal cans may be double-bagged in plastic bags and removed from the glovebox line. The bagged material may be placed into a larger metal can. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner and with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place followed by the filtered drum lid. The rigid liner will be filtered or punctured, in accordance with the CH-TRAMPAC. The lid is then secured to the drum with a bolted closure ring. |
| RF 115E<br>RF 215E | The waste is removed from the glovebox line contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a vented/filtered metal container and then placed into a 55-gallon drum that may be lined with a rigid liner and one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.   |

| Code               | Description*  |
|--------------------|---|
| RF 115F<br>RF 215F | The waste is placed inside a 55-gallon drum that may be equipped with a vented rigid liner and one or two filtered plastic liner bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are filtered with a minimum of one filter vent.                            |
| RF 115N<br>RF 215N | <p><u>DRUM PREPARATION</u>: The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.</p> <p><u>BOX PREPARATION</u>: Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. The bag liner is sealed by taping along the folds.</p> |

\* All bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is either filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 116, RF 216 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Combustible Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists of paper, rags, cloth, coveralls, plastic, rubber, wood and other similar items.

GENERATING SOURCES: The waste was generated from various plutonium areas at RFETS (primarily from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779).

WASTE FORM: The waste consists mainly of cloth and paper products from cleanup of gloveboxes and spills. It may also include other combustible items as mentioned in the waste description section. Some of the waste may have been processed to remove excess aqueous solution and/or solvents.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code   | Description*   |
|--|--|
| RF 116A<br>RF 216A                             | <p><u>DRUM PREPARATION:</u> The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and up to two plastic liner bags.</p> <p><u>BOX PREPARATION:</u> This packaging configuration consists of one layer of confinement. The SWB may be equipped with one or two plastic liner bags. If two plastic liner bags are used, then one is not sealed closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag(s) for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the prepared SWB.</p> |
| RF 116C<br>RF 216C                             | The waste is precompacted and placed into 35-gallon drums. The loaded 35-gallon drums are supercompacted into "pucks". The supercompacted waste has all confinement layers (plastic bags) breached. Up to three 35-gallon drum pucks are placed in a maximum of two confining layers of plastic inside a 55-gallon drum. Both layers of plastic are drum liner bags.   |
| RF 116D<br>RF 216D<br><br>RF 116DF<br>RF 216DF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.   |
| RF 116E<br>RF 216E<br><br>RF 116EF<br>RF 216EF | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox line contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a vented/filtered metal container and then placed into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>  |

| Code   | Description*  |
|--|---|
| RF 116F<br>RF 216F                             | <p><u>DRUM PREPARATION:</u> This waste stream is packaged inside a 55-gallon drum that may be lined with a rigid liner and one or two vented/filtered plastic liner bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste stream may be packaged inside an SWB equipped with a vented/filtered plastic liner bag. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the SWB, or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 116G<br>RF 216G<br><br>RF 116GF<br>RF 216GF | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox line contained in one vented/filtered plastic bag. The bagged waste may be placed into a vented/filtered metal container and then into a 55-gallon drum that may be lined with a rigid liner, and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>  |
| RF 116H<br>RF 216H                             | <p>The packaging configuration consists of two layers of confinement. Waste may be contained in one plastic bag. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the inner layer of confinement. The bag liner is sealed by taping along the folds.</p>  |
| RF 116I<br>RF 216I                             | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a metal can closed with a slip-top lid, and then into a 55-gallon drum that may be lined with a rigid liner, and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> The waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>  |
| RF 116J<br>RF 216J                             | <p>Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double bagged in two twist-and-taped inner plastic bag layers. Bagged waste is placed in an unsealed rigid plastic, cardboard, or metal container. The outermost rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.</p>   |
| RF 116K<br>RF 216K<br><br>RF 116KF<br>RF 216KF | <p>Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double bagged in two filtered inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The outermost rigid container is then placed in a filtered inner plastic bag, followed by a filtered liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.</p>   |

| Code                                       | Description*   |
|--|--|
| RF 116L<br>RF 216L                         | Waste is placed directly in three twist-and-taped inner plastic bag layers. Bagged waste is placed in an unsealed rigid plastic, cardboard, or metal container. The rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.  |
| RF 116M<br>RF 216M<br>RF 116MF<br>RF 216MF | Waste is placed directly in three filtered inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The rigid container is then placed in a filtered inner plastic bag, followed by a filtered liner bag. Finally, waste is placed in a 55-gallon drum which may be lined with a rigid drum liner.   |
| RF 116N<br>RF 216N                         | <u>DRUM PREPARATION:</u> The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.<br><br><u>BOX PREPARATION:</u> The packaging configuration consists of three layers of confinement. Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. The bag liner is sealed by taping along the folds. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.   |
| RF 116P<br>RF 216P<br>RF 116PF<br>RF 216PF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a filtered screw-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |
| RF 116Q<br>RF 216Q                         | The waste is packaged inside one or two plastic inner bags and then placed in a 55-gallon drum that may be lined with a rigid liner. Either the drum does not contain any liner bags, or all liner bags have been punctured upon repackaging.  |
| RF 116R<br>RF 216R<br>RF 116RF<br>RF 216RF | Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double bagged in two twist-and-taped inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The outermost rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.  |
| RF 116S<br>RF 216S<br>RF 116SF<br>RF 216SF | Waste is placed directly in three twist-and-taped inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.   |

| Code               | Description*  |
|--------------------|---|
| RF 116T<br>RF 216T | The packaging configuration consists of two vented/filtered layers of confinement. Waste may be contained in one vented/filtered plastic bag. The waste is then placed into an SWB that is lined with one vented/filtered plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The vented/filtered bag liner is sealed by taping along the folds. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in an SWB, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

**ASSAY:** The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

**FREE LIQUIDS:** Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

**EXPLOSIVES/COMPRESSED GASES:** Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

**PYROPHORICS:** No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

**CORROSIVES:** The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

**CHEMICAL COMPATIBILITY:** A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.



PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid contains a minimum of one filter, and the rigid liner is vented/filtered or punctured, if present. Each SWB is fitted with at least two, and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 117, RF 217 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Metal Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists of discarded items or objects of metal (e.g., iron, copper, aluminum, stainless or other steel alloys, tungsten, depleted uranium, lead, and tantalum.)

GENERATING SOURCES: The waste originates from various plutonium areas at RFETS (primarily from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779).

WASTE FORM: The waste form includes items such as gloveboxes, used shielding, tools/tooling, crucibles, machinery, equipment, scrap metal components, empty containers, and other metallic objects. The waste is not finely divided or particulate in form, and so does not possess a pyrophoric characteristic. The items that are difficult to reduce to a size that would fit in a drum are placed in an SWB or TDOP.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| RF 117A<br>RF 217A | <p><u>DRUM PREPARATION:</u> The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and up to two plastic liner bags. A fiberboard liner insert may be placed between the waste and the drum liner for puncture protection.</p> <p><u>BOX PREPARATION:</u> This packaging configuration consists of one layer of confinement. The SWB may be equipped with one or two plastic liner bags. If two plastic liner bags are used, then one is not sealed closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag(s) for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the prepared SWB.</p> <p><u>TDOP PREPARATION:</u> The waste may be packaged in up to two plastic bags and then placed into a TDOP.</p> |
| RF 117B<br>RF 217B | <p>The waste is placed directly into a metal can. The metal can may be double-bagged in plastic bags and removed from the glovebox line. The metal can may also be placed into a larger metal can. The waste is then placed into a 55-gallon drum that may be lined with a rigid liner and a maximum of two drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.</p>   |
| RF 117C<br>RF 217C | <p>The waste is loaded directly into 35-gallon drums. The loaded 35-gallon drums are supercompacted into "pucks". The supercompacted waste has all confinement layers (plastic bags) breached. Up to four 35-gallon pucks are placed into a 55-gallon drum. The waste is packaged with a maximum of two confining layers of plastic, both layers being drum liner bags.</p>   |

| Code               | Description*  |
|--------------------|---|
| RF 117D<br>RF 217D | The waste is placed directly into a metal can and then placed into a pipe component. The metal cans may be double-bagged in plastic bags and removed from the glovebox line. The bagged material may be placed into a larger metal can. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place followed by the filtered drum lid. The rigid liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.   |
| RF 117E<br>RF 217E | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox line contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a vented/filtered metal container and then placed into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>   |
| RF 117F<br>RF 217F | <p><u>DRUM PREPARATION:</u> This waste stream is packaged inside a 55-gallon drum that may be lined with a rigid liner and up to two vented/filtered plastic liner bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste stream may also be packaged inside an SWB equipped with a vented/filtered plastic liner bag. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>   |
| RF 117H<br>RF 217H | The packaging configuration consists of two layers of confinement. Waste may be contained in one plastic bag. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the inner layer of confinement. The bag liner is sealed by taping along the folds.   |
| RF 117I<br>RF 217I | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a metal can closed with a slip-top lid and then into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> The waste may be packaged in up to two vented/filtered plastic bags and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The package configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p> <p><u>TDOP PREPARATION:</u> The waste may be packaged in up to two vented/filtered plastic bags and then placed into a TDOP. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |

| Code               | Description*   |
|--------------------|--|
| RF 117K<br>RF 217K | <u>BOX PREPARATION</u> : The waste may be contained in up to three vented/filtered plastic bags and then placed into an SWB. The SWB may be lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.  |
| RF 117N<br>RF 217N | <u>DRUM PREPARATION</u> : The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.<br><br><u>BOX PREPARATION</u> : The packaging configuration consists of three layers of confinement. Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. The bag liner is sealed by taping along the folds. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. |
| RF 117T<br>RF 217T | The packaging configuration consists of two vented/filtered layers of confinement. Waste may be contained in one vented/filtered plastic bag. The waste is then placed into an SWB that is lined with one vented/filtered plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The vented/filtered bag liner is sealed by taping along the folds. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.  |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in an SWB, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans in to drums or pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Finely divided radionuclide material that may be pyrophoric will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is either filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RF 118, RF 218 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Glass Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists of glass and ceramic waste from recovery, maintenance and laboratory operations.

GENERATING SOURCES: The waste originates from various plutonium areas at RFETS (primarily from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779).

WASTE FORM: The waste form includes items such as Raschig rings (borosilicate glass - neutron poison), ceramic crucibles, glovebox windows, laboratory glassware, process equipment and empty containers.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| RF 118A<br>RF 218A | <p><u>DRUM PREPARATION:</u> The glass is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. In addition, the waste may be collected in a metal can or polyethylene bottle which would then be removed from the line wrapped within the two bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and up to two plastic liner bags. The drums may have a fiberboard liner placed between the waste and the container liners for puncture protection.</p> <p><u>BOX PREPARATION:</u> This packaging configuration consists of one layer of confinement. The SWB may be equipped with one or two plastic liner bags. If two plastic liner bags are used, then one is not sealed closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag(s) for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the prepared SWB.</p> |
| RF 118B<br>RF 218B | The waste is placed directly into a metal can. The metal can may be double-bagged and removed from the glovebox line. The metal can may also be placed into a larger metal can. The waste is then placed into a 55-gallon drum that may be lined with a rigid liner and a maximum of two drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 118C<br>RF 218C | The waste is loaded directly into 35-gallon drums. The loaded 35-gallon drums are supercompacted into "pucks". The supercompacted waste has all confinement layers (plastic bags) breached. Up to four 35-gallon pucks are placed into a 55-gallon drum. The waste is packaged with a maximum of two confining layers of plastic, both layers being drum liner bags.   |

| Code               | Description*   |
|--------------------|--|
| RF 118D<br>RF 218D | The waste is placed directly into a metal can and then placed into a pipe component. The metal cans may be double-bagged in plastic bags and removed from the glovebox line. The bagged material may be placed into a larger metal can. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that may be lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place followed by the filtered drum lid. The rigid liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.  |
| RF 118E<br>RF 218E | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox line contained in up to two vented/filtered plastic bags. In addition, the waste may be collected in a metal can or polyethylene bottle (<math>\leq 4</math> liters), which would then be removed from the line contained within the two vented/filtered plastic bags. The bagged waste may be placed into a vented/filtered metal container and then placed into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>     |
| RF 118F<br>RF 218F | <p><u>DRUM PREPARATION:</u> This waste stream is packaged inside a 55-gallon drum that may be lined with a rigid liner and up to two vented/filtered plastic liner bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste stream may be packaged inside an SWB equipped with a vented/filtered plastic liner bag. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 118H<br>RF 218H | The packaging configuration consists of two layers of confinement. Waste may be contained in one plastic bag. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the inner layer of confinement. The bag liner is sealed by taping along the folds.  |
| RF 118I<br>RF 218I | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a metal can closed with a slip-top lid and then into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> The waste may be packaged in up to two vented/filtered plastic bags and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The package configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>  |



| Code               | Description*  |
|--------------------|---|
| RF 118N<br>RF 218N | <p><u>DRUM PREPARATION</u>: The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.</p> <p><u>BOX PREPARATION</u>: The packaging configuration consists of three layers of confinement. Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The bag liner is sealed by taping along the folds.</p> |
| RF 118T<br>RF 218T | <p>The packaging configuration consists of two vented/filtered layers of confinement. Waste may be contained in one vented/filtered plastic bag. The waste is then placed into an SWB that is lined with one vented/filtered plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The vented/filtered bag liner is sealed by taping along the folds. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>  |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in an SWB, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s) or, in some cases by approved acceptable knowledge data. Assay, when used, is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay/acceptable knowledge results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay/acceptable knowledge results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is either filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RF 119, RF 219 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Filter Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: Filter waste includes absolute dry box filters, HEPA filters, plenum prefilters, and Ful-Flo (for liquids) filters that were used to remove suspended solids in various liquid and air streams at RFETS.

GENERATING SOURCES: The waste originates from various RFETS plutonium areas.

WASTE FORM: HEPA filters and drybox filters are of various sizes. The frames are made of wood or metal, and the media are composed of a fiberglass-type or Nomex-type material. Ful-Flo is a product name. Ful-Flo filters consist of polypropylene plastic, and are one piece, molded, in-line cartridge filters that are used to remove particulates from liquid process streams. Other filters may also be included in this waste type and may be composed of wood or metal, and media composed of a fiberglass-type or Nomex-type material. Some types of filter waste are processed by the addition of cement to the waste, according to Waste Operations procedures.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code   | Description*   |
|--|--|
| RF 119A<br>RF 219A                                 | <p><u>DRUM PREPARATION:</u> The waste is placed directly into a single plastic bag. Waste may be placed into another layer of plastic. The filters may be placed in a "poly bottle" or "Clam Shell" (i.e., hard plastic container), which has been punctured upon repackaging and is then placed in a 55-gallon drum that may be lined with a rigid liner and a maximum of two plastic drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.</p> <p><u>BOX PREPARATION:</u> The waste may also be packaged into an SWB. Each bag of waste is opened/punctured prior to placement in the SWB. The SWB is lined with one plastic liner bag. All liner bags are sealed by taping along the folds.</p> |
| RF 119BA<br>RF 219BA<br><br>RF 119BAF<br>RF 219BAF | The waste is placed directly into a metal can closed with a slip-top lid. The metal can is then double-bagged in plastic bags. Bagged waste may be placed into a larger metal can with a slip-top or a filtered screw-top lid. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid liner and a drum liner bag.   |
| RF 119C<br>RF 219C                                 | The waste is precompacted and placed into 35-gallon drums. The loaded 35-gallon drums are supercompacted into "pucks". The supercompacted waste has all confinement layers (plastic bags) breached. Up to three 35-gallon drum pucks are placed in a maximum of two confining layers of plastic inside a 55-gallon drum. Both layers of plastic are drum liner bags.   |
| RF 119D<br>RF 219D<br><br>RF 119DF<br>RF 219DF     | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.   |

| Code   | Description*  |
|--|---|
| RF 119E<br>RF 219E<br><br>RF 119EF<br>RF 219EF | <p><u>DRUM PREPARATION</u>: The waste is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a metal can with a slip-top or vented/filtered lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.</p> <p><u>BOX PREPARATION</u>: This waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>  |
| RF 119F<br>RF 219F                             | <p><u>DRUM PREPARATION</u>: The waste is packaged inside a 55-gallon drum that may be lined with a rigid liner and up to two vented/filtered plastic liners or O-Ring bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION</u>: This waste stream may be packaged inside an SWB equipped with a vented/filtered plastic liner bag. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the SWB, or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 119G<br>RF 219G<br><br>RF 119GF<br>RF 219GF | <p><u>DRUM PREPARATION</u>: The waste is removed from the glovebox line contained in one vented/filtered plastic bag. The bagged waste may be placed into a vented/filtered metal container and then into a 55-gallon drum that may be lined with a rigid liner and one vented/filtered plastic liner bag.</p> <p><u>BOX PREPARATION</u>: This waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>  |
| RF 119H<br>RF 219H                             | <p>The packaging configuration consists of two layers of confinement. Waste may be contained in one plastic bag. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the inner layer of confinement. The bag liner is sealed by taping along the folds.</p>  |
| RF 119I<br>RF 219I                             | <p><u>DRUM PREPARATION</u>: The waste is removed from the glovebox line in up to two vented/filtered plastic bags. The waste may be placed in a metal can with a slip-top lid and then into a 55-gallon drum that may be lined with a rigid liner and one vented/filtered drum liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION</u>: The waste may be packaged in up to two vented/filtered plastic bags and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The package configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>   |

| Code   | Description*   |
|--|--|
| RF 119J<br>RF 219J                             | Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double bagged in two twist-and-taped inner plastic bag layers. Bagged waste is placed in an unsealed rigid plastic, cardboard, or metal container. The outermost rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid liner.  |
| RF 119K<br>RF 219K<br><br>RF 119KF<br>RF 219KF | Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container may then be double bagged in two filtered inner plastic bag layers. Bagged waste may be placed in a filtered/vented rigid plastic, cardboard, or metal container. The outermost rigid container may then be placed in a filtered/vented inner plastic bag, followed by a filtered/vented liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid liner.   |
| RF 119L<br>RF 219L                             | Waste is placed directly in three twist-and-taped inner plastic bag layers. Bagged waste is placed in an unsealed rigid plastic, cardboard, or metal container. The rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid liner.   |
| RF 119M<br>RF 219M<br><br>RF 119MF<br>RF 219MF | Waste is placed directly in three filtered inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The rigid container is then placed in a filtered inner plastic bag, followed by a filtered liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid liner.   |
| RF 119N<br>RF 219N                             | <u>DRUM PREPARATION:</u> The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.<br><br><u>BOX PREPARATION:</u> The packaging configuration consists of three layers of confinement. Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The bag liner is sealed by taping along the folds.   |
| RF 119P<br>RF 219P<br><br>RF 119PF<br>RF 219PF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a filtered screw-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |
| RF 119Q<br>RF 219Q                             | The waste is packaged inside one or two plastic inner bags and then placed in a 55-gallon drum that may be lined with a rigid liner. Either the drum does not contain any liner bags, or all liner bags have been punctured upon repackaging.  |
| RF 119R<br>RF 219R<br><br>RF 119RF<br>RF 219RF | Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double bagged in two twist-and-taped inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The outermost rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.  |

| Code                                       | Description*  |
|--|---|
| RF 119S<br>RF 219S<br>RF 119SF<br>RF 219SF | Waste is placed directly in three twist-and-taped inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.  |
| RF 119T<br>RF 219T                         | The packaging configuration consists of two vented/filtered layers of confinement. Waste may be contained in one vented/filtered plastic bag. The waste is then placed into an SWB that is lined with one vented/filtered plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The vented/filtered bag liner is sealed by taping along the folds. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. |
| RF 119W<br>RF 219W                         | The waste is contained in up to three filtered/vented inner plastic bags that may be packaged into a filtered/vented drum liner bag inside a 55-gallon drum. The 55-gallon drum may be lined with a rigid liner.  |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in an SWB, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

**ASSAY:** The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

**FREE LIQUIDS:** Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

**EXPLOSIVES/COMPRESSED GASES:** Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

**PYROPHORICS:** Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid contains a minimum of one filter, and the rigid liner is filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 121, RF 221 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Organic Solid Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists primarily of solid organic debris generated from various processes. The waste material includes Benelex and Plexiglas; blacktop, concrete, dirt and sand; composite debris composed of various combinations of solid organic and inorganic materials; resins or ion exchange resins; and miscellaneous organic solids (that may be either debris or non-debris in nature).

GENERATING SOURCES: The waste originates from various plutonium areas at RFETS, (primarily from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779).

WASTE FORM: The waste consists of slabs of Benelex and Plexiglas neutron shielding and composite debris-type waste (primarily from D&D activities) that may vary in organic composition. This content code also encompasses blacktop, concrete, dirt and sand, resins or ion exchange resins, and other types of miscellaneous solid wastes that contain a significant amount of organic material. In some cases, the waste may be immobilized by mixing with low temperature melting glass.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code                                       | Description*   |
|--|--|
| RF 121A<br>RF 221A                         | <p><u>DRUM PREPARATION</u>: The waste is removed from the glovebox contained in up to two layers of plastic. The bagged waste is then placed in a 55-gallon drum that may be lined with a rigid liner and up to two plastic liner bags. The drums may have a fiberboard liner placed between the waste and the container liners for puncture protection. The waste packaging may include up to two metal cans closed with slip-top lids.</p> <p><u>BOX PREPARATION</u>: This packaging configuration consists of one layer of confinement. The SWB may be equipped with one or two plastic liner bags. If two plastic liner bags are used, then one is not sealed closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag(s) for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the prepared SWB.</p> <p><u>TDOP PREPARATION</u>: The waste may be packaged in up to two plastic bags and then placed into a TDOP.</p> |
| RF 121D<br>RF 221D<br>RF 121DF<br>RF 221DF | <p>The waste is placed directly into a metal can closed with a slip-top lid, and then placed into a pipe component. The metal cans may be double-bagged and removed from the glovebox line. The bagged material may be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that may be lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place followed by the filtered drum lid. The rigid liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.</p>  |

| Code   | Description*   |
|--|--|
| RF 121DA<br>RF 221DA<br><br>RF 121DAF<br>RF 221DAF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.   |
| RF 121E<br>RF 221E                                 | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox line contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a vented/filtered metal container and then placed into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>  |
| RF 121F<br>RF 221F                                 | <p><u>DRUM PREPARATION:</u> This waste stream is packaged inside a 55-gallon drum that may be lined with a rigid liner and up to two vented/filtered plastic liner bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste stream may be packaged inside an SWB equipped with a vented/filtered plastic liner bag. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 121H<br>RF 221H                                 | The packaging configuration consists of two layers of confinement. Waste may be contained in one plastic bag. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the inner layer of confinement. The bag liner is sealed by taping along the folds.  |
| RF 121J<br>RF 221J                                 | The waste is placed in a metal can with a slip-top or filtered screw-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top or filtered screw-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and one vented/filtered plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |

| Code               | Description*  |
|--------------------|---|
| RF 121I<br>RF 221I | <p><u>DRUM PREPARATION</u>: The waste is removed from the glovebox contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a metal can closed with a slip-top lid and then into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION</u>: The waste may be packaged in up to two vented/filtered plastic bags and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The package configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p> <p><u>TDOP PREPARATION</u>: The waste may be packaged in up to two vented/filtered plastic bags and then placed into a TDOP. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 121K<br>RF 221K | <p><u>BOX PREPARATION</u>: The waste may be contained in up to three vented/filtered plastic bags and then placed into an SWB. The SWB may be lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>   |
| RF 121N<br>RF 221N | <p><u>DRUM PREPARATION</u>: The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.</p> <p><u>BOX PREPARATION</u>: The packaging configuration consists of three layers of confinement. Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The bag liner is sealed by taping along the folds.</p>   |
| RF 121T<br>RF 221T | <p>The packaging configuration consists of two vented/filtered layers of confinement. Waste may be contained in one vented/filtered plastic bag. The waste is then placed into an SWB that is lined with one vented/filtered plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The vented/filtered bag liner is sealed by taping along the folds. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>  |
| RF 121W<br>RF 221W | <p>The waste is contained in up to three filtered/vented inner plastic bags that may be packaged into a filtered/vented drum liner bag inside a 55-gallon drum. The 55-gallon drum may be lined with a rigid liner.</p>   |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are

expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RF 122, RF 222 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solid Inorganic Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: This waste consists of a variety of noncompressible and noncombustible inorganic solids such as firebrick; clay absorbent; grit; slag; sand; and mixtures of sand, slag, and crucible. The content code also encompasses insulation, fire blankets and miscellaneous oxides.

GENERATING SOURCES: The waste was generated from various RFETS plutonium areas (primarily Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779).

WASTE FORM: The majority of the waste in this content code is waste generated during maintenance/stripout activities (i.e., replacement of firebrick refractory or insulation). The waste includes material such as firebrick; insulation; fire blankets; Oil-Dri (clay absorbent); miscellaneous oxides; grit; sand; slag; and sand, slag, and crucible mixtures that were generated from the recovery of plutonium for weapons production. In some cases, the waste may be immobilized by mixing with low temperature melting glass.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| RF 122A<br>RF 222A | <p><b>DRUM PREPARATION:</b> The waste is removed from the glovebox contained in up to two layers of plastic. The bagged waste is then placed in a 55-gallon drum which may be lined with a rigid liner and up to two plastic liner bags. The drums may have a fiberboard liner placed between the waste and the container liners for puncture protection. All bag closures are by the twist and tape method.</p> <p><b>BOX PREPARATION:</b> This packaging configuration consists of one layer of confinement. The SWB may be equipped with one or two plastic liner bags. If two plastic liner bags are used, then one is not sealed closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag(s) for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the prepared SWB.</p> |
| RF 122B<br>RF 222B | The waste is placed directly into a metal can. The metal can may be double-bagged in plastic bags and may also be placed into a larger metal can. The waste is then placed into a 55-gallon drum which may be lined with a rigid liner and a maximum of two drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 122D<br>RF 222D | The waste is placed directly into a metal can and then placed into a pipe component. The metal can may be double-bagged and may also be placed into a larger metal can. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.   |

| Code               | Description*   |
|--------------------|--|
| RF 122E<br>RF 222E | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox line contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a vented/filtered metal container and then placed into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>  |
| RF 122F<br>RF 222F | <p><u>DRUM PREPARATION:</u> This waste stream is packaged inside a 55-gallon drum that may be lined with a rigid liner and up to two vented/filtered plastic liner bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste stream may be packaged inside an SWB equipped with a vented/filtered plastic liner bag. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 122H<br>RF 222H | <p>The packaging configuration consists of two layers of confinement. Waste may be contained in one plastic bag. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the inner layer of confinement. The bag liner is sealed by taping along the folds.</p>   |
| RF 122I<br>RF 222I | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a metal can closed with a slip-top lid and then into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> The waste may be packaged in up to two vented/filtered plastic bags and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The package configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>  |
| RF 122N<br>RF 222N | <p><u>DRUM PREPARATION:</u> The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.</p> <p><u>BOX PREPARATION:</u> The packaging configuration consists of three layers of confinement. Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The bag liner is sealed by taping along the folds.</p>  |

| Code               | Description*  |
|--------------------|---|
| RF 122T<br>RF 222T | The packaging configuration consists of two vented/filtered layers of confinement. Waste may be contained in one vented/filtered plastic bag. The waste is then placed into an SWB that is lined with one vented/filtered plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The vented/filtered bag liner is sealed by taping along the folds. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and pipe component lid contains a minimum of one filter, and the rigid liner is filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: RF 123, RF 223 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Leaded Rubber

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists of leaded gloves and aprons.

GENERATING SOURCES: The waste was generated from various RFETS plutonium areas (primarily Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779).

WASTE FORM: The waste consists of discarded leaded gloves and aprons comprised of layers of Hypalon rubber and lead-oxide-impregnated neoprene. Leaded rubber that has been exposed to nitric acid is washed to remove any lead nitrate that may have formed.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| RF 123A<br>RF 223A | The waste is removed from the glovebox line wrapped in two bags and placed in a 55-gallon drum that may be lined with a rigid liner and up to two plastic liner bags.   |
| RF 123E<br>RF 223E | The waste is packaged inside a 55-gallon drum that may be lined with a rigid liner and up to two plastic liner bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that there are two layers of bags around the waste.   |
| RF 123F<br>RF 223F | <p><u>DRUM PREPARATION</u>: The waste is packaged inside a 55-gallon drum that may be lined with a rigid liner and up to two vented/filtered plastic liner bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION</u>: This waste may be packaged inside an SWB equipped with a vented/filtered plastic liner bag. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 123I<br>RF 223I | The waste is removed from the glovebox contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a metal can closed with a slip-top lid and then into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.  |

| Code               | Description*  |
|--------------------|---|
| RF 123N<br>RF 223N | <p><u>DRUM PREPARATION:</u> The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.</p> <p><u>BOX PREPARATION:</u> Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. The bag liner is sealed by taping along the folds.</p> |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (e.g., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid contains a minimum of one filter, and the rigid liner is filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 124, RF 224 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Pyrochemical Salt Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists of spent salt from molten salt extraction, electrorefining, direct oxide reduction, or other recovery and/or refining processes. (RF 124E/224E, RF 124F/224F, RF 124G/224G, RF 124H/224H) These salts may contain interstitial moisture or waters-of-hydration.

GENERATING SOURCES: The waste originates from various plutonium areas at RFETS (primarily Buildings 371, 776, and 779).

WASTE FORM: The salt is composed of various combinations of cesium, calcium, magnesium, potassium and sodium salts used in various pyrochemical operations at RFETS. (RF 124E/224E, RF 124F/224F, RF 124G/224G, RF 124H/224H) These salts may have absorbed environmental moisture during extended storage.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| RF 124B<br>RF 224B | The salt is placed in a metal can and either double-bagged out of the glovebox, or placed in a metal can and double-bagged out. The bagged metal can(s) may be placed in a larger metal can, and/or placed directly in a 55-gallon drum that may be lined with a rigid liner and up to two plastic liner bags. A fiberboard insert may be placed between the waste and the drum bags for puncture protection. The plastic bags used for bagging out the waste may be filtered.  |
| RF 124D<br>RF 224D | The salts are either placed directly in the pipe component or prepackaged in a metal can. If prepackaged, the metal can is either double-bagged out or placed into a larger metal can, and then double-bagged out. The bagged out metal can(s) may be placed in a larger metal can, and/or is placed in the pipe component. Once the material is emplaced, the pipe component lid, with filter, is then bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place followed by the filtered drum lid. The rigid liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. The plastic bags used for bagging out the waste may be filtered. |
| RF 124E<br>RF 224E | The salt is placed in a metal can closed with a slip-top lid and either double-bagged out of the glovebox in vented/filtered plastic bags or placed in a larger metal container closed with a slip-top lid and then double-bagged out. The bagged out metal container(s) may be placed in a larger vented/filtered metal container and/or placed directly in a 55-gallon drum that may be lined with a rigid liner and up to two vented/filtered plastic liner bags. A fiberboard insert may be placed between the waste and the drum bags for puncture protection. The plastic bags used for bagging out the waste are vented/filtered.  |

| Code   | Description*  |
|--|---|
| RF 124F<br>RF 224F<br><br>RF 124FF<br>RF 224FF | The salts are either placed directly in the pipe component or prepackaged in a metal can closed with a slip-top lid. If prepackaged, the metal can is either double-bagged out in vented/filtered plastic bags or placed into a larger metal can closed with a slip-top lid and then double-bagged out. The bagged out metal can(s) may be placed in a larger vented/filtered metal container and/or placed in the pipe component. Once the material is emplaced, the pipe component lid, with filter, is then bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place, followed by the filtered drum lid. The rigid liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. The plastic bags used for bagging out the waste are vented/filtered. |
| RF 124G<br>RF 224G<br><br>RF 124GF<br>RF 224GF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.  |
| RF 124H<br>RF 224H<br><br>RF 124HF<br>RF 224HF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.  |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

**ASSAY:** The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

**FREE LIQUIDS:** Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

**EXPLOSIVES/COMPRESSED GASES:** Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or

RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the tables of allowable materials for Waste Material Types II.2 (RF 124B/224B and RF 124D/224D) and II.3 (RF 124E/224E, RF 124F/224F, RF 124G/224G, and RF 124H/224H) in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 126, RF 226 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Organic Process Solids

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: Various particulate, solid organic, and anion and cation exchange resin waste that may be solidified with grout (Portland and/or magnesia cement and water mixture) or cement may be added to the waste as an absorbent. The waste includes organic particulates, sludges, ion exchange resins, etc.

GENERATING SOURCES: These wastes were generated from various RFETS plutonium areas.

WASTE FORM: The waste is either mixed with grout or cement is added to the waste as an absorbent. Oil-Dri may also be added to the waste as an absorbent without cementation. The cement mixture varies by procedure with the type of waste being cemented.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code   | Description*   |
|--|--|
| RF 126A<br>RF 226A                             | The solidified waste is placed directly in up to two plastic bag layers, or the solidified waste is placed directly into a metal can with a slip-top lid and then in up to two plastic bag layers. The bagged waste may be placed in a larger metal can with a slip-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and a plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.  |
| RF 126D<br>RF 226D<br>RF 126DF<br>RF 226DF     | The waste is placed in a metal can with a slip-top lid. The metal can is removed from the glovebox line and may be placed in up to two plastic bags. The waste may be placed in a larger metal can with a slip-top lid. The waste is then placed into a pipe component. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.                 |
| RF 126DA<br>RF 226DA<br>RF 126DAF<br>RF 226DAF | The waste is placed in a metal can with a slip-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top lid. The waste is then placed into a pipe component. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |
| RF 126E<br>RF 226E                             | The waste is placed directly in up to two filtered plastic bag layers, or the waste is placed directly into a metal can with a slip-top lid and then in up to two filtered plastic bag layers. The bagged waste may be placed in a larger metal can with a slip-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and one filtered drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 126J<br>RF 226J                             | The waste is placed in a metal can with a slip-top or filtered screw-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top or filtered screw-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and one vented/filtered plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |

| Code   | Description*   |
|--|--|
| RF 126K<br>RF 226K                             | The solidified waste is prepared in a 55-gallon drum that may be lined with a rigid liner and two plastic liner bags.  |
| RF 126L<br>RF 226L                             | The solidified waste is prepared in a 55-gallon drum that is lined with a rigid liner and two filtered plastic liner bags.   |
| RF 126P<br>RF 226P<br><br>RF 126PF<br>RF 226PF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a filtered screw-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: Individual cans/drums of waste may be assayed using segmented gamma scan counters, calorimetry, or other approved assay system. Each bottle of resin may be assayed prior to cementation with an approved assay method. The assays are totaled to determine the amounts of radionuclides present per drum. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: The TRU solidified waste is produced through a defined process per approved procedure. Independent visual examination of waste contents at the time of packaging, approved process controls, and/or RTR examination ensures that unacceptable levels of free liquids are not present in the final waste form.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities.

The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is either filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 127, RF 227 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Combined Solid Organics, Solid Inorganics and Solidified Inorganics

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists of an inorganic aqueous liquid waste or sludge material collected in and from contaminated process piping, tanks and equipment. The liquid/sludge waste material is solidified with a polymer-based solidifying agent prior to waste packaging.

GENERATING SOURCES: The aqueous liquid/sludge waste originates from various radioactive (plutonium and uranium) process areas at RFETS.

WASTE FORM: The waste form is produced by combining the inorganic aqueous liquid/sludge waste material with a polymer-based solidification agent (e.g., Nochar Acid Bond, WaterWorks Crystals, etc.) at an appropriate ratio to solidify the liquid in the waste material. The final waste form is a solid material that may be rubber-like or sponge-like in texture.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code   | Description*  |
|--|---|
| RF 127A<br>RF 227A                             | <p><u>DRUM PREPARATION:</u> The solidified waste is either prepared in or directly placed into a 55-gallon drum that may be lined with a rigid liner and up to two plastic liner bags.</p> <p><u>BOX PREPARATION:</u> This packaging configuration consists of one layer of confinement. The SWB may be equipped with one or two plastic liners bags. If two plastic liner bags are used, then one is not sealed closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag(s) for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the prepare SWB.</p> |
| RF 127D<br>RF 227D<br><br>RF 127DF<br>RF 227DF | <p>The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.</p>   |
| RF 127E<br>RF 227E                             | <p>The waste is placed directly into a metal can closed with a slip-top lid. The metal can may be double-bagged in vented/filtered plastic bags and may be placed in a larger metal can closed with a slip-top lid. The waste is then placed into a 55-gallon drum that may be lined with a rigid liner and a maximum of two vented/filtered drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.</p>  |

| Code   | Description*  |
|--|---|
| RF 127F<br>RF 227F                             | <p><u>DRUM PREPARATION:</u> The solidified waste is either prepared in or directly placed into a 55-gallon drum that may be lined with a rigid liner and up to two vented/filtered plastic liner bags. The waste does not contain any inner bag layers. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This packaging configuration consists of up to one layer of confinement. The SWB may be equipped with one filtered plastic liner bag. Another plastic liner bag may be present, but it is not closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p> |
| RF 127H<br>RF 227H                             | Waste may be contained in one plastic bag. The waste is then placed into a drum that may be lined with a rigid liner and/or a plastic liner bag.  |
| RF 127J<br>RF 227J                             | The waste is placed in a metal can with a slip-top or filtered screw-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top or filtered screw-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and one vented/filtered plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.  |
| RF 127K<br>RF 227K                             | Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging will not be a sealed container less than or equal to 4 liters in volume.] The rigid container is then double-bagged in two filtered inner plastic bag layers. Bagged waste may be placed in a filtered rigid plastic, cardboard, or metal container. The outermost rigid container may then be placed in a filtered inner plastic bag, followed by a filtered liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.   |
| RF 127N<br>RF 227N                             | <p><u>DRUM PREPARATION:</u> The solidified waste is either prepared in or directly placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.</p> <p><u>BOX PREPARATION:</u> The packaging configuration consists of up to three layers of confinement. Waste may be placed in a vented rigid container and then contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. The liner bag is sealed by taping along the folds. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>  |
| RF 127P<br>RF 227P<br><br>RF 127PF<br>RF 227PF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a filtered screw-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.  |

\*All bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: A representative sample of the liquid/sludge to be solidified may be taken to determine the identity and concentration of the radionuclides (plutonium, americium, and uranium) present. Assay of the representative waste samples is accomplished using radiochemical analysis. The results of the analysis are expressed in terms of concentration (e.g., mass of each radionuclide present per mass of waste material). Also, the waste may be assayed using a PAN counter or a segmented gamma scan counter, or other approved assay system. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: The TRU solidified waste is produced through a defined process per approved procedure. Independent visual examination of waste contents at the time of packaging, approved process controls, and/or RTR examination ensures that unacceptable levels of free liquids are not present in the final waste form.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent visual examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented, pressurized containers.

PYROPHORICS: Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and pipe component lid contains a minimum of one filter, and the rigid liner is either filtered or punctured. Each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RF 130, RF 230 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solid Inorganic with Residual Organic Waste

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: This waste consists of inorganic items mixed with residual organic materials (paper, plastics, etc.) or moisture. Some of the materials may be immobilized by mixing with a low temperature melting glass.

GENERATING SOURCES: The waste was generated from various RFETS plutonium areas.

WASTE FORM: The waste form in this category is comprised of three subpopulations that are primarily inorganic materials containing an average of less than 10% by weight hydrogenous materials (organic based materials [paper, plastic, cellulose, etc.] or moisture). The first subpopulation is generated primarily from the incomplete incineration of combustible materials (ash, soot, etc.). The second subpopulation is normally produced as the residual from the aqueous processing of various materials (heel[s], processed filter media, etc.). The third subpopulation includes inorganic materials that may have absorbed ambient moisture after long-term storage, such as pyrochemical salts or solid fluoride wastes that have not undergone recent thermal treatments. In general, the waste is homogeneous with the radioactivity dispersed throughout the waste. Depending upon site concerns, some of the waste may be immobilized by mixing with low-temperature melting glass to reduce the recoverability of the material. However, due to the low melting point of the glass frit, some residual hydrogenous materials may remain.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| RF 130A<br>RF 230A | <p><u>DRUM PREPARATION</u>: The waste is placed directly into a single plastic bag. Waste may be placed into another layer of plastic. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and a maximum of two drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.</p> <p><u>BOX PREPARATION</u>: This packaging configuration consists of one layer of confinement. The SWB may be equipped with one or two plastic liner bags. If two plastic liner bags are used, then one is not sealed closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag(s) for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the prepared SWB.</p> <p><u>TDOP PREPARATION</u>: The waste may be packaged in up to two plastic bags and then placed into a TDOP.</p> |
| RF 130B<br>RF 230B | <p>The waste is placed directly into a metal can closed with a slip-top lid. The metal can may be double-bagged in plastic bags and may also be placed into a larger metal can closed with a slip-top lid. The waste is then placed into a 55-gallon drum that may be lined with a rigid liner and a maximum of two drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.</p>   |

| Code   | Description*   |
|--|--|
| RF 130BA<br>RF 230BA                           | The waste is placed directly into a metal can closed with a slip-top lid. The metal can is then double-bagged in two inner plastic bag layers. Bagged waste may be placed in a larger filtered or slip-top metal can. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid liner and a liner bag.   |
| RF 130D<br>RF 230D<br><br>RF 130DF<br>RF 230DF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.  |
| RF 130E<br>RF 230E                             | The waste is placed directly into a metal can closed with a slip-top lid. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. The waste is then placed into a 55-gallon drum that may be lined with a rigid liner and a maximum of two vented/filtered drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 130F<br>RF 230F                             | <p><b>DRUM PREPARATION:</b> The waste is placed directly into a single vented/filtered plastic bag. Waste may be placed into another vented/filtered layer of plastic. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and a maximum of two vented/filtered drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection. All the drum liner bags and inner confinement bags are vented/filtered or punctured.</p> <p><b>BOX PREPARATION:</b> This waste stream may be packaged inside an SWB equipped with a vented/filtered plastic liner bag. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 130G<br>RF 230G<br><br>RF 130GF<br>RF 230GF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.  |
| RF 130H<br>RF 230H                             | The packaging configuration consists of two layers of confinement. Waste may be contained in one plastic bag. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the inner layer of confinement. The bag liner is sealed by taping along the folds.  |

| Code   | Description*  |
|--|---|
| RF 130I<br>RF 230I                             | <p><u>DRUM PREPARATION</u>: The waste is removed from the glovebox contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a metal can closed with a slip-top lid and then into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION</u>: The waste may be packaged in up to two vented/filtered plastic bags and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The package configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p> <p><u>TDOP PREPARATION</u>: The waste may be packaged in up to two vented/filtered plastic bags and then placed into a TDOP. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 130J<br>RF 230J                             | <p>The waste is placed in a metal can with a slip-top or filtered screw-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top or filtered screw-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and one vented/filtered plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.</p>   |
| RF 130K<br>RF 230K                             | <p><u>DRUM PREPARATION</u>: The waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double-bagged in two inner plastic bag layers. Bagged waste may be placed in a filtered rigid plastic, cardboard, or metal container. The outermost rigid container may then be placed in an inner plastic bag, followed by a liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid liner.</p> <p><u>BOX PREPARATION</u>: The waste may be contained in up to three vented/filtered plastic bags and then placed into an SWB. The SWB may be lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>                             |
| RF 130N<br>RF 230N                             | <p>The packaging configuration consists of three layers of confinement. Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The bag liner is sealed by taping along the folds.</p>  |
| RF 130P<br>RF 230P<br><br>RF 130PF<br>RF 230PF | <p>The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a filtered screw-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.</p>   |

| Code   | Description*   |
|--|--|
| RF 130PA<br>RF 230PA<br>RF 130PAF<br>RF 230PAF | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in plastic bags and may then be placed into a larger metal can closed with a filtered screw-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner lid is filtered or punctured. The drum lid is then secured to the drum with a bolted closure ring. |
| RF 130Q<br>RF 230Q                             | Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double bagged in two twist-and-taped inner plastic bag layers. Bagged waste is placed in an unsealed rigid plastic, cardboard, or metal container. The outermost rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.   |
| RF 130R<br>RF 230R<br>RF 130RF<br>RF 230RF     | Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double bagged in two filtered inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The outermost rigid container is then placed in a filtered inner plastic bag, followed by a filtered liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.   |
| RF 130S<br>RF 230S<br>RF 130SF<br>RF 230SF     | Waste is placed directly in three twist-and-taped inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.   |
| RF 130T<br>RF 230T                             | The packaging configuration consists of two vented/filtered layers of confinement. Waste may be contained in one vented/filtered plastic bag. The waste is then placed into an SWB that is lined with one vented/filtered plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The vented/filtered bag liner is sealed by taping along the folds. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.  |
| RF 130U<br>RF 230U                             | Waste is placed directly in three twist-and-taped inner plastic bag layers. Bagged waste is placed in an unsealed rigid plastic, cardboard, or metal container. The rigid container is then placed in a twist-and-taped inner plastic bag, followed by a twist-and-taped liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner.  |
| RF 130V<br>RF 230V<br>RF 130VF<br>RF 230VF     | Waste is placed directly in three filtered inner plastic bag layers. Bagged waste is placed in a filtered rigid plastic, cardboard, or metal container. The rigid container is then placed in a filtered inner plastic bag, followed by a filtered liner bag. Finally, waste is placed in a 55-gallon drum which may be lined with a rigid drum liner.   |
| RF 130W<br>RF 230W                             | The waste is contained in up to three filtered/vented inner plastic bags that may be packaged into a filtered/vented drum liner bag inside a 55-gallon drum. The 55-gallon drum may be lined with a rigid liner.   |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in SWBs, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example supercompacted waste or packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types III.2 and III.3 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RF 131, RF 231 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solid Inorganic Waste (Greater Than Trace Quantities of Beryllium)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: The waste consists of discarded items or objects of metal (e.g., iron, copper, aluminum, beryllium chips, stainless or other steel alloys, tungsten, depleted uranium, lead, and tantalum) that contain beryllium at levels greater than 1 weight percent.

GENERATING SOURCES: The waste originates from various plutonium areas at RFETS (primarily from Buildings 371, 374, 559, 707, 771, 774, 776, 777, and 779).

WASTE FORM: The waste form includes items such as gloveboxes, used shielding, tools/tooling, crucibles, machinery, equipment, scrap metal components, empty containers, and other metallic objects. The waste is not finely divided or particulate in form, and so does not possess a pyrophoric characteristic. The items that are difficult to reduce to a size that would fit in a drum are placed in an SWB or TDOP.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| RF 131A<br>RF 231A | <p><u>DRUM PREPARATION:</u> The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and up to two plastic liner bags. A fiberboard liner insert may be placed between the waste and the drum liner for puncture protection.</p> <p><u>BOX PREPARATION:</u> This packaging configuration consists of one layer of confinement. The SWB may be equipped with one or two plastic liner bags. If two plastic liner bags are used, then one is not sealed closed. A liner (made of metal or wood) may be inserted between the waste and the inner plastic liner to support the plastic liner during loading. A fiberboard liner insert may be placed between the waste and the liner bag(s) for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the prepared SWB.</p> |
| RF 131B<br>RF 231B | <p>The waste is placed directly into a metal can. The metal can may be double-bagged in plastic bags and removed from the glovebox line. The metal can may also be placed into a larger metal can. The waste is then placed into a 55-gallon drum that may be lined with a rigid liner and a maximum of two drum liner bags. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.</p>  |
| RF 131D<br>RF 231D | <p>The waste is placed directly into a metal can and then placed into a pipe component. The metal cans may be double-bagged in plastic bags and removed from the glovebox line. The bagged material may be placed into a larger metal can. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place followed by the filtered drum lid. The rigid liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.</p>   |

| Code               | Description*  |
|--------------------|---|
| RF 131E<br>RF 231E | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox line contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a vented/filtered metal container and then placed into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste may be packaged as described above and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p>   |
| RF 131F<br>RF 231F | <p><u>DRUM PREPARATION:</u> This waste stream is packaged inside a 55-gallon drum that may be lined with a rigid liner and up to two vented/filtered plastic liner bags. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> This waste stream may also be packaged inside an SWB equipped with a vented/filtered plastic liner bag. The waste does not contain any inner layers of confinement (i.e., waste items are either not double-bagged prior to emplacement in the drum or these bags have been punctured upon repackaging). The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> |
| RF 131H<br>RF 231H | <p>The packaging configuration consists of two layers of confinement. Waste may be contained in one plastic bag. The waste is then placed into an SWB that is lined with one plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. Waste items may be wrapped in unsealed plastic prior to placement in the inner layer of confinement. The bag liner is sealed by taping along the folds.</p>  |
| RF 131I<br>RF 231I | <p><u>DRUM PREPARATION:</u> The waste is removed from the glovebox contained in up to two vented/filtered plastic bags. The bagged waste may be placed into a metal can closed with a slip-top lid and then into a 55-gallon drum that may be lined with a rigid liner and a vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent.</p> <p><u>BOX PREPARATION:</u> The waste may be packaged in up to two vented/filtered plastic bags and then placed in an SWB. The SWB is lined with one vented/filtered plastic liner bag. The package configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>   |
| RF 131K<br>RF 231K | <p><u>BOX PREPARATION:</u> The waste may be contained in up to three vented/filtered plastic bags and then placed into an SWB. The SWB may be lined with one vented/filtered plastic liner bag. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>   |
| RF 131N<br>RF 231N | <p><u>DRUM PREPARATION:</u> The waste is either loaded directly into a drum or removed from the glovebox line contained in up to two plastic bags. The bagged waste is then placed into a 55-gallon drum that may be lined with a rigid liner and one plastic liner bag.</p> <p><u>BOX PREPARATION:</u> The packaging configuration consists of three layers of confinement. Waste may be contained in up to two plastic bags. The waste is then placed into an SWB that is lined with one plastic liner bag. The bag liner is sealed by taping along the folds. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection.</p>   |



| Code               | Description*  |
|--------------------|---|
| RF 131T<br>RF 231T | The packaging configuration consists of two vented/filtered layers of confinement. Waste may be contained in one vented/filtered plastic bag. The waste is then placed into an SWB that is lined with one vented/filtered plastic liner bag. A fiberboard liner insert may be placed between the waste and the liner bag for puncture protection. The vented/filtered bag liner is sealed by taping along the folds. The packaging configuration is such that all layers of bags around the waste are vented with a minimum of one filter vent. |

\* All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in an SWB, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag, or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. The waste packaging procedure also instructs that absorbents (i.e., Oil-Dri) be packed with moist or damp waste to absorb any liquids that may desorb after the package is closed. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example supercompacted waste or packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to supercompaction or prior to packaging of cans into drums or pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Finely divided radionuclide material that may be pyrophoric will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is either filtered or punctured, if present. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RF 132, RF 232 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Aqueous Waste/Sludge Waste (Greater Than One Weight Percent Beryllium)

GENERATING SITE: Rocky Flats Environmental Technology Site (RFETS)

WASTE DESCRIPTION: Aqueous process waste streams are either solidified directly or processed to remove radioactive contamination. Processed waste is in the form of a metal hydroxide sludge. The wet sludge or the aqueous liquid waste is solidified by combining the waste with Portland cement. This waste may also include various particulate, solid inorganic, or other similar waste that may be solidified with a cement and water mixture, or cement may be added to the waste as an absorbent. This waste includes inorganic particulates, sludges, liquids from inorganics, etc. Oxide, oxide heel, peroxide, or hydroxide waste that may have been calcined and/or solidified may be included. The waste may contain beryllium at levels greater than one weight percent.

GENERATING SOURCES: The liquid aqueous waste originates from various radioactive (plutonium and uranium) process areas at RFETS.

WASTE FORM: Solidified aqueous waste is produced by vacuum filtration of precipitated solids from an aqueous waste slurry. The filter medium is an inert diatomaceous earth medium on a rotating drum. Solids are trapped on the surface of the filter medium as the solution passes through. The surface of the filter medium with entrapped solids is skimmed off as wet sludge. The precipitated solids are chiefly metal hydroxides with a pH of 10 to 12. The final waste form consists of a solidified material produced by combining the liquid aqueous waste or the waste sludge with Portland cement and, in certain cases, with Ramcote insulation cement. Sludge and solidified aqueous waste may be calcined to form an oxide waste form. Diatomaceous earth (diatomite) may also be added for liquid absorption. The inorganic particulates, sludges, liquid from inorganics, etc., may be mixed with grout, or cement may be added to the waste as absorbent. Oil-Dri may also be added to absorb any free liquid.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| RF 132A<br>RF 232A | The solidified waste is packaged into a 55-gallon drum that may be lined with a rigid liner and two plastic liner bags.   |
| RF 132D<br>RF 232D | The waste is placed directly into a metal can closed with a slip-top lid and then placed into a pipe component. The metal can may be double-bagged in vented/filtered plastic bags and may also be placed into a larger metal can closed with a slip-top lid. Once the material is emplaced, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum that is lined with a rigid liner, with celotex packaging material placed between the pipe component and the rigid liner. The rigid liner lid is then put in place followed by the filtered drum lid. The rigid liner will be punctured. The lid is then secured to the drum with a bolted closure ring. |

| Code                 | Description*   |
|----------------------|--|
| RF 132J<br>RF 232J   | The waste is placed in a metal can with a slip-top or filtered screw-top lid. The metal can is removed from the glovebox line and may be placed in up to two vented/filtered plastic bags. The waste may be placed in a larger metal can with a slip-top or filtered screw-top lid. The waste is then placed in a 55-gallon drum that may be lined with a rigid liner and one vented/filtered plastic drum liner bag. A fiberboard liner insert may be placed between the waste and the drum bags for puncture protection.   |
| RF 132K<br>RF 232K   | Waste is placed directly in a rigid plastic, cardboard, or metal container less than 4 liters in size. [Note: For newly packaged waste, the first layer of packaging is a metal container that will allow free release of hydrogen (e.g., a slip-lid metal container).] The rigid container is then double-bagged in two filtered inner plastic bag layers. Bagged waste may be placed in a filtered rigid plastic, cardboard, or metal container. The outermost rigid container may then be placed in a filtered inner plastic bag, followed by a filtered liner bag. Finally, waste is placed in a 55-gallon drum that may be lined with a rigid drum liner. |
| RF 132P<br>RF 232P   | The solidified waste is packaged in a 55-gallon drum that may be lined with a rigid liner and a maximum of two plastic liner bags. All plastic liner bags have been punctured with a minimum of one 0.3-inch diameter hole.  |
| RF 132Q<br>RF 232Q   | The solidified waste is packaged in a 55-gallon drum that may be lined with a rigid liner and a maximum of one plastic liner bag.  |
| RF 132QA<br>RF 232QA | The solidified waste is packaged in a 55-gallon drum that may be lined with a rigid liner without a rigid liner lid and a maximum of one plastic liner bag.  |

\*All liner bags and bag closures are in accordance with the CH-TRAMPAC. If drums are overpacked in an SWB, no closed liner bags are used in the SWB. For waste packaged in drums, celotex packaging material and fiberboard may be placed between the rigid liner and the liner bag or between the waste (including any metal can or container) and drum bags for puncture protection or for any other site requirement or need. In some cases, a slip-top lid shielding can may be used for ALARA purposes only, with no impact on hydrogen gas release resistance.

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. The waste is produced through a defined process per approved procedure. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to packaging of cans into drums or pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures at RFETS. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. In most cases, for example, bulk loaded drums of solidified waste are produced in a closed system which precludes the introduction of extraneous materials such as pressure vessels or explosives. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized

containers. In certain cases, for example packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to packaging of cans into drums or pipe overpacks).

**PYROPHORICS:** No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Finely divided radionuclide material that may be pyrophoric will be limited to less than 1% by weight of the waste payload in each payload container.

**CORROSIVES:** The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

**CHEMICAL COMPATIBILITY:** A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.2 in the CH-TRAMPAC.

**PAYLOAD CONTAINER VENTING AND ASPIRATION:** Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

**ADDITIONAL CRITERIA:** In accordance with the CH-TRAMPAC, the drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is punctured, if present. Each SWB is fitted with at least two and up to four filters.

**SHIPPING CATEGORY:** See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

**MAXIMUM ALLOWABLE WATTAGE:** The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RH 111, RH 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Aqueous Waste, Solidified Inorganic Process Solids, and Solidified Sand, Slag, and Crucible (SS&C) Residues

GENERATING SITE: Richland Hanford

WASTE DESCRIPTION: (RH 111A/211A) The waste consists of pulverized SS&C pieces.

(RH 111B/211B and RH 111D/211D) The waste consists of sludge from the 105 F Fuel Storage Basin filled with pieces of material from fuel storage basin operations.

GENERATING SOURCES: (RH 111A/211A) The Plutonium Finishing Plant (PFP) generates SS&C pieces from operations in the Remote Mechanical C Line. The plutonium powder is reduced by adding calcium metal and iodine crystals and then firing the charge in a crucible.

(RH 111B/211B and RH 111D/211D) Sludge waste from the 105 F Fuel Storage Basin is generated from decontamination and decommissioning of wastes during remediation.

WASTE FORM: (RH 111A/211A) The as-generated SS&C residue consists of pulverized pieces in metal cans. The residue may also contain small amounts of calcium metal, calcium oxide, plutonium, and plutonium oxide. The mixture may also contain small amounts of glass and brush bristles from the packaging and glove box cleanup operations.

(RH 111B/211B and RH 111D/211D) The sludge waste consists of homogeneous solid inorganic materials with unbound absorbed ambient moisture. This waste was stored in pools and contains particulate matter, sand, and pieces from fuel storage basin operations.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| RH 111A<br>RH 211A | Waste is placed in a slip lid metal can that is then bagged out in up to two filtered inner plastic bags. Bagged out waste is then placed in a pipe component. Once the material is in place, the pipe component lid, with filter, is bolted on. The pipe component is contained in a 55-gallon drum, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |
| RH 111B<br>RH 211B | Waste is placed directly into a 55-gallon drum with no layers of confinement.  |
| RH 111D<br>RH 211D | Waste is placed in an SWB with one plastic liner bag.  |

ASSAY: (RH 111A/211A) An independent assay using the Segmented Gamma Scan Assay System (SGSAS) is performed at PFP on all waste containers certified at Hanford for shipment. The SGSAS is designed to accurately quantify gamma-emitting nuclides and is configured to assay plutonium waste as a part of the characterization requirements. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

(RH 111B/211B and RH 111D/211D) The assay data for each of the containers will be derived from ISOCS, URSA, and approved calculations determined by dividing the radionuclide inventory by the fill volume of the container to be homogenized.

FREE LIQUIDS: Liquid waste, except for residual amounts in well-drained containers, is prohibited in the drums. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging procedures ensure that free liquids are less than 1 volume percent of the payload container.

(RH 111A/211A) The containers will be visually examined at the time of packaging to ensure that no free liquids are present.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging procedures. If present, pressurized cans shall be punctured and emptied prior to packaging.

(RH 111A/211A) The residue material is a granular material that has been processed through a hammer mill; therefore, no containers of compressed gas are present.

PYROPHORICS: (RH 111A/211A) No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures. Radionuclide material will be limited to less than 1% by weight of the waste in each payload container.

(RH 111B/211B and RH 111D/211D) Process knowledge indicates that no non-radioactive pyrophoric material was generated in association with the waste. Waste packaging procedures shall ensure that all radioactive pyrophoric materials are present only in small residual amounts (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload container. Acids and bases that are potentially corrosive shall be neutralized or rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: A 100% visual inspection of the material is performed and recorded at the time of the packaging.



In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter and the rigid drum liner is punctured (if present). The drums are weighed individually and documented. This ensures compliance to weight limits. The TRU waste at the PFP is generated in areas where fission products have been eliminated through a chemical process.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RH 112, RH 212 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Organics

GENERATING SITE: Richland Hanford

WASTE DESCRIPTION: The waste consists of absorbed organics from plutonium processing, recovery processing, and analytical/chemical technology laboratories.

GENERATING SOURCES: The Plutonium Finishing Plant (PFP) generates liquid organics from operations in the Plutonium Reclamation Facility, Plutonium Conversion - Remote Mechanical C Line, and Analytical/Chemical Laboratories.

WASTE FORM: The PFP generates sludges and liquid organics that cannot be readily absorbed back into the process system. These liquid organics are in an unusable form. The material may contain any or all of the following in a compatible configuration: carbon tetrachloride, tributyl phosphate, xylene, iron, nickel, chromium, normal paraffin hydrocarbons, trimethylbenzene, and trioctyl phosphine oxide. This organic liquid mixture is processed via approved procedures before being discarded as waste.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description   |
|--------------------|---|
| RH 112A<br>RH 212A | <p>The liquid organics are absorbed in an inert material sufficient to absorb twice the amount of liquid. The absorbed organic is placed into a 1-gallon plastic or vinyl-coated glass jar. Each 1-gallon jar is double bagged in plastic bags.</p> <p>The drums used for the absorbed organics are 55-gallon drums that may be lined with an optional rigid polyethylene liner. A maximum of sixteen 1-gallon plastic or vinyl-coated glass jars is placed in the drum. Absorbent material may be added to the plastic liner surrounding the 1-gallon jars. All bag closures are by the twist and tape method.</p> |
| RH 112B<br>RH 212B | <p>The liquid organics are absorbed in an inert material sufficient to absorb twice the amount of liquid. The absorbed organic is placed into a 1-gallon plastic or vinyl-coated glass jar. Each 1-gallon jar is double bagged in filtered plastic bags.</p> <p>The drums used for the absorbed organics are 55-gallon drums that may be lined with an optional rigid polyethylene liner. A maximum of sixteen 1-gallon plastic or vinyl-coated glass jars is placed in the drum. Absorbent material may be added to the plastic liner surrounding the 1-gallon jars.</p>   |

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times error) and decay heat (plus error).

FREE LIQUIDS: The liquid organics are packaged in such a manner that free liquids do not present a problem. All CH-TRU waste drums generated at PFP are examined on an RTR unit. This verifies that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited at PFP. The only compressed gas container at PFP that has a potential for entering the waste is an aerosol can. These containers are not allowed in gloveboxes. Aerosol cans are segregated and placed in containers that will not be shipped to WIPP.

PYROPHORICS: Pyrophoric materials do not have a potential for being placed into the waste.

CORROSIVES: Corrosives are excluded from this content code by process controls.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type IV.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: The 100% overview with an assay and RTR assures that the waste and packaging meet the required acceptance criteria. In special cases of high density material, the RTR can be waived provided an independent visual inspection of the waste is performed prior to the final closure of the container. In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. The drums are weighed individually and documented. This insures compliance to weight limits. The TRU waste at PFP is generated in areas where fission products have been eliminated through a chemical process.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RH 114, RH 214 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Inorganic Process Solids and Solidified SS&C Residues

GENERATING SITE: Richland Hanford

WASTE DESCRIPTION: (RH 114A/214A, RH 114B/214B) The waste consists of particulate sludges from plutonium processing, recovery processing, and analytical/chemical technology laboratories. (RH 114C/214C) The waste consists of pulverized sand, slag, and crucible (SS&C) pieces. (RH 114D/214D) The waste consists of cans of the above waste forms that were overfilled or that failed and were subsequently overpacked, or of various components of the processing equipment contaminated with the cemented particulate sludge.

GENERATING SOURCES: (RH 114A/214A, RH 114B/214B, RH 114D/214D) The Plutonium Finishing Plant (PFP) generates particulate sludges from operations and cleanup of process areas in the Plutonium Reclamation Facility, Plutonium Conversion - Remote Mechanical C Line, and Analytical/Chemical Laboratory. (RH 114C/214C, RH 114D/214D) The PFP generates SS&C pieces from operations in the Remote Mechanical C Line. The plutonium powder is reduced by adding calcium metal and iodine crystals and then firing the charge in a crucible.

WASTE FORM: (RH 114A/214A, RH 114B/214B, RH 114D/214D) The PFP generates particulate sludges that cannot be readily absorbed back into the process system. These sludges are scraped/taken out of hoods or trays in an unusable form. The material may contain any or all of the following in a compatible configuration: plutonium oxide, plutonium oxalate, nitric acid, and traces of metal ions (e.g., iron, nickel, and chromium). This mud-like material is processed via approved procedures before being discarded as waste. (RH 114C/214C, RH 114D/214D) The as-generated SS&C residue consists of pulverized SS&C pieces sealed in untinned cans. The residue may also contain small amounts of calcium metal, calcium oxide, plutonium, and plutonium oxide. The residue mixture is reacted by mixing with water and then combining with Portland cement. The mixture may also contain small amounts of glass and brush bristles from the packaging and glovebox cleanup operations. (RH 114D/214D) The cans from RH 114B/214B and/or RH 114C/214C may overflow or fail during curing. Waste may also consist of mixing and associated equipment contaminated with the dried cemented particulate sludge.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| RH 114A<br>RH 214A | The waste drums for the particulate sludges are UN1A2 55-gallon drums lined with a polyethylene plastic liner bag (minimum 4-mil). The drum may also be lined with an optional rigid liner. Absorbent may be added to the bottom of the drum liner. The PFP neutralizes the sludge with Portland cement. The sludge is mixed with cement in unsealed 0.5-liter plastic jars. The waste is bagged out into a standard inner bagout bag and then placed in a plastic inner protective bag before it is placed in the drum. Bag closures are by the twist-and-tape method. |

| Code               | Description*   |
|--------------------|--|
| RH 114B<br>RH 214B | The waste drums for the particulate sludges are UN1A2 55-gallon drums lined with a filtered polyethylene plastic liner bag (minimum 4-mil). The drum may also be lined with an optional rigid liner. Absorbent may be added to the bottom of the drum liner. The cementation may be in a process container, and the mixture transferred to unsealed metal cans. The mixture is allowed to solidify before it is placed into the waste drum. The waste is bagged out into a filtered inner bagout bag and then placed in a filtered inner protective bag before it is placed in the drum. Filtered bags may be heat sealed. |
| RH 114C<br>RH 214C | A measured amount of SS&C is mixed with water in a mixer reactor to react residual calcium metal. The slurry is combined with Portland cement. The cemented slurry is placed in a slip-lid can (nominally 7 inches high by 5.5 inches in diameter) and allowed to harden. The closed metal can is placed in a filtered inner bagout bag and then placed in a filtered inner protective bag before it is placed into a UN1A2 55-gallon drum, which may be lined with an optional rigid liner. Filtered bags may be heat sealed.   |
| RH 114D<br>RH 214D | The overfilled or failed cans and various components of the cementation process equipment (such as the mixer and associated equipment) may be placed in a vented or unsealed can/bucket. The waste is then bagged out in a filtered inner bagout bag and then placed in a filtered inner protective bag before it is placed in a drum, which may be lined with an optional rigid liner. Filtered bags may be heat sealed.  |

\* If drums are overpacked in an SWB, no closed liner bags are used in the SWB.

**ASSAY:** The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times error) and decay heat (plus error).

**FREE LIQUIDS:** (RH 114A/214A, RH 114B/214B, RH 114D/214D) The particulate sludges are packaged in such a manner that free liquids do not present a problem. All CH-TRU waste drums generated at the PFP are examined on a RTR unit. This verifies that free liquids are not present. (RH 114C/214C, RH 114D/214D) The combining of the SS&C mixture with Portland cement sorbs all of the free liquid (water). The cured cement residue mixture in the cans is visually inspected for free liquids before the can is closed.

**EXPLOSIVES/COMPRESSED GASES:** (RH 114A/214A, RH 114B/214B, RH 114D/214D) Explosives are prohibited at the PFP. The only compressed gas container at the PFP that has a potential for entering the waste is an aerosol can. These containers are not allowed in gloveboxes. Aerosol cans are segregated and placed in containers that will not be shipped to WIPP. (RH 114C/214C, RH 114D/214D) The residue material is a granular material that has been processed through a hammer mill; therefore, no containers of compressed gas are present.

**PYROPHORICS:** (RH 114A/214A, RH 114B/214B, RH 114D/214D) Acid-soaked rags (<1 weight percent of the waste) are rinsed in a solution of sodium hydroxide. The rags are allowed to dry before being placed into the waste. Plutonium metal at the facility is controlled by criticality limits. This precludes the possibility of significant amounts of metal being placed into the waste. Laboratory materials that are pyrophoric are limited in the quantity allowed in the facility. These materials are used in non-radioactive areas and are discarded as non-radioactive waste. All waste meets the restrictions on pyrophoric materials in the CH-

TRAMPAC. (RH 114C/214C, RH 114D/214D) Plutonium metal in the residues is stabilized in Portland cement, and the plutonium concentration meets the restrictions on pyrophoric materials in the CH-TRAMPAC.

CORROSIVES: There are no corrosives in this content code.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.3 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: (RH 114A/214A, RH 114B/214B, RH 114D/214D) The 100% overview with an assay and RTR assures that the waste and packaging meet the required acceptance criteria. In special cases of high density material, the RTR can be waived provided an independent visual inspection of the waste is performed prior to the final closure of the container. (RH 114C/214C, RH 114D/214D) A 100% visual inspection of the material is performed and recorded at the time of the packaging.

In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter and the rigid drum liner is punctured (if present). Each SWB is fitted with at least two and up to four filters. The drums are weighed individually and documented. This ensures compliance to weight limits. The TRU waste at the PFP is generated in areas where fission products have been eliminated through a chemical process.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: RH 117, RH 217 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Metal Waste

GENERATING SITE: Richland Hanford

WASTE DESCRIPTION: The waste consists of Mark IV/V PR cans, Emergency PR cans, and other inorganic items including plutonium alloy scrap (Group I).

GENERATING SOURCES: The Plutonium-Uranium Reduction Extraction Facility (PUREX) generated liquid plutonium nitrate solutions. These solutions are stored at the Plutonium Finishing Plant (PFP) in PR cans pending processing.

WASTE FORM: (RH 117A/217A through RH 117D/217D) Stainless steel cans that originally contained concentrated Pu-nitrate solution which was slurped/vacuumed out and processed for plutonium recovery. The cans have less than 1% by weight of trace elements and meet the RCRA definition of empty. Inorganic items such as scissors and metal baskets may be included with or in the steel cans.

(RH 117E/217E and RH 117F/217F) Plutonium alloy scrap and residues - (Group I): Plutonium alloy scrap and residue items are stored in the PFP vault. These items consist of scrap generated from BNL operations in the 300 Area, and Pu-Al plates and/or plutonium oxide recovered from fuel plates.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| RH 117A<br>RH 217A | The unsealed Mark IV/V PR cans and the Emergency PR cans (10L cans) are housed in a 55-gallon drum. The 55-gallon drum does not contain a rigid liner.   |
| RH 117B<br>RH 217B | The unsealed Mark IV/V PR cans and the Emergency PR cans (10L cans) are housed in a 55-gallon drum.  |
| RH 117C<br>RH 217C | The unsealed standard PR cans (10L cans) are housed in a 55-gallon drum. The 55-gallon drum is overpacked in an 85-gallon drum. Up to six 85-gallon drums are overpacked in a TDOP. The 55-gallon drum does not contain a rigid liner.   |
| RH 117D<br>RH 217D | The unsealed standard PR cans (10L cans) are housed in a 55-gallon drum. The 55-gallon drum is overpacked in an 85-gallon drum. Up to six 85-gallon drums are overpacked in a TDOP.  |
| RH 117E<br>RH 217E | Waste is placed in a slip lid metal can and then placed in up to four filtered inner bags. Bagged material is then placed in a 55-gallon drum.   |
| RH 117F<br>RH 217F | Waste is placed in a slip lid metal can and then placed in up to four filtered inner bags. Bagged waste is then placed in a pipe component. The pipe component is contained in a 55-gallon drum, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the

smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to packaging of cans into pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to packaging of cans into pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.1 or II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is filtered or punctured, if present.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RH 122, RH 222 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solid Inorganic Waste

GENERATING SITE: Richland Hanford

WASTE DESCRIPTION: This waste consists of a variety of noncombustible inorganic solids such as a mixture of high-fired sintered powder and pellets; grit; slag; sand; and mixtures of sand, slag, and crucible.

GENERATING SOURCES: The waste was generated at the Plutonium Finishing Plant (PFP).

WASTE FORM: The items in this waste stream were generated as a result of PFP and other nuclear defense program operations. Most of the inventory was received for plutonium recovery from operations conducted at the Hanford 300 Area or other DOE sites. Oxides are generally expected to be in the form of a dry loose powder or compressed into pellets, and have been thermally treated and undergone thermal decomposition. Pellets will generally be of the same shape and size and are not expected to be random in form or composition. The mixtures of sand, slag, and crucible were generated from the recovery of plutonium for weapons production.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description   |
|--------------------|---|
| RH 122A<br>RH 222A | Waste is placed in a slip lid metal can and then placed in up to two filtered inner bags. Bagged waste is then placed in a pipe component. The pipe component is contained in a 55-gallon drum with Celotex packaging material placed between the pipe component and the rigid liner. The drum liner is then put in place, followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

FREE LIQUIDS: Free liquids are prohibited by waste packaging procedures. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to packaging of cans into pipe overpacks).

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited by waste packaging procedures. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example packaging waste into cans, verification that explosives/compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to packaging of cans into pipe overpacks).

PYROPHORICS: No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

CORROSIVES: The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.1 or II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is filtered or punctured.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RH 123, RH 223 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Leaded Rubber

GENERATING SITE: Richland Hanford

WASTE DESCRIPTION: The waste consists of support equipment, support supplies, and failed equipment containing lead used for glovebox operations.

GENERATING SOURCES: The Plutonium Finishing Plant (PFP) generates waste from operations in the Plutonium Reclamation Facility, Plutonium Conversion - Remote Mechanical C Line, and Product Handling. Plutonium-Uranium Extraction facility (PUREX) generates waste from the plutonium conversion operations and process solution sampling operations.

WASTE FORM: The waste consists of one or more of the following: leaded glass, lead-lined hood gloves, lead blankets, and miscellaneous equipment containing lead, plastic, rubber, cloth, and/or asbestos.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description  |
|--------------------|--|
| RH 123A<br>RH 223A | <p>Waste is packaged in up to two layers of plastic for contamination control. Items that have sharp edges or pointed appendages are padded to maintain package integrity. Heavy items may be packaged in one additional layer of plastic or a thicker plastic bag. Heavy items are blocked to prevent shifting in the drum during transportation or handling.</p> <p>The waste drums are galvanized 55-gallon drums lined with a polyethylene plastic liner bag (minimum 4-mil). The drums may be lined with an optional rigid liner. Approximately 3 liters of diatomaceous earth or universal absorbent may be added to the bottom of the drum liner, and/or absorbent may be added to each individual package of waste that has a potential of containing liquids. All bag closures are by the twist and tape method. If drums are overpacked in SWBs, no closed liner bags are used in the SWB.</p> |

ASSAY: The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times error) and decay heat (plus error).

FREE LIQUIDS: Absorbent may be placed in the bottom of the waste drum and/or in each waste package where the potential of free liquids exists. Any item that may contain free liquid is drained. All CH-TRU waste drums generated at the PFP and PUREX are examined on an RTR unit. This verifies that free liquids are not present.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited at the PFP and the PUREX Plant. The only compressed gas container at the plants that has a potential for entering the waste is an aerosol can. These containers are not allowed in gloveboxes. Aerosol cans are segregated and placed in containers that will not be shipped to WIPP.

PYROPHORICS: The potential for pyrophorics in this waste package does not exist.

CORROSIVES: Based on process knowledge, no corrosives are in this content code.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: The 100% overview with an assay and the RTR assures that the waste and packaging meet the required acceptance criteria. In special cases of high density material, the RTR can be waived provided an independent visual inspection of the waste is performed prior to the final closure of the container. In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. The drums are weighed individually and documented. This ensures compliance to weight limits. The TRU waste at the PFP and PUREX is generated in areas where fission products have been eliminated through a chemical process.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: RH 125, RH 225 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Miscellaneous Debris (Paper, Metal, Glass, Plastic, Cloth)

GENERATING SITE: Richland Hanford

WASTE DESCRIPTION: The waste consists of miscellaneous debris from operational, processing, maintenance, laboratory, and decontamination, and decommissioning activities. This waste may be newly generated or retrievably stored. Plutonium (Pu) alloy scrap mixed with residual organic materials may be included in the waste.

GENERATING SOURCES: The Hanford Site generates TRU waste from various operational, processing, maintenance, laboratory, decontamination, and decommissioning activities throughout the site (e.g., the Plutonium Reclamation Facility, the Plutonium Conversion - Remote Mechanical C Line, the Plutonium Uranium Extraction Facility, laboratory facilities, tank waste storage facilities, environmental remediation activities, and fuels fabrication facilities). The Pu alloy waste was generated from various Hanford plutonium areas including the Plutonium Finishing Plant (PFP) vault. Hanford has also received and currently stores TRU waste of similar form from other DOE complex sites.

WASTE FORM: (RH 125A/225A through RH 125AC/225AC, RH 125AL/225AL through RH 125AN/225AN, RH 125AP/225AP through RH 125AS/225AS) The waste consists of any or all of the following items: surgical gloves, plastic bags and sheets, paper products, cloth, tape, rubber, leather, wood, glass, failed process equipment (various metals, Teflon, various gasket materials, wiring, plastic, etc.), leaded glass, lead-lined hood gloves, lead blankets, light bulbs, fluorescent lamps, flashlight batteries, piping, conduit, wiring, glass and metal portions of gloveboxes, pumps, motors, standard laboratory equipment, air filters, small amounts of soil or rocks, various absorbents, and other miscellaneous debris. The waste may also include empty 10 liter plastic bottles with punctured lids. An absorbent medium will be packaged with the bottles to ensure there are no free liquids.

(RH 125AD/225AD through RH 125AK/225AK) Plutonium alloy scrap and residue items are stored in the PFP vault. Of these items, 75% are scrap generated from BNL operations in the 300 Area, and 15% are Pu-Al plates and/or plutonium oxide recovered from fuel plates. The remaining few items consisting of saw chips, oiled turnings, rods/extrusion pieces, sweeps, and Pu-Zr scrap are from a different source. A plutonium carbide mount may be included in the waste. The description of the small carbide piece indicates that it may be in a plastic metallurgic mount.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| RH 125A<br>RH 225A | Waste is packaged directly in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).                         |
| RH 125B<br>RH 225B | Waste is packaged in one inner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port). |
| RH 125C<br>RH 225C | Waste is packaged in one liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port). |

| Code               | Description*   |
|--------------------|--|
| RH 125D<br>RH 225D | Waste is packaged in two inner bags and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).  |
| RH 125E<br>RH 225E | Waste is packaged in one inner bag and one liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).   |
| RH 125F<br>RH 225F | Waste is packaged in two inner bags and one liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).  |
| RH 125G<br>RH 225G | Waste is packaged in three inner bags and one liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).  |
| RH 125H<br>RH 225H | Waste is packaged in four inner bags and one liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).   |
| RH 125I<br>RH 225I | Waste is packaged in five inner bags and one liner bag and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).   |
| RH 125J<br>RH 225J | Waste is packaged directly in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.  |
| RH 125K<br>RH 225K | Waste is packaged in one liner bag and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.                      |
| RH 125L<br>RH 225L | Waste is packaged in one inner bag and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.                      |
| RH 125M<br>RH 225M | Waste is packaged in one inner bag and one liner bag and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.    |
| RH 125N<br>RH 225N | Waste is packaged in two inner bags and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.                     |
| RH 125P<br>RH 225P | Waste is packaged in two inner bags and one liner bag and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.   |
| RH 125Q<br>RH 225Q | Waste is packaged in three inner bags and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.                   |
| RH 125R<br>RH 225R | Waste is packaged in three inner bags and one liner bag and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction. |
| RH 125S<br>RH 225S | Waste is packaged in three inner bags and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).  |



| Code                 | Description*   |
|----------------------|--|
| RH 125T<br>RH 225T   | Waste is packaged in four inner bags and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).   |
| RH 125U<br>RH 225U   | Waste is packaged in five inner bags and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).   |
| RH 125V<br>RH 225V   | Waste is packaged in six inner bags and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).  |
| RH 125W<br>RH 225W   | Waste is packaged in three inner bags and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.   |
| RH 125X<br>RH 225X   | Waste is packaged in four inner bags and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.  |
| RH 125Y<br>RH 225Y   | Waste is packaged in five inner bags and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.  |
| RH 125Z<br>RH 225Z   | Waste is packaged in six inner bags and then placed in a 55-gallon (208-liter) metal drum. If the 55-gallon drum has a double lid, the inner lid is fitted with a filter having a hydrogen diffusivity greater than or equal to $3.7 \times 10^{-6}$ mol/s/mol fraction.   |
| RH 125AA<br>RH 225AA | Waste is packaged in two filtered inner bags and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).   |
| RH 125AB<br>RH 225AB | Waste is packaged in three filtered inner bags and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).   |
| RH 125AC<br>RH 225AC | Waste is packaged in four filtered inner bags and then placed in a 55-gallon (208-liter) metal drum or an SWB. If the 55-gallon drum has a double lid, the inner lid is unfiltered (i.e., has an open filter port).  |
| RH 125AD<br>RH 225AD | Waste is packaged in a slip lid metal can and then placed in a 55-gallon drum.   |
| RH 125AE<br>RH 225AE | Waste is packaged in a slip lid metal can and then placed in up to two filtered inner bags. Bagged material is then placed in a 55-gallon drum.  |
| RH 125AF<br>RH 225AF | Waste is packaged in a slip lid metal can and then placed in up to three filtered inner bags. Bagged material is then placed in a 55-gallon drum.  |
| RH 125AG<br>RH 225AG | Waste is packaged in a slip lid metal can and then placed in up to four filtered inner bags. Bagged material is then placed in a 55-gallon drum.   |
| RH 125AH<br>RH 225AH | Waste is packaged in a slip lid metal can, which is then placed in a pipe component. The pipe component is contained in a 55-gallon, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |

| Code                 | Description*  |
|----------------------|---|
| RH 125AI<br>RH 225AI | Waste is packaged in a slip lid metal can and then placed in up to two filtered inner bags. Bagged waste is then placed in a pipe component. The pipe component is contained in a 55-gallon drum, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.   |
| RH 125AJ<br>RH 225AJ | Waste is packaged in a slip lid metal can and then placed in up to three filtered inner bags. Bagged waste is then placed in a pipe component. The pipe component is contained in a 55-gallon drum, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |
| RH 125AK<br>RH 225AK | Waste is packaged in a slip lid metal can and then placed in up to four filtered inner bags. Bagged waste is then placed in a pipe component. The pipe component is contained in a 55-gallon drum, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.  |
| RH 125AL<br>RH 225AL | Waste is packaged in a heat-sealed bag, then into four inner bags and one liner bag. The waste is then placed in a 55-gallon (208 liter) metal drum with a filter having a minimum hydrogen diffusivity of $3.7 \times 10^{-6}$ mol/s/mol fraction. The 55-gallon drum does not use a rigid drum liner. Double-lid drums are not included in this configuration.  |
| RH 125AM<br>RH 225AM | Waste is packaged in a heat-sealed bag, then into four inner bags and a rigid liner. The rigid liner is vented. The waste is then packaged in a 55-gallon (208 liter) metal drum with a filter having a minimum hydrogen diffusivity of $3.7 \times 10^{-6}$ mol/s/mol fraction. Double-lid drums are not included in this configuration.   |
| RH 125AN<br>RH 225AN | Waste is packaged in two filtered inner bags and one filtered liner bag, and then placed in a 55-gallon (208 liter) metal drum or an SWB. No rigid liner is used in the drum.   |
| RH 125AP<br>RH 225AP | Waste is packaged in three filtered inner bags and one filtered liner bag, and then placed in a 55-gallon (208 liter) metal drum or an SWB. No rigid liner is used in the drum.   |
| RH 125AQ<br>RH 225AQ | Waste is packaged in one filtered liner bag, and then placed in a 55-gallon (208 liter) metal drum or an SWB. No rigid liner is used in the drum.   |
| RH 125AR<br>RH 225AR | Waste is packaged in one twist-and-tape inner bag placed inside an open metal can, and then placed in two twist-and-tape drum liner bags and placed in a 55-gallon (208 liter) metal drum. No rigid liner is used in the drum.  |
| RH 125AS<br>RH 225AS | Waste is packaged in one filtered inner bag placed inside an open metal can, and then placed in two filtered drum liner bags and placed in a 55-gallon (208) liter metal drum. No rigid liner is used in the drum.  |

\*Confinement layers within the containers are closed only by a twist-and-tape or fold-and-tape method except for Packaging Configurations RH 125AL/225AL and RH 125AM/225AM, which each include one unvented heat-sealed bag. The drums may contain rigid drum liners. Double-lid drums may contain a rigid drum liner without a lid. Some drums, including those repackaged in the Waste Receiving and Processing Facility, may have an HDPE disk in the bottom of the drum and a double lid. All waste containers are inspected prior to shipment certification and are repackaged as necessary. If drums are overpacked in an SWB or a TDOP, no closed liner bags are used in the overpacking container.

**ASSAY:** The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all the smaller packages composing the payload container. The results are expressed as grams of

radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times error) and decay heat (plus error).

FREE LIQUIDS: Waste is packaged to contain less than 1% free liquids. All CH-TRU waste certified at Hanford Site for shipment is examined by RTR or VE techniques, as applicable, to verify that free liquids are not present in excess of WIPP acceptance criteria.

EXPLOSIVES/COMPRESSED GASES: Explosives are prohibited from use or storage at Hanford Site TRU waste storage facilities. RTR or VE techniques are performed, as applicable, on all waste containers certified for shipment to verify the absence of aerosol cans, other pressure vessels, and other prohibited items. Aerosol cans and/or other pressure vessels are segregated and are processed into a WIPP compliant waste form prior to certification and shipment.

PYROPHORICS: Nonradionuclide pyrophoric TRU waste is prohibited from storage at Hanford Site TRU waste storage facilities. RTR or VE techniques are performed, as applicable, on all containers certified for shipment to identify possible pyrophoric materials. Quantities of radioactive pyrophoric material greater than 1% by weight of any waste container are prohibited. Quantities of radioactive pyrophoric materials less than 1% must be generally dispersed in the waste.

CORROSIVES: All CH-TRU waste in this waste stream is certified to contain no corrosives. Corrosives are prohibited by waste packaging procedures. RTR or VE techniques are performed, as applicable, on all containers certified for shipment to verify the absence of corrosive materials (e.g., corrosive batteries). Corrosives are segregated and processed into a WIPP compliant waste form prior to certification and shipment.

CHEMICAL COMPATIBILITY: All CH-TRU waste in this waste stream is certified to contain no incompatible chemical constituents. A chemical compatibility study was done on this content code to verify the waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The CH-TRAMPAC restricts the chemicals found in this content code to the table of allowable materials for Waste Material Type III.1. RTR or VE techniques are performed, as applicable, on all containers certified for shipment to verify the absence of incompatible materials. Any incompatible materials identified in more than trace quantities (>1% by weight) are segregated and processed into a WIPP compliant waste form prior to certification and shipment.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code stored in an unvented condition (i.e., no filter and unpunctured liner) will be vented and aspirated using an option described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: All waste containers will undergo RTR or VE techniques, as applicable, to ensure that waste, as packaged, meets the WIPP Waste Acceptance Criteria and the CH-TRAMPAC requirements for shipment and ultimate disposal. In accordance with the CH-TRAMPAC, each drum, except dunnage drums, is vented with an approved filter, and the rigid drum liner, if present, is punctured or filtered. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with a minimum of nine approved filters. Containers are weighed individually to ensure compliance with weight limits.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The CH-TRAMPAC specifies the maximum allowable wattages for analytical and test category waste.

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CONTENT CODE: RH 130, RH 230 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solid Inorganic with Residual Organic Waste

GENERATING SITE: Richland Hanford

WASTE DESCRIPTION: This waste consists of inorganic items including plutonium alloy scrap (Group II) mixed with residual organic materials (oils, solvents, sweeps, sludges, etc.), Hanford ash, PFP ash, and RFETS ash.

GENERATING SOURCES: The waste was generated from various Richland Hanford plutonium areas, including the Plutonium Finishing Plant (PFP) vault, and RFETS plutonium generating areas.

WASTE FORM: The waste form in this category is comprised of inorganic materials, Pu alloy scrap (Group II), containing greater than 10% Pu and mixed with less than 10% by weight organic materials (oils, solvents, sweeps, etc.). The Hanford, PFP, and RFETS ash consists primarily of products from the incomplete incineration of combustible materials (ash, soot, etc.) and contains less than 10% by weight organic material. The waste is homogeneous with the radioactivity dispersed throughout the waste.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description   |
|--------------------|---|
| RH 130A<br>RH 230A | Waste is packaged in a slip lid metal can. The can is then placed in a 55-gallon drum.  |
| RH 130B<br>RH 230B | Waste is packaged in a slip lid metal can and then placed in up to two filtered inner bags. Bagged material is then placed in a 55-gallon drum.   |
| RH 130C<br>RH 230C | Waste is packaged in a slip lid metal can and then placed in up to three filtered inner bags. Bagged material is then placed in a 55-gallon drum.   |
| RH 130D<br>RH 230D | Waste is packaged in a slip lid metal can and then placed in up to four filtered inner bags. Bagged material is then placed in a 55-gallon drum.  |
| RH 130E<br>RH 230E | Waste is packaged in a slip lid metal can, which is then placed in a pipe component. The pipe component is contained in a 55-gallon drum, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.   |
| RH 130F<br>RH 230F | Waste is packaged in a slip lid metal can and then placed in up to two filtered inner bags. Bagged waste is then placed in a pipe component. The pipe component is contained in a 55-gallon drum, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |

| Code               | Description   |
|--------------------|---|
| RH 130G<br>RH 230G | Waste is packaged in a slip lid metal can and then placed in up to three filtered inner bags. Bagged waste is then placed in a pipe component. The pipe component is contained in a 55-gallon drum, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring. |
| RH 130H<br>RH 230H | Waste is packaged in a slip lid metal can and then placed in up to four filtered inner bags. Bagged waste is then placed in a pipe component. The pipe component is contained in a 55-gallon drum, with celotex packaging material placed between the pipe component and the rigid liner. The drum liner lid is then put in place followed by the filtered drum lid. The drum liner will be filtered or punctured. The lid is then secured to the drum with a bolted closure ring.  |

**ASSAY:** The quantity of radioactive material in payload containers is determined by approved and authorized assay method(s). Assay is either performed directly on the payload container or on all of the smaller waste packages (e.g., cans) composing the payload container. If the payload container is not directly assayed, then the assay values (and errors) for the payload container are calculated from the associated assay results for all of the smaller packages composing the payload container. The results are expressed as grams of radionuclides per individual payload container. Assay results are used to calculate Pu-239 fissile gram equivalent (plus 2 times the error) and decay heat (plus error).

**FREE LIQUIDS:** Free liquids are prohibited by waste packaging procedures. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of unacceptable free liquid. In certain cases, for example packaging waste into cans, verification that unacceptable free liquid is not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to packaging of cans into pipe overpacks).

**EXPLOSIVES/COMPRESSED GASES:** Explosives are prohibited by waste packaging procedures. The waste packaging procedures require that any airtight containers larger than 4 liters and all pressure vessels be vented. Independent examination of waste contents at the time of packaging and/or RTR is used to verify the absence of any airtight containers larger than 4 liters and unvented pressurized containers. In certain cases, for example packaging waste into cans, verification that explosives/ compressed gases are not present may be performed prior to actual waste packaging into the final payload container (e.g., prior to packaging of cans into pipe overpacks). The plutonium-carbide piece shall be stirred to benignly oxidize to plutonium oxide or shall be overpacked with an inert material to protect the small carbide from abrasion and jostling during packaging and shipment.

**PYROPHORICS:** No non-radionuclide pyrophorics have been identified in this content code. Non-radionuclide pyrophorics are prohibited by waste packaging procedures and have been rendered nonreactive prior to placement in the payload container, if necessary. Radionuclide pyrophoric material will be limited to less than 1% by weight of the waste payload in each payload container.

**CORROSIVES:** The waste either does not contain corrosive material, or all corrosive materials are neutralized or removed from the waste prior to or during waste packaging operations.

**CHEMICAL COMPATIBILITY:** A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types III.2 and III.3 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid and each pipe component lid contains a minimum of one filter, and the rigid liner is filtered or punctured, if present.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

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CONTENT CODE: SL 111, SL 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Adsorbed/Solidified Tritium Contaminated Liquid Waste

GENERATING SITE: Sandia National Laboratories/California (SNL/CA)

WASTE DESCRIPTION: Solidified aqueous waste from the solidification of tritium-contaminated water in Super-Fine or Florco clay material.

GENERATING SOURCE: The waste originated from the Tritium Research Laboratory at SNL/CA.

WASTE FORM: This content code consists of solidified tritium-contaminated water. An absorbent clay was used to absorb and solidify the tritium-contaminated water.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code             | Description   |
|------------------|---|
| SL 111<br>SL 211 | The waste, consisting of solidified tritium-contaminated water, has been loaded into one of two types of high-quality, stainless steel, primary containers. Each of the stainless steel containers will be loaded into a DOT Type A, 7A, 17H, 55-gallon drum. The inner stainless steel containers will be packed and stabilized in the drum using additional clay and plywood disks. |

ASSAY: Samples of the tritium contaminated water were analyzed to determine the quantity of tritium to be placed in each inner container. The assay results were expressed in terms of curies of tritium. Assay results were used to determine total grams of tritium and decay heat for each container. Since tritium is not a fissile material, there is no Pu-239 fissile gram equivalent limit.

FREE LIQUIDS: The stainless steel containers were initially filled with absorbent clay (Florco or Super-Fine). The tritium contaminated water is placed in the container and mixed with the absorbent clay. This process results in the absence of any free liquids. The containers are then sealed.

EXPLOSIVES/COMPRESSED GASES: The waste was produced and loaded into the containers in a manner which precluded the introduction or production of explosive or compressed gases. In addition, neither the ingredients nor the finished solidified clay are explosive. When sealed, the internal pressure of the primary container will be 1 atmosphere psia, or less. Very small amounts of hydrogen gas may be generated, but prior to shipment, sampling will be performed on selected primary containers for internal pressure and hydrogen concentration to verify that the packaging limits on pressure and hydrogen concentration are not exceeded during the 60-day shipping period.

PYROPHORICS: No pyrophoric materials have been identified in this waste form. Pyrophorics were prohibited by waste packaging procedures.

CORROSIVES: No unneutralized corrosive materials have been identified in this waste.

CHEMICAL COMPATIBILITY: All waste is chemically compatible to and between the containers, and with the inner containment vessel and O-ring seals. A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1%

weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter vent, and the rigid liner (if present) is punctured, filtered, or used without a lid.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: SQ 111, SQ 211 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Aqueous or Homogeneous Inorganic Solid Waste

GENERATING SITE: Various

WASTE DESCRIPTION: This waste consists of one or more of the following:

- Immobilized/solidified aqueous effluent from plutonium processing
- Immobilized/solidified particulate or sludge-type waste generated during plutonium recovery operations or waste water processing
- Solutions of acidic liquids that have been neutralized and then solidified with an aqueous-based inorganic material
- Soils contaminated by aqueous solutions of plutonium.

GENERATING SOURCES: These wastes were generated from various operations at the sites.

WASTE FORM: The waste includes sludge, grit, fire brick fines, process residue, process leached solids, ash, filter cakes, salts, metal oxides, soils, etc., immobilized/solidified with Aquaset, Petroset, or cement, or absorbed or adsorbed in vermiculite or diatomaceous earth.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| SQ 111A<br>SQ 211A | The waste is placed directly into a 55-gallon drum or an SWB with no layers of confinement.                |
| SQ 111B<br>SQ 211B | The waste is packaged directly into one plastic bag and is then placed into a 55-gallon drum or an SWB.    |
| SQ 111C<br>SQ 211C | The waste is packaged directly into two plastic bags and is then placed into a 55-gallon drum or an SWB.   |
| SQ 111D<br>SQ 211D | The waste is packaged directly into three plastic bags and is then placed into a 55-gallon drum or an SWB. |

\* If drums are overpacked in an SWB, a TDOP, or an 85-gallon drum, no closed liner bags are used inside the SWB, the TDOP, or the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: Assay for all payload containers shall be performed in accordance with the CH-TRAMPAC. The isotopic composition of the waste is determined from measurements taken on the product material during the processing at the site. The processing organizations transmit the isotopic composition information to the site waste certification organization. Therefore, the isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless process information is not available.

FREE LIQUIDS: Liquid waste is prohibited in the payload containers (drums or SWBs) except for residual amounts in well-drained containers. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging procedures ensure that free liquids are less than 1 volume percent of the payload container.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging procedures.

PYROPHORICS: Nonradioactive pyrophorics in the payload containers are prohibited by waste packaging procedures. Waste packaging procedures shall ensure that all pyrophoric radioactive materials are present only in small residual amounts (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload containers. Acids and bases that are potentially corrosive shall be neutralized and rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on these content codes, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter vent, and the rigid liner (if present) is punctured. Each SWB is fitted with a minimum of two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: SQ 112, SQ 212 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solidified Organic Waste

GENERATING SITE: Various

WASTE DESCRIPTION: This waste consists of solidified organic TRU waste.

GENERATING SOURCES: These wastes were generated from various operations at the sites.

WASTE FORM: The solidified organic waste consists of absorbed oils, solvents, paint, or other organic liquids.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| SQ 112A<br>SQ 212A | The waste is placed directly into a 55-gallon drum or an SWB with no layers of confinement.                |
| SQ 112B<br>SQ 212B | The waste is packaged directly into one plastic bag and is then placed into a 55-gallon drum or an SWB.    |
| SQ 112C<br>SQ 212C | The waste is packaged directly into two plastic bags and is then placed into a 55-gallon drum or an SWB.   |
| SQ 112D<br>SQ 212D | The waste is packaged directly into three plastic bags and is then placed into a 55-gallon drum or an SWB. |

\* If drums are overpacked in an SWB, a TDOP, or an 85-gallon drum, no closed liner bags are used inside the SWB, the TDOP, or the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: Assay for all payload containers shall be performed in accordance with the CH-TRAMPAC. The isotopic composition of the waste is determined from measurements taken on the product material during the processing at the site. The processing organizations transmit the isotopic composition information to the site waste certification organization. Therefore, the isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless process information is not available.

FREE LIQUIDS: Liquid waste is prohibited in the payload containers (drums or SWBs) except for residual amounts in well-drained containers. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging procedures ensure that free liquids are less than 1 volume percent of the payload container.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging procedures.

PYROPHORICS: Nonradioactive pyrophorics in the payload containers are prohibited by waste packaging procedures. Waste packaging procedures shall ensure that all pyrophoric radioactive materials are present only in small residual amounts (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload containers. Acids and bases that are potentially corrosive shall be neutralized and rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on these content codes, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type IV.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter vent, and the rigid liner (if present) is punctured. Each SWB is fitted with a minimum of two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: SQ 114, SQ 214 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Cemented Inorganic Process Solids

GENERATING SITE: Various

WASTE DESCRIPTION: This waste consists of particulate and sludge-type wastes that are solidified with Portland cement. The resultant waste is designated inorganic cemented process solids.

GENERATING SOURCES: These wastes were generated from various operations at the sites.

WASTE FORM: The waste includes incinerator ash and sludge, filter cakes, salts, metal oxides, fines, soot, sand, slag, and crucible heels, immobilized into a solid monolith with a Portland cement mixture. The cement mixture used varies by procedure with the type of waste being cemented.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| SQ 114A<br>SQ 214A | The waste is placed directly into a 55-gallon drum or an SWB with no layers of confinement.              |
| SQ 114B<br>SQ 214B | The waste is packaged directly into one plastic bag and is then placed into a 55-gallon drum.            |
| SQ 114C<br>SQ 214C | The waste is packaged directly into two plastic bags and is then placed into a 55-gallon drum or an SWB. |
| SQ 114D<br>SQ 214D | The waste is packaged directly into three plastic bags and is then placed into a 55-gallon drum.         |

\* If drums are overpacked in an SWB, a TDOP, or an 85-gallon drum, no closed liner bags are used inside the SWB, the TDOP, or the 85-gallon drum. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: Assay for all payload containers shall be performed in accordance with the CH-TRAMPAC. The isotopic composition of the waste is determined from measurements taken on the product material during the processing at the site. The processing organizations transmit the isotopic composition information to the site waste certification organization. Therefore, the isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless process information is not available.

FREE LIQUIDS: Liquid waste is prohibited in the payload containers (drums or SWBs) except for residual amounts in well-drained containers. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging procedures ensure that free liquids are less than 1 volume percent of the payload container.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging procedures.

PYROPHORICS: Nonradioactive pyrophorics in the payload containers are prohibited by waste packaging procedures. Waste packaging procedures shall ensure that all pyrophoric radioactive materials are present only in small residual amounts (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload containers. Acids and bases that are potentially corrosive shall be neutralized and rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on these content codes, and all waste is chemically compatible for materials in greater than trace ( $>1\%$  weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type I.3 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter vent, and the rigid liner (if present) is punctured. Each SWB is fitted with a minimum of two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: SQ 120, SQ 220 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Isotopic Source Waste

GENERATING SITE: Various

WASTE DESCRIPTION: The waste consists of sealed sources.

GENERATING SOURCE: These wastes are generated from various operations at the sites.

WASTE FORM: The waste consists of solid, inorganic source material and sources sealed in metal jackets. Sources may include well logging sources used for oil exploration, neutron sources for university research, heat sources, cardiac pacemaker components (source capsules, batteries, and pacemakers), gamma gauges, gauge sources (moisture density gauges, level gauges, bone density gauges), calibration sources (smoke detectors and instrument calibration), and X-ray fluorescence sources for scientific and research applications. Source constituents may include americium-241, plutonium-238, plutonium-239, cesium-137, and beryllium.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table.

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| SQ 120A<br>SQ 220A | The isotopic source is sealed in a metal jacket and/or placed in a metal can. The metal jacket/can may be placed in a maximum of four plastic bags, one of which is a liner bag, and is placed in a 55-gallon drum that may be lined with a rigid liner. The same packaging configuration may be used for a direct load SWB or a direct load TDOP. |

\*If drums are overpacked in an SWB, a TDOP, or an 85-gallon drum, no closed liner bags are used inside the SWB, the TDOP, or the 85-gallon drum. If waste is placed directly into a TDOP, any liner bag is an SWB liner. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: The waste consists of manufactured, sealed isotopic sources. Radiological data are typically well documented by the manufacturer for these sources. Therefore, the isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless documentation is not available. If necessary, assay for all payload containers shall be performed in accordance with the CH-TRAMPAC.

FREE LIQUIDS: There are no free liquids in this waste.

EXPLOSIVES/COMPRESSED GASES: There are no explosives and/or compressed gases in this waste.

PYROPHORICS: There are no pyrophorics in this waste.

CORROSIVES: There are no corrosives in this waste.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities.

The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter vent, and the rigid liner (if present) is punctured. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters. Site personnel shall ensure that packaged isotopic source wastes comply with the external radiation dose rate limits for the payload container and the packaging, as stated in the CH-TRAMPAC.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: SQ 121, SQ 221 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solid Organic Waste

GENERATING SITE: Various

WASTE DESCRIPTION: This waste consists of a variety of combustible and noncombustible organic items.

GENERATING SOURCES: These wastes were generated from various operations at the sites.

WASTE FORM: The waste may include combustible items such as cloth and paper products (e.g., from the cleanup of spills), rags, coveralls and booties, plastic, cardboard, rubber, wood, surgeons gloves, and Kimwipes. The waste may also include filter waste, (e.g., dry box filters, HEPA filters, and filter cartridges); noncombustible Benelex and plexiglas neutron shielding, blacktop, concrete, dirt, and sand; leaded gloves and aprons comprised of Hypalon rubber and lead oxide impregnated neoprene; and small amounts of metal waste. This waste may also include particulate and sludge-type organic process solids immobilized/solidified with Portland cement, vermiculite, Aquaset, or Petroset.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code                 | Description*   |
|----------------------|--|
| SQ 121A<br>SQ 221A   | The waste is placed directly into a 55-gallon drum, an SWB, or a TDOP with no layers of confinement.   |
| SQ 121AA<br>SQ 221AA | The waste is placed directly into a metal can with the filter removed from the bung hole. The metal can is contained in a 55-gallon drum that is lined with a rigid liner. The rigid liner lid is removed. |
| SQ 121B<br>SQ 221B   | The waste is packaged directly into one plastic bag and is then placed into a 55-gallon drum, an SWB, or a TDOP.   |
| SQ 121C<br>SQ 221C   | The waste is packaged directly into two plastic bags and is then placed into a 55-gallon drum, an SWB, or a TDOP.  |
| SQ 121D<br>SQ 221D   | The waste is packaged directly into three plastic bags and is then placed into a 55-gallon drum, an SWB, or a TDOP.  |
| SQ 121DA<br>SQ 221DA | The waste is packaged directly into two plastic inner bags and one plastic liner bag. The waste is then placed into a 55-gallon drum with no rigid liner.  |
| SQ 121E<br>SQ 221E   | The waste is packaged directly into three plastic inner bags and is then placed into a 55-gallon drum with no rigid liner. No closed plastic liner bags are used inside the 55-gallon drum.                |

\* If drums are overpacked in an SWB, a TDOP, or an 85-gallon drum, no closed liner bags are used inside the SWB, the TDOP, or the 85-gallon drum. If waste is placed directly in a TDOP, any liner bag is an SWB liner. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: Assay for all payload containers shall be performed in accordance with the CH-TRAMPAC. The isotopic composition of the waste is determined from measurements taken on the product material during the processing at the site. The processing organizations transmit the isotopic composition

information to the site waste certification organization. Therefore, the isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless process information is not available.

FREE LIQUIDS: Liquid waste is prohibited in the payload containers (drums, SWBs, or TDOPs) except for residual amounts in well-drained containers. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging procedures ensure that free liquids are less than 1 volume percent of the payload container.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging procedures.

PYROPHORICS: Nonradioactive pyrophorics in the payload containers are prohibited by waste packaging procedures. Waste packaging procedures shall ensure that all pyrophoric radioactive materials are present only in small residual amounts (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload containers. Acids and bases that are potentially corrosive shall be neutralized and rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter vent, and the rigid liner (if present) is punctured. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: SQ 122, SQ 222 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Inorganic Solid Waste

GENERATING SITE: Various

WASTE DESCRIPTION: This waste consists of a variety of noncombustible inorganic items.

GENERATING SOURCES: These wastes were generated from various operations at the sites.

WASTE FORM: The waste includes items such as Raschig rings, Leco crucibles, ceramic crucibles, glass, graphite molds and crucibles, graphite-furnace equipment, glovebox windows, laboratory glassware, shielding tools, machinery, hand tools, non-SS metals, and construction materials (cinder blocks, concrete, insulation, sand, and firebrick).

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| SQ 122A<br>SQ 222A | The waste is packaged directly into metal cans and then placed into a 55-gallon drum, an SWB, or a TDOP.            |
| SQ 122B<br>SQ 222B | The waste is packaged directly into one plastic bag and is then placed into a 55-gallon drum, an SWB, or a TDOP.    |
| SQ 122C<br>SQ 222C | The waste is packaged directly into two plastic bags and is then placed into a 55-gallon drum, an SWB, or a TDOP.   |
| SQ 122D<br>SQ 222D | The waste is packaged directly into three plastic bags and is then placed into a 55-gallon drum, an SWB, or a TDOP. |
| SQ 122E<br>SQ 222E | The waste is placed directly into a 55-gallon drum, an SWB, or a TDOP with no layers of confinement                 |

\* If drums are overpacked in an SWB, a TDOP, or an 85-gallon drum, no closed liner bags are used inside the SWB, the TDOP, or the 85-gallon drum. If waste is placed directly in a TDOP, any liner bag is an SWB liner. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: Assay for all payload containers shall be performed in accordance with the CH-TRAMPAC. The isotopic composition of the waste is determined from measurements taken on the product material during the processing at the site. The processing organizations transmit the isotopic composition information to the site waste certification organization. Therefore, the isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless process information is not available.

FREE LIQUIDS: Liquid waste is prohibited in the payload containers (drums, SWBs, or TDOPs) except for residual amounts in well-drained containers. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging procedures ensure that free liquids are less than 1 volume percent of the payload container.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging procedures.

PYROPHORICS: Nonradioactive pyrophorics in the payload containers are prohibited by waste packaging procedures. Waste packaging procedures shall ensure that all pyrophoric radioactive materials are present only in a small residual amount (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload containers. Acids and bases that are potentially corrosive shall be neutralized and rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter, and the rigid liner (if present) will be punctured. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: SQ 125, SQ 225 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Solid Organic and Inorganic Waste

GENERATING SITE: Various

WASTE DESCRIPTION: This waste consists of debris including paper, plastic, metal, and glass.

GENERATING SOURCES: These wastes were generated from various operations at the sites.

WASTE FORM: The debris waste consists of miscellaneous organic and inorganic waste materials including, but not limited to, pipes, capped pipes containing metal waste, paint chips, and lead bricks.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| SQ 125A<br>SQ 225A | The waste is placed directly into a 55-gallon drum, an SWB, a pipe component, or a TDOP with no layers of confinement.              |
| SQ 125B<br>SQ 225B | The waste is packaged directly into one plastic bag and is then placed into a 55-gallon drum, an SWB, or a TDOP.                    |
| SQ 125C<br>SQ 225C | The waste is packaged directly into two plastic bags and is then placed into a 55-gallon drum, an SWB, a pipe component, or a TDOP. |
| SQ 125D<br>SQ 225D | The waste is packaged directly into three plastic bags and is then placed into a 55-gallon drum, an SWB, or a TDOP.                 |

\*If drums are overpacked in an SWB, a TDOP, or an 85-gallon drum, no closed liner bags are used inside the SWB, the TDOP, or the 85-gallon drum. If waste is placed directly in a TDOP, any liner bag is an SWB liner. All bag closures are in accordance with the CH-TRAMPAC. In drums, an HDPE liner may be used.

ASSAY: Assay for all payload containers shall be performed in accordance with the CH-TRAMPAC. The isotopic composition of the waste is determined from measurements taken on the product material during the processing at the site. The processing organizations transmit the isotopic composition information to the site waste certification organization. Therefore, the isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless process information is not available.

FREE LIQUIDS: Liquid waste is prohibited in the payload containers (drums, SWBs, or TDOPs) except for residual amounts in well-drained containers. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging procedures ensure that free liquids are less than 1 volume percent of the payload container.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging procedures.

PYROPHORICS: Nonradioactive pyrophorics in the payload containers are prohibited by waste packaging procedures. Waste packaging procedures shall ensure that all pyrophoric radioactive materials are present only in small residual amounts (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload containers. Acids and bases that are potentially corrosive shall be neutralized and rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on these content codes, and all waste is chemically compatible for materials in greater than trace ( $>1\%$  weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum and pipe component is fitted with a minimum of one filter vent, and the rigid liner (if present) is punctured. Each SWB is fitted with a minimum of two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



CONTENT CODE: SQ 126, SQ 226 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: Cemented/Solidified Organic Process Waste

GENERATING SITE: Various

WASTE DESCRIPTION: This waste consists of cemented/solidified organic sludges and sludge-like materials, and steel and concrete components.

GENERATING SOURCES: These wastes were generated from various operations at the sites.

WASTE FORM: (SQ 126A/226A, SQ 126B/226B, SQ 126C/226C, SQ 126D/226D) The solidifying agent (e.g., Portland cement, Aquaset, or Petroset) is added to the material and allowed to solidify. All particulate and sludge-like wastes are solidified to the point where there is no visible evidence of liquids. The resultant waste is designated cemented or solidified process solids. Examples of the waste constituents can be found in the tables of allowable materials in the CH-TRAMPAC. (SQ 126E/226E, SQ 126F/226F) The waste includes, but is not limited to, sludge containing metal fines from cutting and grinding operations, steel and concrete debris, sand, dirt, and concrete dust/particulate.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*  |
|--------------------|---|
| SQ 126A<br>SQ 226A | The waste is placed/processed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in an inner bag or container, the inner bag or container is not closed and is therefore not considered a layer of confinement and provides no resistance to the release of hydrogen gas.   |
| SQ 126B<br>SQ 226B | The waste is placed/processed in a 55-gallon drum, an SWB, or a TDOP, which is lined with a plastic bag.  |
| SQ 126C<br>SQ 226C | The waste is packaged directly into two plastic bags and is then placed into a 55-gallon drum, an SWB, or a TDOP.   |
| SQ 126D<br>SQ 226D | The waste is packaged directly into three plastic bags and is then placed into a 55-gallon drum, an SWB, or a TDOP.   |
| SQ 126E<br>SQ 226E | The waste is placed directly into a pipe component with no layers of confinement or is placed in one or more metal or plastic layers and then placed in a pipe component. If the waste is first placed in metal or plastic layers, the layers allow for free gas release (e.g., containers are not sealed, are punctured, or are less than four liters in volume; bags are not closed, are punctured, or have deteriorated over time) and, therefore, there are no layers of confinement. |
| SQ 126F<br>SQ 226F | The waste is packaged directly into two plastic bags and is then placed into a pipe component or is placed in one or more metal or plastic layers and then placed in a pipe component. If the bagged out waste is first placed in metal or plastic layers, the layers allow free gas release (e.g., containers are not sealed, are punctured, or are less than four liters in volume; bags are not closed, or are punctured) and, therefore, there are only two layers of confinement.    |

\*If drums are overpacked in an SWB, a TDOP, or an 85-gallon drum, no closed liner bags are used inside the SWB, the TDOP, or the 85-gallon drum. If waste is placed directly in a TDOP, any liner bag is an SWB liner. All bag closures are in accordance with the CH-TRAMPAC. In drums, an HDPE liner may be used.

ASSAY: Assay for all payload containers shall be performed in accordance with the CH-TRAMPAC. The isotopic composition of the waste is determined from measurements taken on the product material during the processing at the site. The processing organizations transmit the isotopic composition information to the site waste certification organization. Therefore, the isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless process information is not available.

FREE LIQUIDS: Liquid waste is prohibited in the payload containers (drums, SWBs, or TDOPs) except for residual amounts in well-drained containers. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging procedures ensure that free liquids are less than 1 volume percent of the payload container.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging procedures.

PYROPHORICS: Nonradioactive pyrophorics in the payload containers are prohibited by waste packaging procedures. Waste packaging procedures shall ensure that all pyrophoric radioactive materials are present only in small residual amounts (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload containers. Acids and bases that are potentially corrosive shall be neutralized and rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on these content codes, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum is fitted with a minimum of one filter vent, and the rigid liner (if present) is punctured. Each SWB is fitted with a minimum of two and up to four filters. Each TDOP is fitted with at least nine filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: SR 117, SR 217 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Metal Pipe Waste

GENERATING SITE: Savannah River Site (SRS)

WASTE DESCRIPTION: The waste consists of segments of pipe containing TRU material from separations processes.

GENERATING SOURCES: The waste originates from the Separations Equipment Development (SED) facility, Building 773-A, at SRS.

WASTE FORM: The pipe segments were integral parts of the facility hardware and contain plutonium adsorbed onto a medium of alumina. The waste is completely inorganic.

WASTE PACKAGING: Details of the packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description   |
|--------------------|---|
| SR 117A<br>SR 217A | <p>A closure plate fitted with an O-ring gasket is bolted over each flanged opening where the pipe segment was previously attached to other apparatus. The gasket material deforms under bolting load to occupy irregularities between mating surfaces, sealing particulates inside the pipe segment.</p> <p>The detached pipe segment may be enveloped by up to three folded but otherwise unsealed PVC bags for protection of handling personnel. The final assemblage is placed directly into an SWB. The SWB is outfitted with appropriate shoring to locate the pipe segment securely in the center of the SWB and prevent movement within the SWB during transport.</p> <p>Only one SWB containing waste will be shipped in each packaging.</p> |

ASSAY: The pipe segments are assayed by non-destructive procedures to determine the Pu-239 or fissile gram equivalent content. Gamma pulse height analysis and passive neutron methods are used to assay the TRU content of each pipe segment. Assay results are used to calculate Pu-239 fissile gram equivalent (plus two times the error) and decay heat (plus error).

FREE LIQUIDS: The pipe segments are radiographed for evidence of internal liquids prior to removal from associated apparatus for assay. If liquid is found in a pipe segment either by radiograph or by visual inspection during removal for assay, SRS procedures require halting work immediately. The TRU waste will be packaged and shipped free of liquids.

EXPLOSIVES/COMPRESSED GASES: Explosive materials are neither contained in nor a part of the pipe segments. SRS procedures prohibit entry of any foreign material into controlled areas where TRU material is present. In addition, the apparatus to which the pipe segments are connected tested negatively for the presence of hydrogen. The TRU waste will be packaged and shipped free of explosive materials.

PYROPHORICS: Pyrophoric materials are neither contained in nor a part of the pipe segments. SRS procedures prohibit entry of any foreign material into controlled areas where TRU material is present. The TRU waste will be packaged and shipped free of pyrophoric materials.

CORROSIVES: Corrosive materials are neither contained in nor a part of the pipe segments. No corrosive materials were involved in the process which produced the TRU waste, or in the process of its assay or in removal for disposal. The TRU waste will be packaged and shipped free of corrosive materials.

CHEMICAL COMPATIBILITY: A formal Technical Data Summary for SED Facilities identifies chemicals used in every aspect of facility operation and states that there are no chemical incompatibilities. A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace ( $>1\%$  weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each SWB is fitted with at least two and up to four filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: SR 122, SR 222 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Noncombustible Waste

GENERATING SITE: Savannah River Site (SRS)

WASTE DESCRIPTION: Noncombustible waste is produced from onsite laboratory and production facilities. It consists of contaminated equipment and miscellaneous incidental wastes.

GENERATING SOURCE: The waste originates from the plutonium production facilities (221-HB Line and 221-FB Line) and Laboratories (772-F, 773-A and 235-F) at SRS.

WASTE FORM: This content code consists of noncombustible waste such as small tools, glassware, metal cans, etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| SR 122A<br>SR 222A | The waste is packaged in two plastic inner bags and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.   |
| SR 122B<br>SR 222B | The waste is packaged in three plastic inner bags and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner. |
| SR 122C<br>SR 222C | The waste is packaged in four plastic inner bags and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.  |
| SR 122D<br>SR 222D | The waste is placed directly in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner. No other layers of confinement are used.                          |
| SR 122E<br>SR 222E | The waste is packaged in one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.                              |
| SR 122F<br>SR 222F | The waste is packaged in one plastic inner bag and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.    |
| SR 122G<br>SR 222G | The waste is packaged in five plastic inner bags and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.  |
| SR 122H<br>SR 222H | The waste is packaged in a metal can as the innermost layer of confinement and is then placed in a 55-gallon drum, an SWB, or a TDOP. If waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.      |

\* If drums are overpacked in an SWB or a TDOP, no closed liner bags are used inside the SWB or TDOP. If waste is placed directly in a TDOP, any liner bag is an SWB liner. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: Assay for all payload containers shall be performed in accordance with the CH-TRAMPAC. The isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless process information is not available.

FREE LIQUIDS: Liquid waste is prohibited in the payload containers except for residual amounts in well-drained containers. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging or waste certification procedures ensure that free liquids are less than 1 volume percent of the payload container.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging or waste certification procedures.

PYROPHORICS: Nonradioactive pyrophorics in the payload containers are prohibited by waste packaging procedures. Waste packaging procedures shall ensure that all pyrophoric radioactive materials are presently only in small residual amounts (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload containers. Acids and bases that are potentially corrosive shall be neutralized and rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Types II.1 and II.2 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid contains a minimum of one filter, and the rigid liner is punctured or filtered, if present. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine and up to ten filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.

CONTENT CODE: SR 125, SR 225 (See Waste Packaging Description Table)

CONTENT DESCRIPTION: TRU Combustible Waste

GENERATING SITE: Savannah River Site (SRS)

WASTE DESCRIPTION: Combustible waste is produced from onsite laboratory and production facilities. It consists of contaminated equipment and miscellaneous incidental wastes.

GENERATING SOURCE: The waste originates from the plutonium production facilities (221-HB Line and 221-FB Line) and Laboratories (772-F, 773-A and 235-F) at SRS.

WASTE FORM: SRS combustible waste consists of dry, solid waste materials such as plastics, wood, cloth, paper, and other incidental wastes. This content code may contain some noncombustible such as small tools, metal cans, glassware, etc.

WASTE PACKAGING: Details of the waste packaging for each code are presented in the following table:

**WASTE PACKAGING DESCRIPTION TABLE**

| Code               | Description*   |
|--------------------|--|
| SR 125A<br>SR 225A | The waste is packaged in four plastic inner bags and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.  |
| SR 125B<br>SR 225B | The waste is placed directly in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner. No other layers of confinement are used.                          |
| SR 125C<br>SR 225C | The waste is packaged in one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.                              |
| SR 125D<br>SR 225D | The waste is packaged in one plastic inner bag and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.    |
| SR 125E<br>SR 225E | The waste is packaged in two plastic inner bags and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.   |
| SR 125F<br>SR 225F | The waste is packaged in three plastic inner bags and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner. |
| SR 125G<br>SR 225G | The waste is packaged in five plastic inner bags and one plastic liner bag and is then placed in a 55-gallon drum, an SWB, or a TDOP. If the waste is placed in a 55-gallon drum, the drum may be fitted with a rigid drum liner.  |

\*If drums are overpacked in an SWB or a TDOP, no closed liner bags are used inside the SWB or TDOP. If waste is placed directly in a TDOP, any liner bag is an SWB liner. All bag closures are in accordance with the CH-TRAMPAC.

ASSAY: Assay for all payload containers shall be performed in accordance with the CH-TRAMPAC. The isotopic composition of the waste need not be determined by direct analysis or measurement of the waste unless process information is not available.

FREE LIQUIDS: Liquid waste is prohibited in the payload containers except for residual amounts in well-drained containers. The total volume of residual liquid in a payload container shall be less than 1 volume percent of the payload container. Waste packaging or waste certification procedures ensure that free liquids are less than 1 volume percent of the payload container.

EXPLOSIVES/COMPRESSED GASES: Explosives and compressed gases in the payload containers are prohibited by waste packaging or waste certification procedures.

PYROPHORICS: Nonradioactive pyrophorics in the payload containers are prohibited by waste packaging procedures. Waste packaging procedures shall ensure that all pyrophoric radioactive materials are presently only in small residual amounts (less than 1 weight percent) in payload containers.

CORROSIVES: Corrosives are prohibited in the payload containers. Acids and bases that are potentially corrosive shall be neutralized and rendered noncorrosive prior to being a part of the waste. The physical form of the waste and the waste generating procedures ensure that the waste is in a nonreactive form.

CHEMICAL COMPATIBILITY: A chemical compatibility study has been performed on this content code, and all waste is chemically compatible for materials in greater than trace (>1% weight) quantities. The chemicals found in this content code are restricted to the table of allowable materials for Waste Material Type III.1 in the CH-TRAMPAC.

PAYLOAD CONTAINER VENTING AND ASPIRATION: Payload containers in this content code that have been stored in an unvented condition (i.e., no filter and unpunctured liner) will be aspirated using one of the three options described in the CH-TRAMPAC.

ADDITIONAL CRITERIA: In accordance with the CH-TRAMPAC, each drum lid contains a minimum of one filter, and the rigid liner is punctured or filtered, if present. Each SWB is fitted with at least two and up to four filters. Each TDOP is fitted with at least nine and up to ten filters.

SHIPPING CATEGORY: See Table 2, Summary of Approved Content Codes and Corresponding Shipping Categories.

MAXIMUM ALLOWABLE WATTAGE: The maximum allowable wattages for analytical and test category waste are specified in the CH-TRAMPAC.



## **Appendix A**

### **List of Chemicals and Materials in CH-TRU Waste Content Codes**

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## INTRODUCTION

This appendix provides site-specific chemical lists for waste to be transported in the Transuranic Package Transporter-II (TRUPACT-II) or the HalfPACT packagings. Waste generated and stored at U.S. Department of Energy and small quantity sites to be transported in the TRUPACT-II or HalfPACT must be defined in a content code included in the currently approved version of the CH-TRU Waste Content Codes (CH-TRUCON) document, and each content code must have an associated approved chemical list in this appendix. The chemical lists contained in this appendix are restricted to the allowable chemical lists for each waste material type found in Section 4.0 of the CH-TRU Waste Authorized Methods for Payload Control (CH-TRAMPAC). Compliance with the lists of allowable materials in Tables 4-1 through 4-8 of the CH-TRAMPAC has been demonstrated for each chemical list corresponding to each content code. Chemicals/materials that are not included on the list of allowable materials for a given waste material type are limited to a total combined quantity of less than 5 weight percent as specified in the CH-TRAMPAC.

The chemicals/materials listed for each content code are described as “dominant,” “minor,” or “trace.” The chemical list designations are as follows:

- D Dominant Component (>10% by weight)
- M Minor Component (1-10% by weight)
- T Trace Component (<1% by weight)
- T1 Trace Component (<0.1% by weight)
- T2 Trace Component (low ppm range)
- T3 Trace Component (<1 ppm range).

All proposed changes to this appendix shall be evaluated and approved by the CH-TRU Payload Engineer according to the process described in Section 1.5 of the CH-TRAMPAC. A proposed change to the chemical list for any content code shall be evaluated by the CH-TRU Payload Engineer for compliance with the lists of allowable materials in Tables 4-1 through 4-8 of the CH-TRAMPAC and all other transportation parameters (i.e., chemical compatibility and gas generation), as described in the CH-TRAMPAC.

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Argonne National Laboratory - East  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code AE 111/211

SOLIDIFIED AQUEOUS WASTE

|  |   |   |
|--|---|---|
| GROUP 1:                                 | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.) | D |
| GROUP 2:                                 | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)     | D |
| GROUP 22:                                | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES                | M |
| GROUP 23:                                | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.                   | M |
| GROUP 24:                                | METALS AND METAL COMPOUNDS, TOXIC   | M |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)     | M |
| OTHER INORGANICS                         |   | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |   |
|  | Aquaset/Petroset  | D |
|  | Cement  | D |
|  | Envirostone   | D |
|  | Vermiculite   | D |

Refer to Introduction for a description of the designations used in this chemical list.

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Argonne National Laboratory - East  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code AE 116/216

TRU COMBUSTIBLE WASTE

|            |  |   |
|------------|--|---|
| GROUP 19:  | KETONES<br>Acetone   | T1  |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Chromium<br>Copper<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum<br>Titanium<br>Zirconium   | D<br>M<br>T<br>M<br>M<br>M<br>M<br>M<br>T<br>T<br>T                               |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Barium chloride<br>Beryllium<br>Cadmium<br>Chromium<br>Copper<br>Lead<br>Mercury<br>Titanium<br>Zirconium  | T<br>T<br>T<br>M<br>T<br>M<br>M<br>T<br>T<br>T<br>T                               |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Bakelite<br>Carbon (Spent, Activated)<br>Cellulose<br>Grease<br>Oil<br>Paper<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride<br>Resins (Cation and Anion)<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Wood | T<br>T<br>D<br>M<br>M<br>D<br>D<br>M<br>M<br>M<br>M<br>M<br>M<br>D<br>T<br>M<br>M |

Argonne National Laboratory - East  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code AE 116/216  
(Continued)

## TRU COMBUSTIBLE WASTE

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Glass, labware                           | D |
| Grit                                     | T |
| Insulation                               | T |
| Lithium salts                            | D |
| Salts                                    | D |
| Sand                                     | T |
| Slag                                     | T |
| Sodium salts                             | D |
| Soil                                     | T |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Cement                                   | T |
| Concrete                                 | M |
| Emulsifiers (Sodium lauryl sulfate)      | M |
| Envirostone                              | M |
| Oil-Dri                                  | M |
| Sludge                                   | M |
| Vermiculite                              | M |

Refer to Introduction for a description of the designations used in this chemical list.

Argonne National Laboratory - East  
List of Chemicals and Materials  
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Content Code AE 129/229

COMBINED SOLIDIFIED ORGANICS

|  |   |                            |
|--|---|----------------------------|
| GROUP 3:                                 | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)  | D                          |
| GROUP 4:                                 | ALCOHOLS AND GLYCOLS<br>Polyethylene glycol   | D                          |
| GROUP 16:                                | HYDROCARBONS, AROMATIC<br>Trimethylbenzene<br>Xylene  | D<br>D                     |
| GROUP 17:                                | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Methylene chloride<br>Trichloroethylene     | D<br>D<br>D<br>D<br>D<br>D |
| GROUP 29:                                | HYDROCARBON, ALIPHATIC, SATURATED<br>N-Paraffin hydrocarbons (NPH)  | D                          |
| GROUP 32:                                | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate  | D                          |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Oil (Absorbed)<br>Polyethylene (Packaging material)<br>Polyethylene glycol<br>Polyvinyl chloride (Packaging material) | D<br>D<br>D<br>D           |
| OTHER INORGANICS                         | Calcium silicate<br>Potassium sulfate   | D<br>D                     |
| OTHER SOLIDIFICATION MATERIALS/ABSORBENT | Aqueous solutions and mixtures (Fixed in matrix)<br>Concrete<br>Envirostone<br>Magnesia Cement (Hydrated)<br>Portland Cement<br>Sludge                                      | D<br>D<br>D<br>D<br>D<br>D |

Refer to Introduction for a description of the designations used in this chemical list.

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Argonne National Laboratory - West  
List of Chemicals and Materials  
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Content Code AW 111/211

TRU SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLIDS

|           |  |  |
|-----------|--|--|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Boric acid<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid | T<br>T<br>T<br>T<br>T                                    |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid<br>Sulfamic acid   | M<br>T<br>T  |
| GROUP 3:  | ACIDS, ORGANIC (ALL ISOMERS)<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Oxalic acid   | T<br>T   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butyl alcohol<br>Decanol<br>Ethanol<br>Hexanol<br>Isobutanol<br>Isopropanol<br>Methanol<br>Octanol<br>Propanol   | T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1 |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium carbonate<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide           | T<br>T<br>M<br>T<br>M                                    |
| GROUP 14: | ETHERS<br>Di-butylcyclohexano-18-crown-6 ether   | T1   |
| GROUP 19: | KETONES<br>Acetone<br>Diethyl ketone<br>Diisobutyl ketone<br>Methyl ethyl ketone   | T1<br>T1<br>T1<br>T1                                     |

Argonne National Laboratory - West  
List of Chemicals and Materials  
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Content Code AW 111/211  
(Continued)

TRU SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLIDS

|            |   |   |
|------------|---|---|
| GROUP 21:  | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Calcium<br>Cesium<br>Lithium<br>Magnesium<br>Potassium<br>Rubidium<br>Sodium              | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T                                       |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Antimony<br>Cadmium<br>Chromium<br>Lead<br>Metal cans (Tin)<br>Selenium<br>Zinc<br>Zirconium   | T2<br>M<br>T2<br>M<br>M<br>T2<br>T2<br>M  |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Antimony<br>Arsenic<br>Barium<br>Beryllium<br>Cadmium<br>Chromium<br>Calcium<br>Lead<br>Nickel<br>Potassium permanganate<br>Selenium<br>Silver<br>Strontium<br>Zinc<br>Zirconium | T2<br>T2<br>T<br>T2<br>M<br>T2<br>T<br>M<br>M<br>T2<br>T2<br>T2<br>T<br>T2<br>M |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES, AND<br>PHOSPHODITHIOATES<br>CMPO (Organophosphate)   | T2  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)<br>Tape (Packaging material)   | M<br>M<br>M   |

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TRU SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLIDS

|            |   |                                  |
|------------|---|----------------------------------|
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>Sodium nitrate  | T                                |
| GROUP 105: | REDUCING AGENTS, STRONG<br>Calcium<br>Hydroxyl amine<br>Sodium  | T<br>T<br>T                      |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Calcium<br>Hydrobromic acid<br>Lithium<br>Potassium<br>Sodium<br>Sulfuric acid   | T<br>T<br>T<br>T<br>T<br>T<br>T  |
|            | OTHER INORGANICS<br>Aluminum nitrate<br>Grit<br>Lithium-metaborate fluxes<br>Reduced metal alloys (Thermal treatment product)<br>Refractory (Oxides of Al, Si, Cr, Mg)<br>Slag (Oxides of Si, Al, Fe, Ca, Na, K, Mg)<br>Zeolites (Aluminum silicates) | T<br>T<br>T2<br>M<br>M<br>M<br>T |
|            | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Aquaset/Petroset<br>Diatomaceous Earth<br>Oil-Dri<br>Portland Cement (Hydrated)   | D<br>D<br>M<br>D                 |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU ORGANIC SOLID WASTE

|           |  |  |
|-----------|--|--|
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butyl alcohol<br>Decanol<br>Ethanol<br>Hexanol<br>Isobutanol<br>Isopropanol<br>Methanol<br>Octanol<br>Propanol   | T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1 |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium carbonate  | T  |
| GROUP 14: | ETHERS<br>Di-butylcyclohexano-18-crown-6 ether   | T1   |
| GROUP 19: | KETONES<br>Acetone<br>Diethyl ketone<br>Diisobutyl ketone<br>Methyl ethyl ketone   | T1<br>T1<br>T1<br>T1                                     |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Batteries (Lithium-based)   | T<br>T   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Transuranic elements<br>Zirconium   | T<br>T   |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Antimony<br>Cadmium<br>Chromium<br>Copper<br>Filter housings (Metal)<br>Iron<br>Lead<br>Metal cans (Tin) | M<br>T2<br>M<br>T2<br>M<br>D<br>D<br>D<br>M              |

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## TRU ORGANIC SOLID WASTE

|            |  |   |
|------------|--|---|
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC. (Continued)<br>Nichrome heating elements<br>Nickel Wire<br>Selenium<br>Silver pH electrodes<br>Tantalum<br>Titanium<br>Zinc<br>Zirconium  | <br>T<br>T<br>T2<br>T<br>T<br>T<br>T2<br>T  |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Antimony<br>Arsenic<br>Barium<br>Beryllium<br>Cadmium<br>Chromium<br>Copper<br>Lead<br>Nickel<br>Potassium permanganate<br>Selenium<br>Silver<br>Titanium<br>Zinc<br>Zirconium  | <br>T<br>T2<br>T2<br>T2<br>T2<br>T<br>M<br>M<br>T2<br>M<br>T2<br>T<br>T<br>T2<br>T2 |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES, AND PHOSPHODITHIOATES<br>CMPO (Organophosphate)   | <br>T3  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Neoprene<br>Oil<br>Paint chips (Solidified in Portland Cement)<br>Paper<br>Polyester<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride<br>Resins (Cation and Anion)<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Wood | <br>T<br>D<br>T<br>M<br>D<br>T<br>D<br>M<br>M<br>M<br>D<br>M<br>M<br>M<br>M         |

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TRU ORGANIC SOLID WASTE

|                  |  |   |
|------------------|--|---|
| GROUP 104:       | OXIDIZING AGENTS, STRONG<br>Potassium permanganate<br>Sodium nitrate   | T2<br>T   |
| GROUP 105:       | REDUCING AGENTS, STRONG<br>Hydroxyl amine  | T   |
| GROUP 107:       | WATER REACTIVE SUBSTANCES<br>Barium  | T   |
| OTHER ORGANICS   | Filter media<br>Hydraulic fluid<br>Lexan (Glovebox windows)<br>Polycarbonate<br>Tape (Packaging material)<br>Tetrafluoroethylene (Teflon ®)  | M<br>M<br>D<br>D<br>M                               |
| OTHER INORGANICS | Aluminum nitrate<br>Ceramic heating insulators<br>Diamond saw blades<br>Fiberglass (HEPA Filter media)<br>Glass labware<br>Grit<br>Lithium-metaborate fluxes<br>Reduced metal alloys (Thermal treatment product)<br>Refractory (Oxides of Al, Si, Cr, Mg)<br>Slag (Oxides of Si, Al, Fe, Ca, Na, K, Mg)<br>Zeolites (Aluminum silicates) | T<br>M<br>T<br>M<br>M<br>T<br>T<br>M<br>M<br>M<br>T |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU INORGANIC SOLID WASTE

|           |   |  |
|-----------|---|--|
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium carbonate   | T  |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Hydrofluoric acid<br>Potassium fluoride<br>Sodium fluoride  | T<br>T<br>T<br>T   |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Batteries (Lithium-based)  | T<br>T   |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Antimony<br>Cadmium<br>Chromium<br>Copper<br>Filter housings (Metal)<br>Iron<br>Lead<br>Metal cans (Tin)<br>Nichrome heating elements<br>Nickel wire<br>Silver pH electrodes<br>Tantalum<br>Titanium<br>Zirconium | M<br>T2<br>M<br>T2<br>M<br>D<br>D<br>M<br>M<br>T<br>T<br>T<br>T<br>T |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Antimony<br>Arsenic<br>Barium<br>Beryllium<br>Cadmium<br>Chromium<br>Copper<br>Lead<br>Nickel  | T2<br>T2<br>T<br>T2<br>M<br>T2<br>M<br>M<br>M<br>T                   |

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TRU INORGANIC SOLID WASTE

|            |  |  |
|------------|--|--|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC (Continued)<br>Potassium permanganate<br>Selenium<br>Silver<br>Titanium<br>Zinc  | T2<br>T2<br>T2<br>T<br>T2                            |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES, AND<br>PHOSPHODITHIOATES<br>CMPO (Organophosphate)  | T2   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)<br>Tape (Packaging material)  | M<br>M<br>M  |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>Potassium permanganate<br>Sodium nitrate   | T2<br>T  |
| GROUP 105: | REDUCING AGENTS, STRONG<br>Hydroxyl amine  | T  |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>Barium  | T  |
|            | OTHER INORGANICS<br>Aluminum nitrate<br>Ceramic heating insulators<br>Diamond saw blades<br>Fiberglass (HEPA Filter media)<br>Glass labware<br>Grit<br>Lithium-metaborate fluxes<br>Reduced metal alloys (Thermal treatment product)<br>Refractory (Oxides of Al, Si, Cr, Mg)<br>Slag (Oxides of Si, Al, Fe, Ca, Na, K, Mg)<br>Zeolites (Aluminum silicates) | T<br>M<br>T<br>M<br>M<br>T<br>T2<br>D<br>D<br>D<br>T |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU COMBUSTIBLE AND NONCOMBUSTIBLE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Boric acid<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid   | T<br>T<br>T<br>T<br>T   |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)<br>Sulfamic acid  | M<br>T<br>T   |
| GROUP 3:  | ACIDS, ORGANIC (ALL ISOMERS)<br>(Constituents reacted prior to loading in payload containers.)<br>Diethylenethiaminepentaacetic acid (DPTA)<br>Ethylene diaminetetraacetic acid (EDTA)<br>Acetic acid<br>Oxalic acid<br>Sodium citrate | T<br>T<br>T<br>T<br>T   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butyl alcohol<br>Deconal<br>Ethanol<br>Ethylene glycol<br>Hexanol<br>Isobutanol<br>Isopropanol<br>Methanol<br>Octanol<br>Propanol  | T1<br>T1<br>T1<br>T<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1 |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to lading in payload containers.)<br>Ammonium hydroxide<br>Calcium carbonate<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide  | T<br>T<br>M<br>T<br>M   |
| GROUP 14: | ETHERS<br>Di-butylcyclohexono-18-crown-6-ether   | T1  |
| GROUP 19: | KETONES<br>Acetone<br>Diethyl ketone<br>Diisobutyl ketone<br>Methyl ethyl ketone   | T<br>T1<br>T1<br>T1   |

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TRU COMBUSTIBLE AND NONCOMBUSTIBLE WASTE

|           |   |   |
|-----------|---|---|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Batteries (Lithium-based)<br>Calcium<br>Cesium<br>Lithium<br>Magnesium<br>Potassium<br>Rubidium<br>Sodium   | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Transuranic elements<br>Zirconium   | T<br>M  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Antimony<br>Cadmium<br>Chromium<br>Carbon steel<br>Copper<br>Filter housings (Metal)<br>Iron<br>Lead<br>Metal cans (Tin)<br>Nichrome heating elements<br>Nickel wire<br>Platinum<br>Selenium<br>Silver pH electrodes<br>Stainless Steel<br>Tantalum<br>Technetium<br>Titanium<br>Zinc<br>Zirconium | M<br>T<br>M<br>T<br>D<br>M<br>D<br>D<br>D<br>M<br>T<br>T<br>M<br>T2<br>T<br>D<br>T<br>T<br>M<br>T2<br>M |



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TRU COMBUSTIBLE AND NONCOMBUSTIBLE WASTE

|            |   |    |
|------------|---|----|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC                           |    |
|            | Antimony  | T  |
|            | Arsenic   | T2 |
|            | Barium  | T  |
|            | Beryllium   | T2 |
|            | Boron nitride   | T  |
|            | Cadmium   | M  |
|            | Chromium  | T  |
|            | Copper  | M  |
|            | Lead  | M  |
|            | Nickel  | M  |
|            | Potassium permanganate                                      | T2 |
|            | Selenium  | T2 |
|            | Silver  | T2 |
|            | Strontium   | T  |
|            | Titanium  | M  |
|            | Zinc  | T2 |
|            | Zirconium   | M  |
| GROUP 25:  | NITRIDES  |    |
|            | Boron nitride   | T  |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES, AND<br>PHOSPHODITHIOATES |    |
|            | CMPO (Organophosphate)                                      | T2 |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS          |    |
|            | Beeswax   | M  |
|            | Cellulose   | D  |
|            | Grease  | T  |
|            | Neoprene (Leaded and Non-Leaded)                            | D  |
|            | Oil   | M  |
|            | Paint chips (Solidified in Portland Cement)                 | D  |
|            | Paper   | D  |
|            | Polyester   | T  |
|            | Polyethylene  | D  |
|            | Polypropylene   | M  |
|            | Polystyrene   | M  |
|            | Polyurethane  | M  |
|            | Polyvinyl chloride  | D  |
|            | Resins (Cation and Anion)                                   | M  |
|            | Rubber gloves (Leaded)                                      | D  |
|            | Synthetic rubber  | M  |
|            | Tape (Packaging material)                                   | M  |
|            | Wood  | M  |
| GROUP 104: | OXIDIZING AGENTS, STRONG                                    |    |
|            | Potassium permanganate                                      | T2 |
|            | Sodium nitrate  | T  |

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TRU COMBUSTIBLE AND NONCOMBUSTIBLE WASTE

|  |  |    |
|--|--|----|
| GROUP 105:                               | REDUCING AGENTS, STRONG  |    |
|  | Calcium  | T  |
|  | Hydroxyl amine   | T  |
|  | Sodium   | T  |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES                                      |    |
|  | (Constituents reacted prior to loading in payload containers.) | T  |
|  | Barium   | T  |
|  | Calcium  | T  |
|  | Hydrobromic acid   | T  |
|  | Lithium  | T  |
|  | Sodium   | T  |
|  | Sulfuric acid  |    |
| OTHER ORGANICS                           |  |    |
|  | Filter media   | M  |
|  | Hydraulic fluid  | M  |
|  | Lexan (Glovebox windows)                                       | D  |
|  | Polycarbonate  | M  |
|  | Tetrafluoroethylene (Teflon ®)                                 | M  |
| OTHER INORGANICS                         |  |    |
|  | Aluminum nitrate   | T  |
|  | Ceramic heating insulators                                     | M  |
|  | Diamond saw blades   | T  |
|  | Fiberglass (HEPA Filter media)                                 | M  |
|  | Glass frit   | M  |
|  | Glass labware  | M  |
|  | Grit   | T  |
|  | Lithium chloride   | M  |
|  | Lithium-metaborate fluxes                                      | T2 |
|  | Potassium chloride   | M  |
|  | Reduced metal alloys (Thermal treatment product)               | M  |
|  | Refractory (Oxides of Al, Si, Cr, Mg)                          | M  |
|  | Slag (Oxides of Si, Al, Fe, Ca, Na, K, Mg)                     | M  |
|  | Zeolites (Aluminum silicates)                                  | T  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |  |    |
|  | Aquaset/Petroset   | D  |
|  | Diatomaceous Earth   | D  |
|  | Oil-Dri  | M  |
|  | Portland Cement (Hydrated)                                     | D  |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU COMBINED SOLID ORGANICS, SOLID INORGANICS, AND SOLIDIFIED INORGANICS

|           |  |  |
|-----------|--|--|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Boric acid<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid | T<br>T<br>T<br>T<br>T                                    |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid<br>Sulfamic acid   | M<br>T<br>T  |
| GROUP 3:  | ACIDS, ORGANIC (ALL ISOMERS)<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Oxalic acid   | T<br>T   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butyl alcohol<br>Decanol<br>Ethanol<br>Hexanol<br>Isobutanol<br>Isopropanol<br>Methanol<br>Octanol<br>Propanol   | T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1 |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium carbonate<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide           | T<br>T<br>M<br>T<br>M                                    |
| GROUP 14: | ETHERS<br>Di-butylcyclohexano-18-crown-6-ether   | T1   |
| GROUP 19: | KETONES<br>Acetone<br>Diethyl ketone<br>Diisobutyl ketone<br>Methyl ethyl ketone   | T1<br>T1<br>T1<br>T1                                     |

Argonne National Laboratory - West  
List of Chemicals and Materials  
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Content Code AW 127/227  
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TRU COMBINED SOLID ORGANICS, SOLID INORGANICS, AND SOLIDIFIED INORGANICS

|           |   |   |
|-----------|---|---|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Batteries (Lithium-based)<br>Calcium<br>Cesium<br>Lithium<br>Magnesium<br>Potassium<br>Rubidium<br>Sodium   | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T  |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGE<br>Transuranic elements<br>Zirconium  | T<br>M  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Antimony<br>Cadmium<br>Carbon steel<br>Chromium<br>Copper<br>Iron<br>Filter housings (Metal)<br>Lead<br>Metal cans (Tin)<br>Nichrome heating elements<br>Nickel wire<br>Platinum<br>Selenium<br>Silver pH electrodes<br>Stainless Steel<br>Tantalum<br>Technetium<br>Titanium<br>Zinc<br>Zirconium | M<br>T<br>M<br>D<br>T<br>M<br>D<br>D<br>D<br>M<br>T<br>T<br>M<br>T2<br>T<br>D<br>T<br>T<br>M<br>T2<br>M |

Argonne National Laboratory - West  
List of Chemicals and Materials  
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TRU COMBINED SOLID ORGANICS, SOLID INORGANICS, AND SOLIDIFIED INORGANICS

|            |   |    |
|------------|---|----|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC   |    |
|            | Antimony  | T  |
|            | Arsenic   | T2 |
|            | Barium  | T  |
|            | Beryllium   | T2 |
|            | Cadmium   | M  |
|            | Calcium   | T  |
|            | Chromium  | T  |
|            | Copper  | M  |
|            | Lead  | M  |
|            | Nickel  | M  |
|            | Potassium permanganate  | T2 |
|            | Selenium  | T2 |
|            | Silver  | T2 |
|            | Strontium   | T  |
|            | Titanium  | M  |
|            | Zinc  | T2 |
|            | Zirconium   | M  |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES, AND<br>PHOSPHODITHIOATES<br>CMPO (Organophosphate) | T2 |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS                                    |    |
|            | Beeswax   | M  |
|            | Cellulose   | D  |
|            | Grease  | T  |
|            | Neoprene (Leaded and Non-Leaded)  | D  |
|            | Oil   | M  |
|            | Paint chips (Solidified in Portland Cement)   | D  |
|            | Paper   | D  |
|            | Polyester   | T  |
|            | Polyethylene  | D  |
|            | Polypropylene   | M  |
|            | Polystyrene   | M  |
|            | Polyurethane  | M  |
|            | Polyvinyl chloride  | D  |
|            | Resins (Cation and Anion)   | M  |
|            | Rubber gloves (Leaded)  | D  |
|            | Synthetic rubber  | M  |
|            | Tape (Packaging material)   | M  |
|            | Wood  | M  |
| GROUP 104: | OXIDIZING AGENTS, STRONG  |    |
|            | Potassium permanaganate   | T2 |
|            | Sodium nitrate  | T  |

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TRU COMBINED SOLID ORGANICS, SOLID INORGANICS, AND SOLIDIFIED INORGANICS

|  |   |    |
|--|---|----|
| GROUP 105:                               | REDUCING AGENTS, STRONG   |    |
|  | Calcium   | T  |
|  | Hydroxyl amine  | T  |
|  | Sodium  | T  |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.) |    |
|  | Barium  | T  |
|  | Calcium   | T  |
|  | Hydrobromic acid  | T  |
|  | Lithium   | T  |
|  | Sodium  | T  |
|  | Sulfuric acid   | T  |
| OTHER ORGANICS                           |   |    |
|  | Filter media  | M  |
|  | Hydraulic fluid   | M  |
|  | Lexan (Glovebox windows)  | D  |
|  | Polycarbonate   | M  |
|  | Tetrafluoroethylene (Teflon ®)  | M  |
| OTHER INORGANICS                         |   |    |
|  | Aluminum nitrate  | T  |
|  | Ceramic heating insulators  | M  |
|  | Diamond saw blades  | T  |
|  | Fiberglass (HEPA Filter media)  | M  |
|  | Glass frit  | M  |
|  | Glass labware   | M  |
|  | Grit  | T  |
|  | Lithium chloride  | M  |
|  | Lithium-metaborate fluxes   | T2 |
|  | Potassium chloride  | M  |
|  | Reduced metal alloys (Thermal treatment product)  | M  |
|  | Refractory (Oxides of Al, Si, Cr, Mg)   | M  |
|  | Slag (Oxides of Si, Al, Fe, Ca, Na, K, Mg)  | M  |
|  | Zeolites (Aluminum silicates)   | M  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |    |
|  | Aquaset/Petroset  | D  |
|  | Diatomaceous Earth  | D  |
|  | Oil-Dri   | M  |
|  | Portland Cement (Hydrated)  | D  |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLIDIFIED AQUEOUS WASTE

|           |   |                                 |
|-----------|---|---------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to or concurrent with loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid                    | T<br>M                          |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to or concurrent with loading in payload containers.)<br>Acid residues<br>Nitric acid<br>Sulfuric acid                 | T<br>D<br>T                     |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to or concurrent with loading in payload containers.)<br>Oxalic acid  | T                               |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Ethylene glycol monobutyl ether<br>Isopropanol<br>Methanol<br>Propanol  | T<br>T<br>T<br>T<br>T<br>T<br>T |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to or concurrent with loading in payload containers.)<br>Ammonium hydroxide<br>Caustic residues<br>Sodium carbonate<br>Sodium hydroxide | M<br>T<br>T<br>D                |
| GROUP 14: | ETHERS<br>Ethylene glycol monobutyl ether   | T                               |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to or concurrent with loading in payload containers.)<br>Hydrofluoric acid  | M                               |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Ethyl benzene<br>Instagel (xylene base)<br>Toluene<br>Xylene  | T<br>T<br>T<br>T                |

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SOLIDIFIED AQUEOUS WASTE

|           |  |  |
|-----------|--|--|
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Dichloromethane<br>Ethylene glycol monobutyl ether<br>Methylene chloride<br>Tetrachloroethylene<br>Trichloroethylene   | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T                     |
| GROUP 19: | KETONES<br>Acetone   | T  |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Mercury (vapor)<br>Molybdenum<br>Nickel<br>Selenium  | T<br>T<br>T<br>T   |
| GROUP 23: | METALS, OTHER ELEMENTAL, AND ALLOYS AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Cadmium<br>Chromium<br>Iron<br>Lead<br>Molybdenum<br>Selenium<br>Silver<br>Tantalum   | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T                |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>(Constituents reacted prior to or concurrent with loading in payload containers.)<br>Beryllium<br>Cadmium<br>Chromium<br>Copper salts<br>Lead<br>Mercury<br>Mercury (vapor)<br>Molybdenum<br>Nickel<br>Pyrosulfate salts<br>Selenium<br>Sodium chromate | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T |



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SOLIDIFIED AQUEOUS WASTE

|                |  |   |
|----------------|--|---|
| GROUP 32:      | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Organophosphate<br>Tributyl phosphate<br>Tri-n-octyl phosphine oxide (TOPO)<br>Spent cleansers and detergents  | T<br>T<br>T<br>T                          |
| GROUP 101:     | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Carbon (spent, activated)<br>Mineral spirits<br>Oils<br>Paint<br>Paper<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polyvinyl chloride (Packaging material)<br>Resin | M<br>T<br>T<br>T<br>T<br>M<br>T<br>M<br>T |
| GROUP 104:     | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to or concurrent with loading in payload containers.)<br>Hydrogen peroxide   | T   |
| GROUP 105:     | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to or concurrent with loading in payload containers.)<br>Hydroxyl amine   | T   |
| GROUP 106:     | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Sludge (Fixed in matrix)<br>Water   | T<br>D<br>T                               |
| GROUP 107:     | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to or concurrent with loading in payload containers.)<br>Sulfuric acid  | T   |
| OTHER ORGANICS | Flocculating agent (Polyelectrolyte)   | T   |

Idaho National Engineering and Environmental Laboratory  
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SOLIDIFIED AQUEOUS WASTE

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Aluminum hydroxide                       | T |
| Ammonium bicarbonate                     | T |
| Calcium chloride                         | M |
| Copper carbonate                         | T |
| Fabric softener                          | T |
| Ferrous sulfamate                        | T |
| Firebrick                                | T |
| Glass                                    | T |
| Grit                                     | T |
| Insulation                               | T |
| Iron hydroxide                           | D |
| Molds and Crucibles                      | T |
| Potassium carbonate                      | T |
| Potassium sulfate                        | D |
| Sand                                     | T |
| Sodium hexametaphosphate                 | T |
| Sodium sulfite                           | T |
| Soil                                     | T |
| Soot                                     | T |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Aquaset                                  | M |
| Autodri                                  | D |
| Diatomaceous earth                       | D |
| Diatomite                                | D |
| Dri-Rite                                 | D |
| Ferric sulfate (flocculating agent)      | T |
| Florco                                   | D |
| Nalco 676 (flocculating agent)           | T |
| Oil-Dri                                  | T |
| Polyelectrolyte (flocculating agent)     | T |
| Portland Cement (Hydrated)               | D |
| Sorbal                                   | D |
| Surfactants                              | T |
| Vermiculite                              | M |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLIDIFIED ORGANICS

|            |  |                                 |
|------------|--|---------------------------------|
| GROUP 4:   | ALCOHOLS AND GLYCOLS<br>Polyethylene glycol  | M                               |
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Xylene   | M                               |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Methylene chloride<br>Tetrachloroethylene<br>Trichloroethylene | D<br>M<br>D<br>D<br>M<br>T<br>M |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium   | T                               |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Oil (Absorbed)<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)   | D<br>T<br>T                     |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Water   | T                               |
|            | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Calcium silicate<br>Envirostone (CaSO <sub>4</sub> )<br>Oil-Dri<br>Potassium sulfate<br>Vermiculite  | D<br>D<br>M<br>M<br>T           |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLIDIFIED LABORATORY WASTE

|            |   |                            |
|------------|---|----------------------------|
| GROUP 3:   | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Ascorbic acid<br>Citric acid<br>EDTA<br>Organic acids<br>Oxalic acid   | T<br>T<br>T<br>T<br>M<br>T |
| GROUP 4:   | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isopropanol<br>Methanol   | T<br>T1<br>T1<br>T         |
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Xylene  | T                          |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride                                      | T<br>T<br>T<br>T           |
| GROUP 19:  | KETONES<br>Thenoyl trifluoroacetone (TTA)   | T                          |
| GROUP 23:  | METALS, OTHER ELEMENTAL, AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Cadmium<br>Lead   | T<br>T                     |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Cadmium<br>Lead  | T<br>T                     |
| GROUP 28:  | HYDROCARBON, ALIPHATIC UNSATURATED<br>Polypropylene   | T                          |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate<br>Trioctyl phosphine oxide  | T<br>T                     |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cardboard<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polyvinyl chloride (Packaging material)<br>Resin | T<br>T<br>T<br>T<br>T      |

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## SOLIDIFIED LABORATORY WASTE

|  |  |    |
|--|--|----|
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER              |    |
|  | Aqueous solutions and mixtures (Fixed in matrix) | M  |
|  | Sludge   | D  |
|  | Water  | T  |
| OTHER ORGANICS                           |  |    |
|  | Alpha-hydroxyquinoline                           | T  |
|  | Chelating agents                                 | T  |
|  | 1,10-Phenanthroline                              | T3 |
|  | Sodium acetate                                   | T  |
|  | Sodium citrate                                   | T  |
| OTHER INORGANICS                         |  |    |
|  | Firebrick  | T  |
|  | Glass  | T  |
|  | Insulation                                       | T  |
|  | Molds and Crucibles                              | T  |
|  | Soot   | T  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |  |    |
|  | Concrete   | D  |
|  | Magnesia Cement (Hydrated)                       | D  |
|  | Portland Cement (Hydrated)                       | D  |

Refer to Introduction for a description of the designations used in this chemical list.

Idaho National Engineering and Environmental Laboratory  
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TRU SOLIDIFIED INORGANIC PROCESS SOLIDS

|            |   |                       |
|------------|---|-----------------------|
| GROUP 4:   | ALCOHOLS AND GLYCOLS<br>Butanol<br>Methanol   | T2<br>T2              |
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Toluene<br>Xylene   | T1<br>T1              |
| GROUP 17:  | HALOGENATED ORGANICS<br>Trichloroethylene<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride   | T<br>T<br>T<br>T<br>T |
| GROUP 19:  | KETONES<br>Acetone<br>Methyl ethyl ketone   | T1<br>T1              |
| GROUP 21:  | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Batteries  | T                     |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Graphite<br>Lead<br>Steel<br>Metal debris (Alloys of Fe, Al, Sn, Cu, Ta, W, Ti, Pb, etc.)                                | D<br>T1<br>D<br>D     |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Lead   | T1                    |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulosics (Paper, cardboard, wood, etc.)<br>Plastic<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)<br>Rubber | T<br>T<br>T<br>T<br>T |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Water  | T                     |

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## TRU SOLIDIFIED INORGANIC PROCESS SOLIDS

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Asbestos                                 | M |
| Ash/Pulverized fuel ash                  | D |
| Ceramic                                  | D |
| Fiberglass                               | M |
| Firebrick                                | D |
| Glass                                    | D |
| Grit                                     | D |
| Incombustible material                   | D |
| Insulation                               | D |
| Miscellaneous oxides                     | D |
| Sand                                     | D |
| Slag                                     | D |
| Soil (Incinerated)                       | D |
| Soot                                     | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Concrete                                 | D |
| Oil-Dri                                  | M |
| Portland Cement (Hydrated)               | D |
| Vermiculite                              | M |

Refer to Introduction for a description of the designations used in this chemical list.



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GRAPHITE WASTE

|  |   |                  |
|--|---|------------------|
| GROUP 23:                                | METALS, OTHER ELEMENTAL AND ALLOY, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Graphite (Paint cans)<br>Graphite (Molds and Crucibles)                                       | T<br>D           |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cardboard (Packaging material)<br>Paper<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material) | D<br>T<br>D<br>M |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Oil-Dri<br>Vermiculite  | T<br>M           |

Refer to Introduction for a description of the designations used in this chemical list.

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Content Code ID 116/216

COMBUSTIBLE WASTE

|  |  |   |
|--|--|---|
| GROUP 15:                                | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Sodium fluoride  | T<br>T                                    |
| GROUP 17:                                | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride<br>Trichloroethylene  | T<br>T<br>T<br>T<br>T                     |
| GROUP 21:                                | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Batteries   | T   |
| GROUP 23:                                | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Copper<br>Iron<br>Lead<br>Low carbon steel<br>Stainless Steel  | T<br>T<br>T<br>T<br>M<br>D                |
| GROUP 24:                                | METALS AND METAL COMPOUNDS, TOXIC<br>Copper<br>Lead  | T<br>T                                    |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Paper<br>Polyethylene<br>Polypropylene<br>Polyvinyl chloride<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Wood | D<br>D<br>D<br>D<br>D<br>D<br>M<br>D<br>M |
| OTHER INORGANICS                         | Glass, labware<br>Other filters  | T<br>M                                    |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Concrete<br>Oil-Dri<br>Vermiculite   | D<br>M<br>M                               |

Refer to Introduction for a description of the designations used in this chemical list.

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Idaho National Engineering and Environmental Laboratory  
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Content Code ID 117/217

TRU METAL WASTE

|  |  |  |
|--|--|--|
| GROUP 15:                                | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Sodium fluoride  | T<br>T   |
| GROUP 17:                                | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride   | T<br>T<br>T<br>T   |
| GROUP 19:                                | KETONES<br>Xylene methyl isobutylketone  | T  |
| GROUP 23:                                | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Copper<br>Iron<br>Iron/Tin (alloy)<br>Lead<br>Low carbon steel<br>Platinum<br>Stainless Steel<br>Tantalum<br>Tungsten<br>Zinc/Magnesium (alloy) | D<br>D<br>D<br>D<br>D<br>D<br>M<br>D<br>D<br>D<br>D<br>D |
| GROUP 24:                                | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Copper<br>Lead   | T<br>D<br>D  |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cardboard (Packaging material)<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)<br>Wood   | M<br>D<br>D<br>T   |
| OTHER INORGANICS                         | Calcium sulfate<br>Clay (Bentonite)<br>HEPA Filters<br>Insulation<br>Sodium chloride   | M<br>D<br>D<br>T<br>D                                    |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Oil-Dri<br>Vermiculite   | M<br>M   |

Refer to Introduction for a description of the designations used in this chemical list.

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Idaho National Engineering and Environmental Laboratory  
List of Chemicals and Materials  
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Content Code ID 118/218

TRU GLASS WASTE

|  |   |                       |
|--|---|-----------------------|
| GROUP 2:                                 | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid  | T                     |
| GROUP 17:                                | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride  | T<br>T3<br>T          |
| GROUP 23:                                | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS,<br>MOLDINGS, DROPS , ETC.<br>Aluminum<br>Lead<br>Low Carbon Steel<br>Stainless Steel<br>Tungsten                         | T<br>D<br>M<br>M<br>T |
| GROUP 24:                                | METALS AND METAL COMPOUNDS, TOXIC<br>Lead<br>Mercury  | D<br>T2               |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cardboard (Packaging material)<br>Paper<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material) | M<br>T<br>M<br>M      |
| OTHER INORGANICS                         | Ceramic (Molds and Crucibles)<br>Clay (Bentonite)<br>Glass, labware<br>Glass, raschig rings<br>Sodium chloride  | D<br>D<br>D<br>D<br>D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Oil-Dri<br>Vermiculite  | M<br>D                |

Refer to Introduction for a description of the designations used in this chemical list.

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Content Code ID 119/219

FILTER WASTE

|  |  |                                 |
|--|--|---------------------------------|
| GROUP 2:                                 | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid   | T                               |
| GROUP 10:                                | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Caustic residues   | T                               |
| GROUP 17:                                | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride   | T<br>T<br>T<br>T                |
| GROUP 23:                                | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Stainless Steel   | D<br>T                          |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cloth/Rags<br>Paper<br>Polyethylene<br>Polypropylene (Ful-Flo Filters)<br>Polyvinyl chloride<br>Synthetic rubber<br>Wood | T<br>T<br>M<br>D<br>M<br>T<br>D |
| GROUP 104:                               | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrates   | T                               |
| OTHER INORGANICS                         | Asbestos<br>Fiberglass<br>HEPA Filters (Or filter media)<br>Insulation<br>Other filters<br>Plenum Prefilters (Fiberglass)  | M<br>M<br>D<br>D<br>D<br>D      |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Oil-Dri<br>Portland Cement (Hydrated)  | D<br>M                          |

Refer to Introduction for a description of the designations used in this chemical list.

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Content Code ID 121/221

TRU ORGANIC SOLID WASTE

|            |   |   |
|------------|---|---|
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Toluene<br>Xylene   | T1<br>T1  |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>1,1,1-Trichloroethane<br>Carbon tetrachloride<br>Methylene chloride<br>Trichloroethylene   | T<br>T<br>T<br>T<br>T   |
| GROUP 19:  | KETONES<br>Acetone<br>Methyl ethyl ketone   | T1<br>T1  |
| GROUP 21:  | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Batteries  | T   |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Iron<br>Metal Debris (Metals and Alloys of Fe, Al, Sn, Cu, Ta, W, Ti, Pb, etc.)<br>Lead<br>Stainless Steel  | T<br>M<br>D<br>M  |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Lead   | D   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Asphalt<br>Benelex<br>Cardboard<br>Cellulosics (paper, cardboard, wood, etc.)<br>Leaded rubber<br>Paper<br>Phenolic resins<br>Plastic<br>Plexiglas<br>Polyethylene<br>Polymethyl methacrylate<br>Polyvinyl chloride<br>Rubber<br>Synthetic rubber<br>Wood | D<br>D<br>D<br>D<br>D<br>D<br>T<br>D<br>D<br>D<br>D<br>T<br>D<br>T<br>D |

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List of Chemicals and Materials  
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Content Code ID 121/221  
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## TRU ORGANIC SOLID WASTE

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Asbestos                                 | M |
| Ceramic                                  | T |
| Crucibles                                | M |
| Fiberglass                               | M |
| Fly ash                                  | M |
| Glass                                    | T |
| HEPA Filters (Or other filters)          | D |
| Sand                                     | D |
| Slag                                     | M |
| Soil                                     | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Concrete                                 | D |
| Oil-Dri                                  | M |
| Portland Cement                          | M |
| Vermiculite                              | M |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU SOLID INORGANIC WASTE

|            |  |                                 |
|------------|--|---------------------------------|
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Toluene<br>Xylenes   | T1<br>T1                        |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride<br>Trichloroethylene  | T<br>T<br>T<br>T<br>T           |
| GROUP 19:  | KETONES<br>Acetone<br>Methyl ethyl ketone  | T1<br>T1                        |
| GROUP 21:  | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Batteries   | M                               |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Copper<br>Graphite<br>Iron<br>Iron/Tin (Alloy)<br>Metal Debris (Metals and Alloys of Fe, Al, Sn, Cu, Ta, W, Ti, Pb, etc.)<br>Tin<br>Titanium                       | T<br>D<br>T<br>M<br>D<br>T<br>T |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Copper<br>Titanium  | T<br>T                          |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cardboard (Packaging material)<br>Cellulosics (paper, cardboard, wood, etc.)<br>Paper<br>Plastic<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)<br>Rubber | D<br>T<br>T<br>T<br>M<br>M<br>T |

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(Continued)

## TRU SOLID INORGANIC WASTE

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Asbestos                                 | M |
| Ash                                      | D |
| Crucibles, Ceramic (Silicate-based)      | D |
| Fiberglass                               | M |
| Firebrick                                | D |
| Glass                                    | D |
| Grit                                     | D |
| Incombustible material                   | D |
| Insulation                               | D |
| Miscellaneous oxides                     | D |
| Sand                                     | D |
| Slag                                     | D |
| Soil/Gravel                              | D |
| Soot                                     | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Concrete                                 | M |
| Oil-Dri                                  | M |
| Vermiculite                              | M |

Refer to Introduction for a description of the designations used in this chemical list.

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LEADED RUBBER

|            |  |             |
|------------|--|-------------|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Lead (Rubber gloves)  | D           |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Polyethylene<br>Polyvinyl chloride<br>Rubber gloves (Leaded) | M<br>T<br>D |
|            | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Oil-Dri<br>Vermiculite   | T<br>M      |

Refer to Introduction for a description of the designations used in this chemical list.

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List of Chemicals and Materials  
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Content Code ID 124/224

PYROCHEMICAL SALT WASTE

|            |   |                            |
|------------|---|----------------------------|
| GROUP 10:  | CAUSTICS<br>(Constituents dispersed in chloride salts.)<br>Calcium oxide  | M                          |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Iron/Tin (Alloy)<br>Metal cans (For salt)                      | M<br>M                     |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Magnesium oxide  | T1                         |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Paper<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)     | T<br>M<br>M                |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents dispersed in chloride salts.)<br>Calcium oxide   | M                          |
|            | OTHER INORGANICS<br>Calcium chloride<br>Cesium chloride<br>Magnesium chloride<br>Potassium chloride<br>Salt (Fused Chloride)<br>Sodium chloride | D<br>D<br>D<br>D<br>D<br>D |
|            | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Oil-Dri<br>Vermiculite  | T<br>M                     |

Refer to Introduction for a description of the designations used in this chemical list.

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INEEL STORED TRU COMBUSTIBLE AND NONCOMBUSTIBLE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid   | T   |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid   | T   |
| GROUP 15: | FLUORIDES, INORGANIC<br>Calcium fluoride<br>Sodium fluoride  | T<br>T  |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Xylene   | T   |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride   | T<br>T<br>T<br>T                                    |
| GROUP 18: | ISOCYANATES<br>Ammonium thiocyanate  | T   |
| GROUP 19: | KETONES<br>Xylene methyl isobutyl ketone   | T   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS OR SPONGES<br>Aluminum  | D   |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Copper<br>Iron<br>Iron/Tin (Alloy)<br>Lead<br>Low carbon steel<br>Platinum<br>Stainless Steel<br>Tantalum<br>Tungsten<br>Zinc/Magnesium (Alloy) | D<br>D<br>D<br>D<br>D<br>M<br>D<br>D<br>D<br>D<br>D |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Copper<br>Lead   | T<br>D<br>D   |

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INEEL STORED TRU COMBUSTIBLE AND NONCOMBUSTIBLE WASTE

|  |  |   |
|--|--|---|
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS   |   |
|  | Bakelite   | T |
|  | Cardboard (Packaging material)   | M |
|  | Cloth  | M |
|  | Neoprene   | M |
|  | Oil  | T |
|  | Paper  | T |
|  | Polyethylene (Packaging material)  | D |
|  | Polypropylene  | T |
|  | Polyvinyl chloride (Packaging material)  | D |
|  | Rubber gloves  | D |
|  | Rubber gloves (Leaded)   | M |
|  | Synthetic rubber   | M |
|  | Wood   | T |
| GROUP 104:                               | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.) |   |
|  | Nitrates   | T |
| OTHER INORGANICS                         |  |   |
|  | Calcium sulfate  | M |
|  | Clay (Bentonite)   | D |
|  | Glass, labware   | D |
|  | Glass, raschig rings   | D |
|  | HEPA Filters   | M |
|  | Insulation   | T |
|  | Sodium chloride  | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |  |   |
|  | Oil-Dri  | M |
|  | Vermiculite  | M |

Refer to Introduction for a description of the designations used in this chemical list.

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Content Code ID 126/226

CEMENTED PROCESS SOLIDS

|            |  |                                 |
|------------|--|---------------------------------|
| GROUP 4:   | ALCOHOLS AND GLYCOLS<br>Butanol<br>Methanol  | T2<br>T2                        |
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Toluene<br>Xylene  | T1<br>T1                        |
| GROUP 17:  | HALOGENATED ORGANICS<br>Trichloroethylene<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride                              | T<br>T<br>T<br>T<br>T           |
| GROUP 19:  | KETONES<br>Acetone<br>Methyl ethyl ketone  | T1<br>T1                        |
| GROUP 21:  | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Batteries   | T                               |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Iron/Tin (Alloy)<br>Lead<br>Metal debris (Alloys of Fe, Al, Sn, Cu, Ta, W, Ti, Pb, etc.)                 | M<br>T1<br>M                    |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Lead  | T1                              |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulosics (Paper, cardboard, wood, etc.)<br>Leaded rubber<br>Plastic<br>Polyethylene<br>Polyvinyl chloride<br>Resins<br>Rubber | D<br>D<br>D<br>D<br>M<br>D<br>D |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Water   | T                               |

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## CEMENTED PROCESS SOLIDS

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Asbestos                                 | M |
| Ceramic                                  | T |
| Fiberglass                               | M |
| Firebrick                                | D |
| Glass                                    | T |
| Grit                                     | D |
| HEPA Filters                             | D |
| Other filters                            | T |
| Pulverized fuel ash                      | D |
| Sand                                     | D |
| Slag                                     | D |
| Soot                                     | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Oil-Dri                                  | M |
| Portland Cement (Hydrated)               | D |
| Vermiculite                              | M |

Refer to Introduction for a description of the designations used in this chemical list.

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Content Code ID 127/227

COMBINED SOLID ORGANICS, SOLID INORGANICS, AND SOLIDIFIED INORGANICS

This Content Code was created by combining other TRU Waste Content Codes. The List of Chemicals and Materials for Content Code ID 127/227 is a combination of the individual List of Chemicals and Materials for the following Content Codes:

|            |            |
|------------|------------|
| ID 111/211 | ID 119/219 |
| ID 114/214 | ID 121/221 |
| ID 115/215 | ID 122/222 |
| ID 116/216 | ID 123/223 |
| ID 117/217 | ID 124/224 |
| ID 118/218 | ID 125/225 |
| ID 126/226 |            |

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Content Code ID 130/230

SOLID INORGANIC WITH RESIDUAL ORGANIC WASTE\*

|            |  |  |
|------------|--|--|
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Toluene<br>Xylenes   | T1<br>T1                                       |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride<br>Trichloroethylene                  | T<br>T<br>T<br>T<br>T                          |
| GROUP 19:  | KETONES<br>Acetone<br>Methyl ethyl ketone  | T1<br>T1                                       |
| GROUP 21:  | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Batteries   | T  |
| GROUP 23:  | METALS, OTHER ELEMENTAL, AND ALLOW, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Copper<br>Iron<br>Iron alloys<br>Lead<br>Tantalum<br>Tin<br>Titanium<br>Tungsten | D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Copper<br>Lead<br>Titanium  | D<br>D<br>D                                    |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELIANEOUS<br>Cellulosics (Paper, cardboard, wood, etc.)<br>Plastic<br>Rubber  | M<br>M<br>M                                    |

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Content Code ID 130/230  
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SOLID INORGANIC WITH RESIDUAL ORGANIC WASTE\*

|  |   |
|--|---|
| OTHER INORGANIC                          |   |
| Asbestos                                 | M |
| Ceramic                                  | D |
| Crucible                                 | D |
| Fiberglass                               | M |
| Firebrick                                | D |
| Glass                                    | D |
| Graphite                                 | D |
| Grit                                     | D |
| Insulation                               | D |
| Miscellaneous oxides                     | D |
| Sand                                     | D |
| Slag                                     | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Concrete                                 | D |
| Oil-Dri                                  | M |
| Vermiculite                              | M |

Refer to introduction for a description of the designations used in this chemical list.

\*The sum of the concentrations of water and organic materials must be less than or equal to 10 weight percent of the total waste.

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Content Code LA 111/211

TRU SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLIDS

|           |   |  |
|-----------|---|--|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid  | T2<br>T2<br>T2                                   |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid<br>Sulfuric acid (<70%)   | T2<br>T2<br>T2                                   |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Oxalic acid   | T2   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol  | T2<br>T3<br>T2                                   |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Barium hydroxide<br>Beryllium hydroxide<br>Calcium carbonate<br>Calcium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide | T2<br>T3<br>T2<br>M<br>T<br>T1<br>T2<br>T2<br>T2 |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Calcium fluoride<br>Hydrofluoric acid<br>Potassium fluoride  | T2<br>T1<br>T2<br>T2                             |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>Bromoform<br>Carbon tetrachloride<br>Dichloroethane<br>Trichloroethylene   | T2<br>T2<br>T2<br>T2<br>T2                       |
| GROUP 19: | KETONES<br>Acetone<br>Methyl ethyl ketone   | T3<br>T3   |

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(Continued)

TRU SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLIDS

|            |  |  |
|------------|--|--|
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Cadmium<br>Graphite (Molds and Crucibles)<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum   | T2<br>T<br>T3<br>T1<br>T3<br>T2                                    |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Barium chloride<br>Barium hydroxide<br>Beryllium<br>Beryllium hydroxide<br>Cadmium<br>Lead<br>Mercury  | T2<br>T3<br>T3<br>T2<br>T2<br>T2<br>T1<br>T2                       |
| GROUP 27:  | NITRO COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrocellulose<br>Urea nitrate  | T2<br>T2   |
| GROUP 28:  | HYDROCARBON, ALIPHATIC, UNSATURATED<br>Polypropylene (Ful-Flo Filters)   | T  |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED<br>Oils (C6 to C20)  | T2   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Grease<br>Methyl acetone<br>Oil<br>Polyethylene (Packaging material)<br>Polypropylene (Ful-Flo Filters)<br>Polyvinyl chloride (Packaging material)<br>Resins<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Wood | T1<br>T2<br>T3<br>T2<br>T1<br>T<br>T1<br>T1<br>T2<br>T<br>T2<br>T2 |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium nitrate<br>Nitrocellulose<br>Urea nitrate   | T<br>T2<br>T2  |

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TRU SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLIDS

|  |  |   |
|--|--|---|
| GROUP 104:                               | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide<br>Other nitrate salts<br>Sodium nitrate<br>Urea nitrate | T2<br>M<br>D<br>T2  |
| GROUP 105:                               | REDUCING AGENTS, STRONG<br>Hydroxyl amine  | T   |
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T1<br>T1  |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>Sulfuric acid (>70%)                                     | T1<br>T2  |
| OTHER INORGANICS                         | Ash<br>Ferric hydroxide<br>Firebrick<br>Glass, labware<br>Grit<br>Insulation<br>Magnesium hydroxide<br>Ceramic (Molds and Crucibles)<br>Salt<br>Sand<br>Slag<br>Soot     | M<br>D<br>T1<br>T<br>T1<br>T2<br>D<br>T<br>T1<br>T1<br>T1<br>T2 |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Calcium silicate (Water glass - Na silicate)<br>Envirostone<br>Oxalate salts<br>Perlite<br>Portland Cement (Hydrated)<br>Surfactants<br>Vermiculite                      | M<br>D<br>M<br>M<br>D<br>T1<br>M                                |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLIDIFIED ORGANIC WASTE

|           |   |  |
|-----------|---|--|
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Methanol<br>Ethanol<br>Propanol<br>Butanol<br>Polyethylene glycol   | T2<br>T1<br>T2<br>T2<br>T                                      |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Benzene<br>Toluene<br>Xylene  | T2<br>T2<br>T2   |
| GROUP 17: | HALOGENATED ORGANICS<br>PCB<br>1,1,1-Trichloroethane<br>Carbon tetrachloride<br>Trichloroethylene   | T<br>T1<br>T2<br>D   |
| GROUP 19: | KETONES<br>Acetone  | T2   |
| GROUP 23: | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS,<br>MOULDINGS, DROPS, ETC.<br>Cadmium<br>Chromium<br>Lead<br>Nickel<br>Selenium<br>Silver             | T2<br>T2<br>T2<br>T2<br>T2<br>T2                               |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Barium<br>Beryllium<br>Cadmium<br>Chromium<br>Lead<br>Mercury<br>Nickel<br>Selenium<br>Silver<br>Thallium | T2<br>T2<br>T2<br>T2<br>T2<br>T2<br>T2<br>T2<br>T2<br>T2<br>T2 |
| GROUP 29: | HYDROCARBON, ALIPHATIC, SATURATED<br>Oils (C6 to C20) (Absorbed)  | D  |

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## SOLIDIFIED ORGANIC WASTE

|                  |  |                  |
|------------------|--|------------------|
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Oils (C6 to C20) (Absorbed)<br>Polyethylene (Packaging material)<br>Polyethylene glycol<br>Polyvinyl chloride (Packaging material) | D<br>M<br>T<br>M |
| GROUP 106:       | WATER AND MIXTURES CONTAINING WATER<br>Water   | T                |
| OTHER ORGANICS   | Nochar Petro Bond N990 (or equivalent)<br>Nochar Petro Bond N910 (or equivalent)   | D<br>D           |
| OTHER INORGANICS | Vermiculite  | D                |

Refer to Introduction for a description of the designations used in this chemical list.



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TRU SOLIDIFIED INORGANIC PROCESS SOLIDS

|           |   |  |
|-----------|---|--|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid  | T2<br>T2<br>T2                                   |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid<br>Sulfuric acid (<70%)   | T2<br>T2<br>T2                                   |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Oxalic acid   | T2   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol  | T2<br>T3<br>T2                                   |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Barium hydroxide<br>Beryllium hydroxide<br>Calcium hydroxide<br>Calcium carbonate<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide | T2<br>T3<br>T2<br>T<br>M<br>T1<br>T2<br>T2<br>T2 |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Calcium fluoride<br>Hydrofluoric acid<br>Potassium fluoride  | T2<br>T1<br>T2<br>T2                             |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>Bromoform<br>Carbon tetrachloride<br>Dichloroethane<br>Trichloroethylene   | T2<br>T2<br>T2<br>T2<br>T2                       |
| GROUP 19: | KETONES<br>Acetone<br>Methyl ethyl ketone   | T3<br>T3   |

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TRU SOLIDIFIED INORGANIC PROCESS SOLIDS

|            |  |  |
|------------|--|--|
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Cadmium<br>Iron<br>Graphite (Molds and Crucibles)<br>Lead<br>Stainless Steel<br>Tantalum   | T2<br>T3<br>T<br>T1<br>T3<br>T2                                    |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Barium chloride<br>Barium hydroxide<br>Beryllium<br>Beryllium hydroxide<br>Cadmium<br>Lead<br>Mercury  | T2<br>T3<br>T3<br>T2<br>T2<br>T2<br>T1<br>T2                       |
| GROUP 27:  | NITRO COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrocellulose<br>Urea nitrate  | T2<br>T2   |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED<br>Oils (C6 to C20)  | T2   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Grease<br>Methyl acetone<br>Oil<br>Polyethylene (Packaging material)<br>Polypropylene (Ful-Flo Filters)<br>Polyvinyl chloride (Packaging material)<br>Resins<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Wood | T1<br>T2<br>T3<br>T2<br>T1<br>T<br>T1<br>T1<br>T2<br>T<br>T2<br>T2 |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium nitrate<br>Nitrocellulose<br>Urea nitrate   | T<br>T2<br>T2  |

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TRU SOLIDIFIED INORGANIC PROCESS SOLIDS

|  |  |   |
|--|--|---|
| GROUP 104:                               | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide<br>Other nitrate salts<br>Sodium nitrate<br>Urea nitrate | T2<br>M<br>D<br>T2  |
| GROUP 105:                               | REDUCING AGENTS, STRONG<br>Hydroxyl amine  | T2  |
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T1<br>T1  |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>Sulfuric acid  | T1<br>T2  |
| OTHER INORGANICS                         | Ash<br>Ferric hydroxide<br>Firebrick<br>Glass, labware<br>Grit<br>Insulation<br>Magnesium hydroxide<br>Ceramic (Molds and Crucibles)<br>Salt<br>Sand<br>Slag<br>Soot     | M<br>D<br>T1<br>T<br>T1<br>T2<br>D<br>T<br>T1<br>T1<br>T1<br>T2 |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Calcium silicate (Water glass - Na silicate)<br>Oxalate salts<br>Perlite<br>Portland Cement (Hydrated)<br>Surfactants<br>Vermiculite                                     | M<br>M<br>M<br>D<br>T1<br>M                                     |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU GRAPHITE WASTE

|                  |   |  |
|------------------|---|--|
| GROUP 22:        | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Mercury (Vapor)<br>Nickel<br>Zirconium   | T1<br>T2<br>T2<br>T2                                   |
| GROUP 23:        | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Copper<br>Graphite (Molds and Crucibles)<br>Iron<br>Lead<br>Metal cans<br>Stainless Steel<br>Tantalum<br>Zirconium | T1<br>T2<br>T1<br>D<br>T2<br>T2<br>D<br>T1<br>T1<br>T2 |
| GROUP 24:        | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Beryllium hydroxide<br>Cadmium<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Zirconium   | T2<br>T2<br>T2<br>T2<br>T1<br>T2<br>T2<br>T2<br>T2     |
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Bakelite<br>Benelex<br>Plexiglas<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polyvinyl chloride (Packaging material)                                 | T1<br>T1<br>T1<br>T1<br>T1<br>T1                       |
| OTHER INORGANICS | Ash<br>Firebrick<br>Glass, labware<br>Grit<br>Slag<br>Soot  | T1<br>T<br>T1<br>T1<br>T1<br>T1                        |

Refer to Introduction for a description of the designations used in this chemical list.

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COMBUSTIBLE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Boric acid<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid   | T2<br>T2<br>T1<br>T1<br>T2                        |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid  | T1<br>T2  |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Ascorbic acid<br>Citric acid<br>EDTA<br>Oxalic acid   | T2<br>T<br>T<br>T2<br>T1                          |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol   | T1<br>T2<br>T2                                    |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Barium hydroxide<br>Beryllium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide<br>Sodium hypochlorite | T2<br>T2<br>T1<br>T<br>T1<br>T1<br>T1<br>T1<br>T2 |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Hydrofluoric acid<br>Potassium fluoride  | T<br>T2<br>T2                                     |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Toluene  | T2  |

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## COMBUSTIBLE WASTE

|           |  |  |
|-----------|--|--|
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>Bromoform<br>Carbon tetrachloride<br>Dichloromethane<br>Trichloroethylene   | T1<br>T2<br>T2<br>T2<br>T1                               |
| GROUP 19: | KETONES<br>Acetone<br>Thenoyl trifluoroacetone (TTA)   | T2<br>T  |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Mercury (Vapor)<br>Nickel<br>Zirconium   | D<br>T2<br>T2<br>T2                                      |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Copper<br>Graphite (Molds and Crucibles)<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum<br>Zirconium | D<br>T2<br>T2<br>T1<br>D<br>T2<br>D<br>T2<br>T2          |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Barium chloride<br>Barium hydroxide<br>Beryllium<br>Beryllium hydroxide<br>Cadmium<br>Copper<br>Lead<br>Mercury<br>Zirconium                                 | T2<br>T2<br>T2<br>T2<br>T1<br>T2<br>T2<br>T2<br>T2<br>T2 |
| GROUP 25: | NITRIDES<br>(Constituents reacted prior to loading in payload containers.)<br>Sodium nitride   | T1   |
| GROUP 27: | NITRO COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrocellulose  | T1   |



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## COMBUSTIBLE WASTE

|            |  |   |
|------------|--|---|
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate   | T1  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Bakelite<br>Benelex<br>Carbon (Spent, Activated)<br>Cellulose<br>Grease<br>Oil<br>Paper<br>Plexiglas<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride<br>Resins<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Waxes<br>Wood | M<br>T<br>T<br>D<br>T1<br>T<br>D<br>T<br>D<br>M<br>T<br>M<br>D<br>T<br>M<br>M<br>M<br>T1<br>M |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium nitrate<br>Nitrocellulose   | T2<br>T2  |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium perchlorate<br>Bromine<br>Hydrogen peroxide<br>Sodium hypochlorite<br>Sodium nitrate  | T2<br>T2<br>T2<br>T2<br>T1  |
| GROUP 105: | REDUCING AGENTS, STRONG<br>Hydroxyl amine  | T1  |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T1<br>T1  |

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## COMBUSTIBLE WASTE

|   |  |
|---|--|
| GROUP 107: WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Aluminum chloride<br>Calcium oxide<br>Hydrobromic acid          | T2<br>T<br>T2  |
| OTHER INORGANICS<br>Ash<br>Ceramic (Molds and Crucibles)<br>Firebrick<br>Glass, labware<br>Grit<br>Insulation<br>Other filters<br>Salt (Nitrates)<br>Sand<br>Slag<br>Soot | M<br>D<br>T1<br>D<br>T1<br>T1<br>T1<br>T1<br>M<br>T1<br>T2 |
| OTHER ORGANICS<br>Polyvinylidene fluoride   | M  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Emulsifiers<br>Envirostone<br>Surfactants<br>Vermiculite  | T2<br>T1<br>T2<br>T2                                       |

Refer to Introduction for a description of the designations used in this chemical list.

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METAL WASTE

|           |   |  |
|-----------|---|--|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid  | T2<br>T2<br>T2<br>T2                   |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid<br>Sulfuric acid (<70%)   | T2<br>T2<br>T2                         |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Oxalic acid  | T2<br>T2                               |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol  | T2<br>T2<br>T2                         |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Barium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide<br>Sodium hypochlorite | T2<br>T2<br>T2<br>T2<br>T2<br>T2<br>T2 |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Hydrofluoric acid<br>Potassium fluoride   | T2<br>T2<br>T2                         |
| GROUP 17: | HALOGENATED ORGANICS<br>Carbon tetrachloride  | T2                                     |
| GROUP 19: | KETONES<br>Acetone<br>Methyl isobutyl ketone  | T2<br>T2                               |

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METAL WASTE

|            |  |   |
|------------|--|---|
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Copper<br>Iron<br>Lead<br>Stainless Steel  | D<br>T<br>D<br>T<br>D   |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Barium chloride<br>Barium hydroxide<br>Copper<br>Lead   | T2<br>T2<br>T<br>T  |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND PHOSPHODITHIOATES<br>Tributyl phosphate  | T2  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Bakelite<br>Grease<br>Oil<br>Paper<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride (Packaging material)<br>Resins<br>Rubber gloves<br>Synthetic rubber<br>Waxes<br>Wood | T2<br>T2<br>T2<br>T<br>T<br>T2<br>T2<br>T2<br>T<br>T2<br>T2<br>T2<br>T2<br>T2 |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium perchlorate<br>Bromine<br>Sodium nitrate  | T2<br>T2<br>T2  |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T2<br>T2  |

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METAL WASTE

|  |   |    |
|--|---|----|
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.) |    |
|  | Aluminum chloride   | T2 |
|  | Calcium oxide   | T2 |
|  | Hydrobromic acid  | T2 |
|  | Sulfuric acid (>70%)  | T2 |
| OTHER INORGANICS                         |   |    |
|  | Ceramic (Molds and Crucibles)   | T  |
|  | Glass, labware  | D  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |    |
|  | Portland Cement (Hydrated)  | T1 |
|  | Vermiculite   | T1 |

Refer to Introduction for a description of the designations used in this chemical list.

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GLASS WASTE

|           |   |  |
|-----------|---|--|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid  | T2<br>T2<br>T2<br>T2                   |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid<br>Sulfuric acid (<70%)   | T2<br>T2<br>T2                         |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Oxalic acid  | T2<br>T2                               |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol  | T2<br>T2<br>T2                         |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Barium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide<br>Sodium hypochlorite | T2<br>T2<br>T2<br>T2<br>T2<br>T2<br>T2 |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Hydrofluoric acid<br>Potassium fluoride   | T2<br>T2<br>T2                         |
| GROUP 17: | HALOGENATED ORGANICS<br>Carbon tetrachloride  | T2                                     |
| GROUP 19: | KETONES<br>Acetone<br>Methyl isobutyl ketone  | T2<br>T2                               |

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## GLASS WASTE

|            |  |   |
|------------|--|---|
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Copper<br>Iron<br>Lead<br>Stainless Steel  | D<br>T<br>D<br>T<br>D   |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Barium chloride<br>Barium hydroxide<br>Copper<br>Lead   | T2<br>T2<br>T<br>T  |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND PHOSPHODITHIOATES<br>Tributyl phosphate  | T2  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Bakelite<br>Grease<br>Oil<br>Paper<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride (Packaging material)<br>Resins<br>Rubber gloves<br>Synthetic rubber<br>Waxes<br>Wood | T2<br>T2<br>T2<br>T<br>T<br>T2<br>T2<br>T2<br>T<br>T2<br>T2<br>T2<br>T2<br>T2 |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium perchlorate<br>Bromine<br>Sodium nitrate  | T2<br>T2<br>T2  |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T2<br>T2  |



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(Continued)

GLASS WASTE

|  |   |    |
|--|---|----|
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.) |    |
|  | Aluminum chloride   | T2 |
|  | Calcium oxide   | T2 |
|  | Hydrobromic acid  | T2 |
|  | Sulfuric acid (>70%)  | T2 |
| OTHER INORGANICS                         |   |    |
|  | Ash   | M  |
|  | Ceramic (Molds and Crucibles)   | T  |
|  | Glass, labware  | D  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |    |
|  | Portland Cement (Hydrated)  | T1 |
|  | Vermiculite   | T1 |

Refer to Introduction for a description of the designations used in this chemical list.

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FILTER WASTE

|           |  |                                      |
|-----------|--|--------------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Boric acid<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid  | T2<br>T3<br>T1<br>T1                 |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)   | T1<br>T2                             |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Ascorbic acid<br>EDTA<br>Oxalic acid  | T2<br>T1<br>T<br>T1                  |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Beryllium hydroxide<br>Calcium hydroxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide<br>Sodium hypochlorite | T2<br>T1<br>T<br>T1<br>T<br>T1<br>T2 |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Hydrofluoric acid  | T<br>T2                              |
| GROUP 19: | KETONES<br>Thenoyl trifluoroacetone (TTA)  | T3                                   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Nickel   | T3                                   |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Lead<br>Plenum Prefilters (Stainless Steel)<br>Tantalum  | D<br>T2<br>T2<br>D<br>T3             |

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FILTER WASTE

|            |  |   |
|------------|--|---|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Beryllium hydroxide<br>Cadmium<br>Lead<br>Nickel   | T1<br>T3<br>T2<br>T2<br>T3                          |
| GROUP 25:  | NITRIDES<br>(Constituents reacted prior to loading in payload containers.)<br>Sodium nitride   | T2  |
| GROUP 27:  | NITRO COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrocellulose  | T2  |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate<br>Trioctyl phosphine oxide   | T1<br>T2  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Carbon (Spent, Activated)<br>Cellulose<br>Filters (Plastic)<br>Oil<br>Paper<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)<br>Synthetic rubber<br>Waxes<br>Wood | T1<br>T1<br>D<br>T1<br>T1<br>M<br>M<br>M<br>T1<br>D |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium nitrate<br>Nitrocellulose   | T2<br>T2  |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Sodium hypochlorite<br>Sodium nitrate  | T2<br>T1  |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T1<br>T   |

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FILTER WASTE

|                  |  |    |
|------------------|--|----|
| GROUP 107:       | WATER REACTIVE SUBSTANCES                                      |    |
|                  | (Constituents reacted prior to loading in payload containers.) |    |
|                  | Aluminum chloride  | T2 |
|                  | Calcium oxide  | T  |
|                  | Hydrobromic acid   | T3 |
|                  | Sulfuric acid (>70%)   | T2 |
| OTHER INORGANICS |  |    |
|                  | Ash  | T1 |
|                  | Cement powder (Portland Cement or Envirostone)                 | T1 |
|                  | Grit   | T1 |
|                  | HEPA Filters (Or filter media)                                 | T1 |
|                  | Insulation   | T1 |
|                  | Salt (Nitrates)  | T1 |
|                  | Soot   | T2 |
|                  | Vermiculite  | T1 |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU ISOTOPIC SOURCE WASTE

|           |  |  |
|-----------|--|--|
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Sodium oxide   | T  |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Magnesium<br>Potassium<br>Sodium   | T<br>T<br>T<br>T   |
| GROUP 22: | METALS OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Aluminum<br>Americium<br>Cobalt<br>Bismuth<br>Beryllium<br>Molybdenum<br>Manganese<br>Nickel  | D<br>D<br>T<br>T<br>T<br>T<br>T<br>T   |
| GROUP 23: | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Americium (Foil, wire)<br>Aluminum<br>Bismuth<br>Boron<br>Cadmium<br>Chromium<br>Cobalt<br>Copper<br>Hastelloy-C<br>Iron<br>Lead<br>Manganese<br>Molybdenum<br>Platinum<br>Silicon<br>Stainless Steel<br>Steel | D<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>D<br>D |

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TRU ISOTOPIC SOURCE WASTE

|            |   |  |
|------------|---|--|
| GROUP 23:  | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS, MOLDINGS, DROPS, ETC. (Continued)<br>Tungsten<br>Tungsten (Alloy)<br>Titanium<br>Tin<br>Tantalum<br>Zirconium<br>Zinc                    | <br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>T                               |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Bismuth<br>Cadmium<br>Calcium<br>Chromium<br>Cobalt<br>Copper<br>Lead<br>Manganese<br>Molybdenum<br>Nickel<br>Titanium<br>Zinc<br>Zirconium | <br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>D<br>T<br>D |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Grease<br>Nitrile rubber gloves<br>Paper<br>Polyethelene<br>Polypropylene<br>Polyvinyl chloride<br>Synthetic rubber<br>Wood             | <br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T                               |
| GROUP 105: | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Sodium  | <br><br>T<br>T   |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Potassium<br>Sodium oxide<br>Sodium   | <br><br>T<br>T<br>T<br>T   |



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## TRU ISOTOPIC SOURCE WASTE

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Americium oxide                          | D |
| Beryllium windows                        | T |
| Ceramic                                  | D |
| Cesium in glass                          | D |
| Filter media (Inorganic)                 | D |
| Magnesium oxide                          | D |
| Glass, labware                           | D |
| Plutonium oxide                          | D |
| Sand                                     | D |
| Soil                                     | D |
| Silicon oxide                            | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Vermiculite                              | D |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLID INORGANIC WASTE

|                  |  |              |
|------------------|--|--------------|
| GROUP 1:         | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading the payload containers)<br>Hydrofluoric acid               | T3           |
| GROUP 2:         | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading the payload containers)<br>Nitric acid                         | T            |
| GROUP 4:         | ALCOHOLS AND GLYCOLS<br>Ethanol  | T3           |
| GROUP 10:        | CAUSTICS<br>(Constituents reacted prior to loading the payload containers)<br>Potassium hydroxide                                  | T3           |
| GROUP 15:        | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading the payload containers)<br>Hydrofluoric acid                        | T3           |
| GROUP 23:        | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Tin (Inner packaging)                             | D            |
| GROUP 27:        | NITRO COMPOUNDS<br>Nitrocellulose  | T3           |
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material) | M<br>M       |
| GROUP 102:       | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrocellulose                                     | T3           |
| OTHER INORGANICS | Ash<br>Borosilicate glass<br>Ferric nitrate  | D<br>D<br>T3 |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU LEADED RUBBER WASTE AND TRU METAL

|           |  |                |
|-----------|--|----------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid | T1<br>T1<br>T2 |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)                           | T1<br>T2       |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Oxalic acid  | T2             |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Methanol<br>Polyethylene glycol   | T2<br>T2<br>T2 |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Beryllium hydroxide<br>Potassium hydroxide<br>Sodium hydroxide                 | T1<br>T1<br>T1 |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Hydrofluoric acid<br>Potassium fluoride        | T1<br>T1<br>T2 |
| GROUP 17: | HALOGENATED ORGANICS<br>Bromoform<br>Carbon tetrachloride<br>Dichloromethane   | T2<br>T2<br>T2 |
| GROUP 19: | KETONES<br>Methyl ethyl ketone   | T2             |
| GROUP 21: | METAL, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Batteries (Alkaline)   | T1             |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Mercury (Vapor)<br>Nickel<br>Zirconium                                      | T2<br>T2<br>T2 |

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TRU LEADED RUBBER WASTE AND TRU METAL

|            |  |  |
|------------|--|--|
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Copper<br>Graphite (Molds and Crucibles)<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum<br>Zirconium  | M<br>T1<br>T<br>T1<br>D<br>M<br>D<br>M<br>T2                               |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium hydroxide<br>Cadmium<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Zirconium   | T2<br>T1<br>T1<br>T<br>M<br>T2<br>T2<br>T2                                 |
| GROUP 27:  | NITRO COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrocellulose  | T2   |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND PHOSPHODITHIOATES<br>Tributyl phosphate  | T1   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Bakelite<br>Benelex<br>Carbon (Spent, Activated)<br>Cellulose<br>Grease<br>Oil<br>Paper<br>Plexiglas<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride | T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1 |

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TRU LEADED RUBBER WASTE AND TRU METAL

|  |  |   |
|--|--|---|
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>(Continued)<br>Resins<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Waxes<br>Wood   | T1<br>D<br>T1<br>T1<br>T1   |
| GROUP 102:                               | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium nitrate<br>Nitrocellulose   | T2<br>T2  |
| GROUP 104:                               | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Sodium nitrate   | T1  |
| GROUP 105:                               | REDUCING AGENTS, STRONG<br>Hydroxyl amine  | T2  |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>Sulfuric acid (>70%)  | T2  |
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T2<br>T2  |
| OTHER INORGANICS                         | Ash<br>Ceramic (Molds and Crucibles)<br>Firebrick<br>Glass, labware<br>Grit<br>HEPA Filters<br>Insulation<br>Other filters<br>Salt (Calcium fluoride and calcium chloride)<br>Sand<br>Slag | T1<br>T1<br>T<br>T1<br>T2<br>T3<br>T1<br>T1<br>T1<br>T1<br>T1<br>T2 |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Envirostone<br>Surfactants<br>Vermiculite  | T1<br>T2<br>T2  |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU PYROCHEMICAL SALT

|           |   |   |
|-----------|---|---|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrofluoric acid  | T1  |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Beryllium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium hydroxide           | T1<br>D<br>T1<br>T1                                   |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Hydrofluoric acid<br>Potassium fluoride                   | D<br>T1<br>T2   |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium                                    | T   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Mercury (Vapor)<br>Nickel<br>Zirconium   | T2<br>T2<br>T2  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Copper<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum<br>Zirconium | T1<br>T2<br>T<br>M<br>M<br>T1<br>T<br>T2              |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Beryllium hydroxide<br>Cadmium<br>Calcium<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Zirconium              | T2<br>T2<br>T2<br>T2<br>T<br>T<br>M<br>T2<br>T2<br>T2 |

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## TRU PYROCHEMICAL SALT

|                  |  |    |
|------------------|--|----|
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS   |    |
|                  | Bakelite   | T2 |
|                  | Benelex  | T2 |
|                  | Plexiglas  | T2 |
|                  | Polyethylene (Packaging material)  | T2 |
|                  | Polypropylene  | T2 |
|                  | Polyvinyl chloride (Packaging material)  | T2 |
|                  | Rubber gloves (Leaded)   | T  |
| GROUP 104:       | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.) |    |
|                  | Sodium nitrate   | T2 |
| OTHER INORGANICS |  |    |
|                  | Ceramic (Molds and Crucibles)  | D  |
|                  | Salt (Calcium fluoride and calcium chloride)   | D  |
|                  | Salt (Sodium chloride and potassium chloride)  | D  |
|                  | Salt (Magnesium chloride)  | M  |

Refer to Introduction for a description of the designations used in this chemical list.

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MIXED COMBUSTIBLE/NONCOMBUSTIBLE WASTE

|           |  |                                 |
|-----------|--|---------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Boric acid<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid | T2<br>T2<br>T1<br>T1<br>T2      |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid  | T1<br>T2                        |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Polyethylene glycol  | T2                              |
| GROUP 5:  | ALDEHYDES<br>Formaldehyde  | T2                              |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Hydrofluoric acid  | D<br>T1                         |
| GROUP 21: | METAL, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Batteries (Carbon/Zinc and Alkaline)   | T2                              |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Copper<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum                                     | M<br>T<br>M<br>M<br>D<br>D<br>T |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Cadmium<br>Copper<br>Lead<br>Mercury  | T<br>M<br>D<br>T2               |

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MIXED COMBUSTIBLE/NONCOMBUSTIBLE WASTE

|                  |   |    |
|------------------|---|----|
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS  |    |
|                  | Bakelite  | M  |
|                  | Benelex (Polymethyl methacrylate)   | M  |
|                  | Carbon (Spent, Activated)   | T  |
|                  | Cellulose   | D  |
|                  | Grease  | T  |
|                  | Oil   | T  |
|                  | Paper   | D  |
|                  | Plexiglas (Polymethyl methacrylate)   | M  |
|                  | Polyethylene  | D  |
|                  | Polypropylene   | M  |
|                  | Polystyrene   | M  |
|                  | Polyurethane  | M  |
|                  | Polyvinyl chloride  | D  |
|                  | Resins  | T  |
|                  | Rubber gloves   | M  |
|                  | Rubber gloves (Leaded)  | M  |
|                  | Synthetic rubber  | M  |
|                  | Waxes   | T  |
|                  | Wood  | D  |
| GROUP 106:       | WATER AND MIXTURES CONTAINING WATER   |    |
|                  | Aqueous solutions and mixtures  | T2 |
|                  | Water   | T2 |
| GROUP 107:       | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.) |    |
|                  | Hydrobromic acid  | T2 |
| OTHER INORGANICS |   |    |
|                  | Ash (Burned gaskets, etc.)  | T2 |
|                  | Calcium chloride  | D  |
|                  | Calcium fluoride  | D  |
|                  | Firebrick   | T  |
|                  | Glass, labware (Glovebox windows)   | M  |
|                  | HEPA Filters  | T  |
|                  | Insulation  | T  |
|                  | Magnesium chloride  | D  |
|                  | Other filters (Glass fiber, furnace)  | T  |
|                  | Potassium chloride  | D  |
|                  | Slag (Dross from plasma arc cutting)  | T  |
|                  | Sodium chloride   | D  |

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MIXED COMBUSTIBLE/NONCOMBUSTIBLE WASTE

|  |   |
|--|---|
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Concrete                                 | M |
| Envirostone                              | M |
| Oil-Dri                                  | T |
| Portland Cement (Hydrated)               | T |
| Vermiculite                              | T |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLIDIFIED ORGANIC PROCESS SOLIDS

|           |  |                                 |
|-----------|--|---------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid           | T2<br>T2<br>T2                  |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid<br>Sulfuric acid (<70%)                  | T2<br>T2<br>T2                  |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Oxalic acid  | T2                              |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Methanol  | T1<br>T2                        |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>Potassium hydroxide<br>Sodium hydroxide                                 | T1<br>T2<br>T2                  |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Hydrofluoric acid  | T1<br>T2                        |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>Bromoform<br>Carbon tetrachloride<br>Dichloroethane<br>Trichloroethylene  | T<br>T2<br>T2<br>T2<br>T        |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium                                   | T                               |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Cadmium<br>Graphite (Molds and Crucibles)<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum | T2<br>T<br>T1<br>T1<br>T1<br>T2 |

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## SOLIDIFIED ORGANIC PROCESS SOLIDS

|            |   |   |
|------------|---|---|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Cadmium<br>Calcium<br>Lead<br>Mercury  | T2<br>T2<br>T2<br>T<br>T1<br>T2                 |
| GROUP 27:  | NITRO COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrocellulose<br>Urea nitrate   | T2<br>T2  |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED<br>Oils (C6 to C20)   | M   |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate<br>Trioctyl phosphine oxide  | M<br>T  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Oil<br>Polyethylene<br>Polypropylene (Ful-Flo Filters)<br>Polyvinyl chloride<br>Resins<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Wood | T1<br>M<br>T1<br>T<br>T1<br>M<br>T1<br>T2<br>T2 |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium nitrate<br>Calcium<br>Nitrocellulose<br>Urea nitrate   | T<br>T<br>T2<br>T2                              |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide<br>Other nitrate salts<br>Sodium nitrate<br>Urea nitrate  | T2<br>T<br>M<br>T2                              |
| GROUP 105: | REDUCING AGENTS, STRONG<br>Calcium<br>Hydroxyl amine  | T<br>T2   |



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## SOLIDIFIED ORGANIC PROCESS SOLIDS

|  |  |  |
|--|--|--|
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T1<br>T1   |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Calcium oxide<br>Sulfuric acid (>70%)  | T<br>T1<br>T2  |
| OTHER INORGANICS                         | Ash<br>Firebrick<br>Glass, labware<br>Grit<br>HEPA Filters<br>Insulation<br>Ceramic (Molds and Crucibles)<br>Other filters<br>Salt (Calcium fluoride and calcium chloride)<br>Sand<br>Slag<br>Soot | M<br>T1<br>T<br>T1<br>T<br>T2<br>T<br>T1<br>T1<br>T1<br>T2<br>T3 |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Envirostone<br>Oxalate salts<br>Surfactants<br>Vermiculite   | D<br>T<br>T1<br>T1   |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLIDIFIED AQUEOUS WASTE and TRITIUM CONTAMINATED INORGANIC WASTE

|           |  |                  |
|-----------|--|------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid | M<br>T<br>T      |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)                           | M<br>T           |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Citric acid<br>Lactic acid<br>Oxalic acid                 | T<br>T<br>T<br>T |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol   | T<br>T<br>T      |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium hydroxide | T<br>T<br>M<br>T |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Hydrofluoric acid                             | T<br>T           |
| GROUP 17: | HALOGENATED ORGANICS<br>Carbon tetrachloride<br>Chloroform<br>Trichloroethylene  | T<br>T<br>T      |
| GROUP 19: | KETONES<br>Acetone<br>Methyl ethyl ketone  | T<br>T           |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS, IN THE FORM OF<br>POWDERS, VAPORS OR SPONGES<br>Titanium sponges   | D                |

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SOLIDIFIED AQUEOUS WASTE and TRITIUM CONTAMINATED INORGANIC WASTE

|            |   |                       |
|------------|---|-----------------------|
| GROUP 23:  | METALS, OTHER ELEMENTAL, AND ALLOYS, ASSHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Chromium<br>Lead                                      | T<br>T                |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Chromium<br>Lead  | T<br>T<br>T           |
| GROUP 27   | NITRO COMPOUNDS<br>Picric acid (<0.01%)   | T                     |
| GROUP 31   | PHENOLS AND CREOSOLS<br>Picric acid (<0.01%)  | T                     |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Oil   | T                     |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Picric acid (<0.01%)                                | T                     |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide                     | T                     |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>Sulfuric acid       | T<br>T                |
|            | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Cement (Hydrated)<br>Emulsifiers<br>Envirostone<br>Sodium silicate<br>Zeolite (Alumina) | D<br>T<br>D<br>T<br>D |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLIDIFIED LIQUID AND FINE PARTICLE WASTE

|           |  |                  |
|-----------|--|------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid | M<br>T<br>T      |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)                           | M<br>T           |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Citric acid<br>Lactic acid<br>Oxalic acid                 | T<br>T<br>T<br>T |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol   | T<br>T<br>T      |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium hydroxide | T<br>T<br>M<br>T |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Hydrofluoric acid                             | T<br>T           |
| GROUP 17: | HALOGENATED ORGANICS<br>(Constituents reacted prior to loading in payload containers.)<br>Carbon tetrachloride<br>Chloroform<br>Trichloroethylene            | T<br>T<br>T      |
| GROUP 19: | KETONES<br>(Constituents reacted prior to loading in payload containers.)<br>Acetone<br>Methyl ethyl ketone  | T<br>T           |
| GROUP 23: | METALS, OTHER ELEMENTAL, AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Chromium<br>Lead   | T<br>T           |

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SOLIDIFIED LIQUID AND FINE PARTICLE WASTE

|            |   |                            |
|------------|---|----------------------------|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>(Constituents reacted prior to loading in payload containers.)<br>Beryllium<br>Chromium<br>Lead  | T<br>T<br>T                |
| GROUP 27   | NITRO COMPOUNDS<br>Picric acid (<0.01%)   | T                          |
| GROUP 31   | PHENOLS AND CREOSOLS<br>Picric acid (<0.01%)  | T                          |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>(Constituents reacted prior to loading in payload containers.)<br>Oil           | D                          |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Picric acid (<0.01%)                                  | T                          |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide                       | T                          |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>Sulfuric acid         | T<br>T                     |
|            | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Aquaset<br>Cement (Hydrated)<br>Emulsifiers<br>Envirostone<br>Petroset<br>Sodium silicate | D<br>D<br>T<br>D<br>D<br>T |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU COMBUSTIBLE WASTE

|           |  |                       |
|-----------|--|-----------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid                     | T<br>T<br>T           |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)   | T<br>T                |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Citric acid<br>Lactic acid<br>Oxalic acid                                     | T<br>T<br>T<br>T      |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol   | T<br>T<br>T           |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide | T<br>T<br>T<br>T<br>T |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Calcium fluoride<br>Hydrofluoric acid                             | T<br>T<br>T           |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Trichloroethylene   | T<br>T<br>T<br>T      |
| GROUP 19: | KETONES<br>Acetone<br>Methyl ethyl ketone  | T<br>T                |

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TRU COMBUSTIBLE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Magnesium  | T<br>T  |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Magnesium<br>Uranium<br>Zirconium   | T<br>T<br>T<br>T                                    |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Chromium<br>Copper<br>Graphite (Molds and Crucibles)<br>Iron<br>Lead<br>Nickel<br>Stainless Steel<br>Tantalum<br>Zirconium | T<br>T<br>T<br>M<br>T<br>T<br>T<br>T<br>M<br>T<br>T |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Calcium<br>Chromium<br>Copper<br>Lead<br>Nickel<br>Zirconium   | T<br>T<br>T<br>T<br>T<br>T<br>T                     |
| GROUP 27  | NITRO COMPOUNDS<br>Picric acid (<0.01%)  | T   |
| GROUP 31  | PHENOLS AND CREOSOLS<br>Picric acid (<0.01%)   | T   |



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TRU COMBUSTIBLE WASTE

|  |  |   |
|--|--|---|
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS             |   |
|  | Bakelite   | T |
|  | Cellulose  | T |
|  | Grease   | T |
|  | Oil  | T |
|  | Paper  | M |
|  | Polyethylene   | M |
|  | Polypropylene  | T |
|  | Polystyrene  | T |
|  | Polyvinyl chloride   | T |
|  | Resins   | T |
|  | Rubber gloves  | M |
|  | Rubber gloves (Leaded)   | T |
|  | Synthetic rubber   | T |
| GROUP 102:                               | EXPLOSIVES   |   |
|  | (Constituents reacted prior to loading in payload containers.) |   |
|  | Calcium  | T |
|  | Picric acid (<0.01%)   | T |
| GROUP 104:                               | OXIDIZING AGENTS, STRONG                                       |   |
|  | (Constituents reacted prior to loading in payload containers.) |   |
|  | Hydrogen peroxide  | T |
| GROUP 105:                               | REDUCING AGENTS, STRONG  |   |
|  | (Constituents reacted prior to loading in payload containers.) |   |
|  | Calcium  | T |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES                                      |   |
|  | (Constituents reacted prior to loading in payload containers.) |   |
|  | Calcium  | T |
|  | Calcium oxide  | T |
|  | Sulfuric acid  | T |
| OTHER INORGANICS                         |  |   |
|  | Firebrick  | T |
|  | Glass, labware   | M |
|  | Insulation (Furnace)   | T |
|  | Ceramic (Molds and Crucibles)                                  | T |
|  | Other filters  | T |
|  | Salt (Calcium fluoride and calcium chloride)                   | T |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |  |   |
|  | Cement   | T |
|  | Oil-Dri  | T |

Refer to Introduction for a description of the designations used in this chemical list.

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FILTER WASTE

|            |  |                                 |
|------------|--|---------------------------------|
| GROUP 2:   | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid   | T                               |
| GROUP 10:  | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Caustic residues   | T                               |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride   | T<br>T<br>T<br>T                |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Stainless Steel   | D<br>T                          |
| GROUP 28:  | HYDROCARBONS, ALIPHATIC, UNSATURATED (ALL ISOMERS)<br>Polypropylene (Ful-Flo Filters)  | D                               |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cloth/Rags<br>Paper<br>Polyethylene<br>Polypropylene (Ful-Flo Filters)<br>Polyvinyl chloride<br>Synthetic rubber<br>Wood | T<br>T<br>M<br>D<br>M<br>T<br>D |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrates   | T                               |
|            | OTHER INORGANICS<br>Asbestos<br>Fiberglass<br>HEPA Filters (Or filter media)<br>Insulation<br>Other filters<br>Plenum Prefilters (Fiberglass)                                  | M<br>M<br>D<br>D<br>D<br>D      |
|            | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Oil-Dri<br>Portland Cement (Hydrated)  | D<br>M                          |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU PYROCHEMICAL SALT WASTE

|                  |  |             |
|------------------|--|-------------|
| GROUP 10:        | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide  | M           |
| GROUP 15:        | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride   | D           |
| GROUP 21:        | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium                         | T           |
| GROUP 23:        | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Stainless Steel  | M           |
| GROUP 24:        | METALS AND METAL COMPOUNDS, TOXIC<br>Calcium   | T           |
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Other Plastic Material<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material) | T<br>M<br>M |
| GROUP 102:       | EXPLOSIVES<br>Calcium  | T           |
| GROUP 105:       | REDUCING AGENTS, STRONG<br>Calcium   | T           |
| GROUP 107:       | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Calcium oxide                                      | T<br>M      |
| OTHER INORGANICS | Salt   | D           |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU COMBINED METAL SCRAP AND INCIDENTAL COMBUSTIBLES

|           |  |                       |
|-----------|--|-----------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid                     | T<br>T<br>T           |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)   | T<br>T                |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Citric acid<br>Lactic acid<br>Oxalic acid                                     | T<br>T<br>T<br>T      |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol<br>Polyethylene glycol  | T<br>T<br>T<br>T      |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide | T<br>T<br>T<br>T<br>T |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Calcium fluoride<br>Hydrofluoric acid                             | T<br>T<br>T           |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Trichloroethylene   | T<br>T<br>T<br>T      |
| GROUP 19: | KETONES<br>Acetone<br>Methyl ethyl ketone  | T<br>T                |

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TRU COMBINED METAL SCRAP AND INCIDENTAL COMBUSTIBLES

|           |  |                                      |
|-----------|--|--------------------------------------|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Magnesium  | T<br>T                               |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Magnesium<br>Uranium<br>Zirconium   | T<br>T<br>T<br>T                     |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Copper<br>Graphite (Molds and Crucibles)<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum<br>Zirconium | M<br>T<br>M<br>T<br>M<br>D<br>M<br>T |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Calcium<br>Chromium<br>Copper<br>Lead<br>Nickel<br>Zirconium   | T<br>T<br>T<br>T<br>T<br>T<br>T      |
| GROUP 27  | NITRO COMPOUNDS<br>Picric acid (<0.01%)  | T                                    |
| GROUP 31  | PHENOLS AND CREOSOLS<br>Picric acid (<0.01%)   | T                                    |



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TRU COMBINED METAL SCRAP AND INCIDENTAL COMBUSTIBLES

|  |  |   |
|--|--|---|
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Bakelite<br>Cellulose<br>Grease<br>Oil<br>Paper<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyvinyl chloride<br>Resins<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber | T<br>T<br>T<br>T<br>M<br>D<br>T<br>T<br>M<br>T<br>M<br>T<br>T |
| GROUP 102:                               | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Picric acid (<0.01%)  | T<br>T  |
| GROUP 104:                               | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide  | T   |
| GROUP 105:                               | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium   | T   |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Calcium oxide<br>Sulfuric acid   | T<br>T<br>T   |
| OTHER INORGANICS                         | Firebrick<br>Glass, labware<br>Insulation (Furnace)<br>Ceramic (Molds and Crucibles)<br>Other Filters<br>Salt (Calcium fluoride and calcium chloride)  | T<br>M<br>T<br>T<br>T<br>T                                    |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Cement<br>Oil-Dri  | T<br>T  |

Refer to Introduction for a description of the designations used in this chemical list.

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Mound Laboratory  
List of Chemicals and Materials  
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SOLIDIFIED AQUEOUS WASTE AND CONTAMINATED SOIL

|           |  |                      |
|-----------|--|----------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid                                | T1<br>T2             |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hypochlorous acid<br>Nitric acid<br>Sulfuric acid (<70%)                  | T2<br>T1<br>T        |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Lactic acid<br>Oxalic acid   | T2<br>T2             |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Methanol<br>Propanol  | T1<br>T1<br>T1       |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Sodium carbonate<br>Sodium hydroxide<br>Sodium hypochlorite          | T1<br>T<br>T<br>T1   |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrofluoric acid  | T2                   |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Trichloroethylene  | T2<br>T1<br>T1       |
| GROUP 19: | KETONES<br>Acetone   | T1                   |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Magnesium<br>Potassium<br>Sodium | T2<br>T2<br>T2<br>T2 |

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(Continued)

SOLIDIFIED AQUEOUS WASTE AND CONTAMINATED SOIL

|           |  |  |
|-----------|--|--|
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Cobalt<br>Magnesium<br>Manganese<br>Mercury (Vapor)<br>Nickel<br>Thorium<br>Titanium<br>Uranium<br>Zirconium   | T2<br>T2<br>T2<br>T2<br>T2<br>T2<br>M<br>T2<br>T<br>T2                                       |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Carbon steel<br>Chromium<br>Cobalt<br>Copper<br>Iron<br>Lead<br>Manganese<br>Selenium<br>Silicon<br>Silver<br>Thorium<br>Tin<br>Titanium<br>Uranium<br>Zirconium | T2<br>T2<br>M<br>T2<br>T2<br>T2<br>T<br>T1<br>T<br>T2<br>T1<br>T2<br>M<br>T<br>T2<br>T<br>T2 |

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SOLIDIFIED AQUEOUS WASTE AND CONTAMINATED SOIL

|            |   |   |
|------------|---|---|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Cadmium<br>Calcium<br>Chromium<br>Cobalt<br>Copper<br>Lead<br>Manganese<br>Mercury<br>Nickel<br>Selenium<br>Strontium<br>Thorium<br>Titanium<br>Zirconium | T<br>T2<br>T2<br>T2<br>T2<br>T2<br>T1<br>T<br>T<br>T<br>T2<br>T2<br>M<br>T2<br>T2 |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Carbon (Spent, Activated)<br>Cellulose<br>Oil<br>Polybutadiene<br>Polystyrene<br>Wood   | T<br>T<br>T<br>T2<br>T1<br>T  |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium   | T   |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide<br>Sodium nitrate   | T2<br>T   |
| GROUP 105: | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Phosphorous<br>Sodium   | T2<br>T<br>T2   |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water  | T<br>T  |

Mound Laboratory  
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SOLIDIFIED AQUEOUS WASTE AND CONTAMINATED SOIL

|  |   |    |
|--|---|----|
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.) |    |
|  | Calcium   | T2 |
|  | Phosphorous   | T  |
|  | Potassium   | T2 |
|  | Sodium  | T2 |
|  | Sulfuric acid   | T  |
| OTHER INORGANICS                         |   |    |
|  | Ash   | M  |
|  | Calcium chloride  | M  |
|  | Ferric hydroxide  | M  |
|  | Sand  | M  |
|  | Soil  | D  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |    |
|  | Ash   | M  |
|  | Cement (Hydrated)   | D  |
|  | Florco  | M  |
|  | Sludge  | D  |
|  | Surfactants   | T  |
|  | Vermiculite   | T  |

Refer to Introduction for a description of the designations used in this chemical list.

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COMBUSTIBLE WASTE

|  |   |  |
|--|---|--|
| GROUP 22:                                | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Thorium   | T  |
| GROUP 23:                                | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Lead<br>Thorium  | T1<br>T  |
| GROUP 24:                                | METALS AND METAL COMPOUNDS, TOXIC<br>Lead<br>Mercury<br>Thorium   | T1<br>T2<br>T  |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Grease<br>Oil<br>Paper<br>Polybutadiene<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Wood | M<br>T<br>T<br>D<br>T<br>D<br>M<br>M<br>T<br>D<br>M<br>D<br>M<br>M |
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Water  | T1   |
| OTHER INORGANICS                         | HEPA Filters  | T  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Florco  | M  |

Refer to Introduction for a description of the designations used in this chemical list.

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NON-COMBUSTIBLE TRU WASTE

|            |   |  |
|------------|---|--|
| GROUP 21:  | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium   | T2   |
| GROUP 22:  | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Nickel<br>Thorium<br>Uranium<br>Zirconium  | T1<br>T1<br>T<br>T<br>T2                                     |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Chromium<br>Copper<br>Iron<br>Lead<br>Selenium<br>Silver<br>Stainless Steel<br>Thorium<br>Uranium<br>Zirconium | T<br>T2<br>T<br>T<br>D<br>T<br>T2<br>T2<br>D<br>T<br>T<br>T2 |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Barium<br>Cadmium<br>Chromium<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Selenium<br>Thorium<br>Zirconium   | T2<br>T2<br>T<br>T<br>T<br>T1<br>T1<br>T2<br>T<br>T2         |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Benelex<br>Plexiglas  | T<br>T   |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>Barium   | T2   |

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## NON-COMBUSTIBLE TRU WASTE

|  |    |
|--|----|
| OTHER INORGANICS                         |    |
| Ash                                      | T1 |
| Glass, labware                           | M  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |    |
| Concrete                                 | M  |

Refer to Introduction for a description of the designations used in this chemical list.

Nevada Test Site  
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SOLIDIFIED AQUEOUS WASTE

|           |  |                  |
|-----------|--|------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid | M<br>T<br>T      |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)                           | M<br>T           |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Citric acid<br>Lactic acid<br>Oxalic acid                 | T<br>T<br>T<br>T |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol   | T<br>T<br>T      |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium hydroxide | T<br>T<br>M<br>T |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Hydrofluoric acid                             | T<br>T           |
| GROUP 17: | HALOGENATED ORGANICS<br>Carbon tetrachloride<br>Chloroform<br>Trichloroethylene  | T<br>T<br>T      |
| GROUP 19: | KETONES<br>Acetone<br>Methyl ethyl ketone  | T<br>T           |
| GROUP 23: | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS,<br>MOULDINGS, DROPS, ETC.<br>Chromium<br>Lead   | T<br>T           |

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SOLIDIFIED AQUEOUS WASTE

|            |   |                  |
|------------|---|------------------|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Chromium<br>Lead  | T<br>T<br>T      |
| GROUP 27   | NITRO COMPOUNDS<br>Picric acid (<0.01%)   | T                |
| GROUP 31   | PHENOLS AND CREOSOLS<br>Picric acid (<0.01%)  | T                |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Oil   | T                |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Picric acid (<0.01%)                          | T                |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide               | T                |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>Sulfuric acid | T<br>T           |
|            | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Cement (Hydrated)<br>Emulsifiers<br>Envirostone<br>Sodium silicate                | D<br>T<br>D<br>T |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU COMBUSTIBLE WASTE

|           |  |                       |
|-----------|--|-----------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid                     | T<br>T<br>T           |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)   | T<br>T                |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Citric acid<br>Lactic acid<br>Oxalic acid                                     | T<br>T<br>T<br>T      |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol   | T<br>T<br>T           |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide | T<br>T<br>T<br>T<br>T |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Calcium fluoride<br>Hydrofluoric acid                             | T<br>T<br>T           |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Trichloroethylene   | T<br>T<br>T<br>T      |
| GROUP 19: | KETONES<br>Acetone<br>Methyl ethyl ketone  | T<br>T                |

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TRU COMBUSTIBLE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Magnesium  | T<br>T                                    |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Magnesium<br>Uranium<br>Zirconium   | T<br>T<br>T<br>T                          |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Chromium<br>Copper<br>Graphite (Molds & Crucibles)<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum<br>Zirconium | T<br>T<br>T<br>M<br>M<br>T<br>M<br>T<br>T |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Calcium<br>Chromium<br>Copper<br>Lead<br>Nickel<br>Zirconium   | T<br>T<br>T<br>T<br>T<br>T<br>T           |
| GROUP 27  | NITRO COMPOUNDS<br>Picric acid (<0.01%)  | T   |
| GROUP 31  | PHENOLS AND CREOSOLS<br>Picric acid (<0.01%)   | T   |

Nevada Test Site  
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TRU COMBUSTIBLE WASTE

|  |  |  |
|--|--|--|
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Bakelite<br>Cellulose<br>Grease<br>Oil<br>Paper<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyvinyl chloride<br>Resins<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber | T<br>D<br>T<br>T<br>D<br>D<br>T<br>T<br>T<br>T<br>T<br>M<br>T<br>M |
| GROUP 102:                               | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Picric acid (<0.01%)  | T<br>T   |
| GROUP 104:                               | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide  | T  |
| GROUP 105:                               | REDUCING AGENTS, STRONG<br>Calcium   | T  |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Calcium oxide<br>Sulfuric acid   | T<br>T<br>T  |
| OTHER INORGANICS                         | Firebrick<br>Glass, labware<br>Insulation (Furnace)<br>Ceramic (Molds and Crucibles)<br>Other filters<br>Salt (Calcium fluoride and calcium chloride)  | T<br>M<br>T<br>T<br>T<br>T   |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Cement<br>Oil-Dri  | T<br>T   |

Refer to Introduction for a description of the designations used in this chemical list.

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Nevada Test Site  
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TRU FILTER WASTE

|           |  |                       |
|-----------|--|-----------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid                     | T<br>T<br>T           |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid<br>Sulfuric acid (<70%)                            | T<br>T<br>T           |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Citric acid<br>Lactic acid<br>Oxalic acid                                     | T<br>T<br>T<br>T      |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol   | T<br>T<br>T           |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide | T<br>T<br>T<br>T<br>T |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Calcium fluoride<br>Hydrofluoric acid                             | T<br>T<br>T           |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Trichloroethylene   | T<br>T<br>T<br>T      |
| GROUP 19: | KETONES<br>Acetone<br>Methyl ethyl ketone  | T<br>T                |

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List of Chemicals and Materials  
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TRU FILTER WASTE

|           |  |                                      |
|-----------|--|--------------------------------------|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Magnesium      | T<br>T                               |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Magnesium<br>Nickel<br>Zirconium                          | T<br>T<br>T<br>T                     |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Chromium<br>Copper<br>Graphite<br>Lead<br>Steel<br>Zirconium | T<br>T<br>T<br>T<br>T<br>D<br>T      |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Calcium<br>Chromium<br>Copper<br>Lead<br>Nickel<br>Uranium<br>Zirconium                              | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T |
| GROUP 27  | NITRO COMPOUNDS<br>Picric acid (<0.01%)  | T                                    |
| GROUP 28  | HYDROCARBON, ALIPHATIC, UNSATURATED<br>Polypropylene   | D                                    |
| GROUP 31  | PHENOLS AND CREOSOLS<br>Picric acid (<0.01%)   | T                                    |

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TRU FILTER WASTE

|                  |  |   |
|------------------|--|---|
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS             |   |
|                  | Bakelite   | T |
|                  | Cellulose  | T |
|                  | Ful-Flo Filters  | D |
|                  | Grease   | T |
|                  | Neoprene   | M |
|                  | Oil  | T |
|                  | Paper  | M |
|                  | Plastic  | M |
|                  | Plastic Bags   | M |
|                  | Polyethylene   | M |
|                  | Polypropylene  | D |
|                  | Polystyrene  | T |
|                  | Polyvinyl chloride   | T |
|                  | Resins   | T |
|                  | Synthetic rubber   | M |
|                  | Tape   | M |
|                  | Urethane   | M |
|                  | Wood   | D |
| GROUP 102:       | EXPLOSIVES   |   |
|                  | (Constituents reacted prior to loading in payload containers.) |   |
|                  | Calcium  | T |
|                  | Picric acid (<0.01%)   | T |
| GROUP 104:       | OXIDIZING AGENTS, STRONG                                       |   |
|                  | (Constituents reacted prior to loading in payload containers.) |   |
|                  | Hydrogen peroxide  | T |
|                  | Oxalic acid  | T |
| GROUP 105:       | REDUCING AGENTS, STRONG  |   |
|                  | Calcium  | T |
| GROUP 107:       | WATER REACTIVE SUBSTANCES                                      |   |
|                  | (Constituents reacted prior to loading in payload containers.) |   |
|                  | Calcium  | T |
|                  | Calcium oxide  | T |
|                  | Oxalic acid  | T |
|                  | Sulfuric acid (<70%)   | T |
| OTHER INORGANICS |  |   |
|                  | Cement   | T |
|                  | Fiberglass   | D |
|                  | Filter Frames  | D |
|                  | Filter Material (Boron silica)                                 | D |
|                  | HEPA Filter (Media)  | D |
|                  | WEF Filters, Flanges   | D |

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TRU FILTER WASTE

|   |   |
|---|---|
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Oil-Dri | T |
|---|---|

Refer to Introduction for a description of the designations used in this chemical list.

Nevada Test Site  
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TRU COMBUSTIBLE WASTE

|           |  |                       |
|-----------|--|-----------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid                     | T<br>T<br>T           |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)   | T<br>T                |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Citric acid<br>Lactic acid<br>Oxalic acid                                     | T<br>T<br>T<br>T      |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Isopropanol<br>Methanol   | T<br>T<br>T           |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide | T<br>T<br>T<br>T<br>T |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Calcium fluoride<br>Hydrofluoric acid                             | T<br>T<br>T           |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Trichloroethylene   | T<br>T<br>T<br>T      |
| GROUP 19: | KETONES<br>Acetone<br>Methyl ethyl ketone  | T<br>T                |

Nevada Test Site  
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TRU COMBUSTIBLE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Magnesium  | T<br>T                                    |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Magnesium<br>Uranium<br>Zirconium   | T<br>T<br>T<br>T                          |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Chromium<br>Copper<br>Graphite (Molds and Crucibles)<br>Iron<br>Lead<br>Stainless Steel<br>Tantalum<br>Zirconium | T<br>T<br>T<br>M<br>M<br>T<br>M<br>T<br>T |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Calcium<br>Chromium<br>Copper<br>Lead<br>Nickel<br>Uranium<br>Zirconium  | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T      |
| GROUP 27  | NITRO COMPOUNDS<br>Picric acid (<0.01%)  | T   |
| GROUP 28  | HYDROCARBON, ALIPHATIC, UNSATURATED<br>Polypropylene   | T   |
| GROUP 31  | PHENOLS AND CREOSOLS<br>Picric acid (<0.01%)   | T   |

Nevada Test Site  
List of Chemicals and Materials  
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Content Code NT 125/225  
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TRU COMBUSTIBLE WASTE

|  |  |  |
|--|--|--|
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Bakelite<br>Cellulose<br>Grease<br>Oil<br>Paper<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyvinyl chloride<br>Resins<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber | T<br>D<br>T<br>T<br>D<br>D<br>T<br>T<br>T<br>T<br>T<br>M<br>T<br>M |
| GROUP 102:                               | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Picric acid (<0.01%)  | T<br>T   |
| GROUP 104:                               | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide<br>Oxalic acid   | T<br>T   |
| GROUP 105:                               | REDUCING AGENTS, STRONG<br>Calcium   | T  |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Calcium oxide<br>Oxalic acid<br>Sulfuric acid (<70%)   | T<br>T<br>T<br>T   |
| OTHER INORGANICS                         | Firebrick<br>Glass, labware<br>Insulation (Furnace)<br>Ceramic (Molds and Crucibles)<br>Other filters<br>Salt (Calcium fluoride and calcium chloride)  | T<br>M<br>T<br>T<br>T<br>T   |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Cement<br>Oil-Dri  | T<br>T   |

Refer to Introduction for a description of the designations used in this chemical list.

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Oak Ridge National Laboratory  
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Content Code OR 125/225

TRU MIXED PAPER, METAL, AND GLASS

|           |   |  |
|-----------|---|--|
| GROUP 3:  | ACIDS, ORGANIC<br>EDTA  | T1   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>2-Ethyl-1-hexanol<br>Ethanol<br>Isopropanol<br>Methanol   | T2<br>T2<br>T2<br>T2                                       |
| GROUP 6:  | AMIDES<br>Acetamide   | T2   |
| GROUP 7:  | AMINES, ALIPHATIC AND AROMATIC<br>Adogen-364-HP (Trilaurylamine)  | T2   |
| GROUP 8:  | AZO COMPOUNDS, DIAZO COMPOUNDS, AND HYDRAZINES<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrazine   | T  |
| GROUP 13: | ESTERS<br>Amyl acetate  | T2   |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Diethyl benzene (DEB)<br>Diisopropylbenzene<br>Toluene  | T2<br>T2<br>T2   |
| GROUP 17: | HALOGENATED ORGANICS<br>Carbon tetrachloride  | T2   |
| GROUP 19: | KETONES<br>2-5-Di-tert-butyl-hydroquinone (DBHQ)<br>Acetone<br>Thenoylfluoroacetone (TFA)   | T2<br>T2<br>T2   |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Copper<br>Gold<br>Hastelloy-C<br>Iron<br>Platinum<br>Stainless Steel<br>Tantalum<br>Tungsten<br>Uranium<br>Zinc<br>Zircalloy | T<br>T<br>T<br>T<br>D<br>T1<br>D<br>T1<br>T<br>T<br>T<br>T |

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List of Chemicals and Materials  
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TRU MIXED PAPER, METAL, AND GLASS

|                  |   |  |
|------------------|---|--|
| GROUP 24:        | METALS AND METAL COMPOUNDS, TOXIC<br>Copper<br>Nickel<br>Uranium<br>Zinc  | T<br>T<br>T<br>T   |
| GROUP 29:        | HYDROCARBON, ALIPHATIC, SATURATED<br>N-Dodecane<br>N-Paraffin hydrocarbons (NPH)  | T1<br>T  |
| GROUP 32:        | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate  | T1   |
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Cork<br>Cotton<br>Deodorized mineral spirits<br>Ful-Flo Filters (Polypropylene)<br>Paper<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride<br>Resins<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Teflon<br>Vacuum grease<br>Wood | T<br>T<br>T<br>T<br>T<br>D<br>D<br>T<br>T<br>T<br>T<br>T<br>T<br>M<br>T<br>T<br>T<br>T |
| GROUP 104:       | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide   | T1   |
| GROUP 106:       | WATER AND MIXTURES CONTAINING WATER<br>Water  | T  |
| OTHER INORGANICS | Glass, labware<br>HEPA Filters (Old)  | D<br>D   |

Refer to Introduction for a description of the designations used in this chemical list.

Rocky Flats Environmental Technology Site  
List of Chemicals and Materials  
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SOLIDIFIED AQUEOUS WASTE

|           |  |  |
|-----------|--|--|
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Tetraphosphoric acid  | T1                                     |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Oxalic acid<br>Ethylenediaminetetraacetic acid (EDTA)  | T1<br>T2                               |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isopropanol<br>Methanol  | T2<br>T2<br>T2<br>T2                   |
| GROUP 11: | CYANIDES<br>Cyanide  | T1                                     |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Benzene<br>Ethyl benzene<br>Toluene<br>Xylene  | T1<br>T2<br>T2<br>T2                   |
| GROUP 17: | HALOGENATED ORGANICS<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride<br>Tetrachloroethylene<br>Trichloroethylene | T2<br>T2<br>T1<br>T2<br>T1<br>T1<br>T1 |
| GROUP 19: | KETONES<br>Acetone   | T1                                     |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Magnesium   | T1<br>T1                               |
| GROUP 22: | METALS OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Magnesium<br>Selenium   | T1<br>T1                               |

Rocky Flats Environmental Technology Site  
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SOLIDIFIED AQUEOUS WASTE

|                |   |                                       |
|----------------|---|---------------------------------------|
| GROUP 23:      | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Cadmium<br>Iron<br>Lead<br>Selenium<br>Zinc-Magnesium Alloy   | T2<br>T1<br>T<br>T1<br>T              |
| GROUP 24:      | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Barium<br>Beryllium<br>Cadmium<br>Lead<br>Mercury<br>Selenium   | T1<br>T1<br>T2<br>T2<br>T<br>T1<br>T1 |
| GROUP 28:      | HYDROCARBON, ALPHATIC, SATURATED<br>Polypropylene   | T                                     |
| GROUP 32:      | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND PHOSPHODITHIOATES<br>Tributyl phosphate   | T3                                    |
| GROUP 101:     | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Celotex (Packaging material)<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polyvinyl chloride (Packaging material)<br>Resin | T<br>D<br>M<br>T<br>M<br>T            |
| GROUP 106:     | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures (Fixed in matrix)<br>Sludge (Fixed in matrix)<br>Water  | T<br>D<br>D                           |
| GROUP 107:     | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Barium   | T1                                    |
| OTHER ORGANICS | Flocculating agent (Polyelectrolyte)<br>Nochar Acid Bond<br>Waste Lock 770™<br>WaterWorks Crystals®   | T<br>T<br>T<br>T                      |

Rocky Flats Environmental Technology Site  
List of Chemicals and Materials  
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SOLIDIFIED AQUEOUS WASTE

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Firebrick                                | T |
| Fuller's Earth                           | M |
| Glass                                    | T |
| Insulation                               | T |
| Molds and Crucibles                      | T |
| Soot                                     | T |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Abzorbit                                 | M |
| Diatomite                                | D |
| Oil-Dry                                  | D |
| Portland Cement (Hydrated)               | D |
| Ramcote Cement (Hydrated)                | D |

Refer to Introduction for a description of the designations used in this chemical list.

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Rocky Flats Environmental Technology Site  
List of Chemicals and Materials  
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SOLIDIFIED ORGANICS

|           |  |                                      |
|-----------|--|--------------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers)<br>Hydrofluoric acid  | T                                    |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butanol<br>CC T207®<br>ET Glycerine Solution®<br>Ethanol<br>Isopropanol<br>Methanol  | T2<br>D<br>M<br>T2<br>T2<br>T2       |
| GROUP 10: | CAUSTICS<br>Magnesium hydroxide (packaging material)<br>Sodium carbonate (packaging material)  | M<br>M                               |
| GROUP 13: | ESTERS<br>Polyethylene glycol ester  | M                                    |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Hydrofluoric acid                                       | T<br>T                               |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Ethyl benzene<br>Toluene<br>Xylene   | T2<br>T2<br>T2                       |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform   | D<br>M<br>M<br>D                     |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS OR SPONGES<br>Nickel<br>Selenium  | T2<br>T1                             |
| GROUP 23: | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Cadmium<br>Chromium<br>Iron<br>Lead<br>Metal cans<br>Selenium<br>Zinc-Magnesium Alloy | T2<br>T2<br>T2<br>T2<br>D<br>T1<br>T |

Rocky Flats Environmental Technology Site  
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SOLIDIFIED ORGANICS

|  |   |  |
|--|---|--|
| GROUP 24:                                | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Cadmium<br>Chromium<br>Lead<br>Mercury<br>Nickel<br>Selenium<br>Silver   | T1<br>T2<br>T2<br>T2<br>T2<br>T1<br>T2<br>T1<br>T1 |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>CC T207®<br>Celotex (Packaging material)<br>Ion exchange resin<br>Oil<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)<br>Grease | D<br>D<br>D<br>D<br>T<br>T<br>D                    |
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>CC T207®<br>ET Glycerine Solution®<br>Water  | D<br>M<br>T  |
| OTHER INORGANICS                         | Aluminum nitrate<br>Ferrous sulfamate<br>Fuller's Earth   | T<br>T<br>M  |
| OTHER ORGANICS                           | Flocculating agents<br>Nochar Acid Bond<br>Nochar Petro Bond  | T<br>M<br>D  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Abzorbit<br>Absorbent polymers<br>Envirostone (CaSO <sub>4</sub> )<br>Flocculating agents<br>Magnesia Cement<br>Oil-Dry<br>Portland Cement<br>Potassium sulfate   | M<br>M<br>D<br>T<br>D<br>D<br>D<br>M               |

Refer to Introduction for a description of the designations used in this chemical list.



Rocky Flats Environmental Technology Site  
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SOLIDIFIED LABORATORY WASTE

|            |   |                            |
|------------|---|----------------------------|
| GROUP 3:   | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Ascorbic acid<br>Citric acid<br>EDTA<br>Oxalic acid  | T<br>T<br>T<br>T<br>T      |
| GROUP 4:   | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isopropanol<br>Methanol   | T1<br>T1<br>T1<br>T1       |
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Toluene<br>Xylene   | T2<br>T1                   |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,2-Dichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Methylene chloride   | T2<br>T1<br>T2             |
| GROUP 19:  | KETONES<br>Thenoyl trifluoroacetone (TTA)   | T                          |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOY, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Cadmium<br>Zinc-Magnesium Alloy   | T2<br>T                    |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Cadmium  | T2<br>T2<br>T2             |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate<br>Trioctyl phosphine oxide  | T<br>T                     |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Celotex (Packaging material)<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polyvinyl chloride (Packaging material)<br>Resin | T<br>D<br>T<br>T<br>T<br>T |

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SOLIDIFIED LABORATORY WASTE

|  |  |    |
|--|--|----|
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER              |    |
|  | Aqueous solutions and mixtures (Fixed in Matrix) | M  |
|  | Water  | T  |
| OTHER ORGANICS                           |  |    |
|  | 1,10-Phenanthroline                              | T3 |
|  | Alpha-hydroxyquinoline                           | T  |
|  | Nochar Petro Bond                                | D  |
|  | Sodium acetate                                   | T  |
|  | Sodium citrate                                   | T  |
| OTHER INORGANICS                         |  |    |
|  | Firebrick  | T  |
|  | Glass  | T  |
|  | Insulation                                       | T  |
|  | Molds and Crucibles                              | T  |
|  | Soot   | T  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |  |    |
|  | Magnesia Cement (Hydrated)                       | D  |
|  | Portland Cement (Hydrated)                       | D  |

Refer to Introduction for a description of the designations used in this chemical list.

Rocky Flats Environmental Technology Site  
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Content Code RF 114/214

CEMENTED INORGANIC PROCESS SOLIDS

|            |   |  |
|------------|---|--|
| GROUP 4:   | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isopropanol<br>Methanol   | T2<br>T2<br>T2<br>T2                         |
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Ethyl benzene<br>Toluene<br>Xylene  | T2<br>T2<br>T2                               |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride              | T2<br>T1<br>T1<br>T1<br>T1                   |
| GROUP 22:  | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Selenium  | T1   |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOY, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Cadmium<br>Chromium<br>Lead<br>Metal cans<br>Selenium<br>Sliver<br>Zinc-Magnesium Alloy | T2<br>T1<br>T1<br>D<br>T1<br>T1<br>T         |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Cadmium<br>Chromium<br>Lead<br>Mercury<br>Selenium<br>Silver   | T1<br>T2<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1 |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES, PHOSPHODITHIOATES<br>Tributyl phosphate  | T  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Celotex (Packaging material)<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)      | D<br>T<br>T                                  |

Rocky Flats Environmental Technology Site  
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## CEMENTED INORGANIC PROCESS SOLIDS

|  |   |
|--|---|
| GROUP 106: WATER AND MIXTURES CONTAINING WATER |   |
| Water  | T |
| OTHER INORGANICS                               |   |
| Ash  | D |
| Ash heel                                       | D |
| Firebrick                                      | D |
| Grit   | D |
| Sand   | D |
| Sand (Slag and Crucible)                       | D |
| Sand (Slag and Crucible heel)                  | D |
| Slag   | D |
| Soot   | D |
| Soot heel                                      | D |
| OTHER ORGANICS                                 |   |
| Nochar Acid Bond                               | T |
| Waste Lock 770™                                | T |
| WaterWorks Crystals®                           | T |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS       |   |
| Absorbent polymers                             | T |
| Flocculating agents (Polyelectrolyte)          | T |
| Portland Cement (Hydrated)                     | D |

Refer to Introduction for a description of the designations used in this chemical list.

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Content Code RF 115/215

GRAPHITE WASTE

|           |  |  |
|-----------|--|--|
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Benzoic acid   | T2   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Benzyl alcohol<br>Methanol   | T3<br>T1                                     |
| GROUP 7:  | AMINES, ALIPHATIC AND AROMATIC<br>N-Nitrosodimethylamine<br>Pyridine   | T2<br>T3                                     |
| GROUP 13: | ESTERS<br>Bis(2-Ethylhexyl) phthalate<br>Butyl benzyl phthalate<br>Diethyl phthalate<br>Dimethyl phthalate<br>Di-n-butyl phthalate<br>Di-n-octyl phthalate | T2<br>T2<br>T2<br>T2<br>T2<br>T2             |
| GROUP 14: | ETHERS<br>Dibenzofuran   | T3   |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride   | D  |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>2-Methylnaphthalene<br>Benzene<br>Ethylbenzene<br>Naphthalene<br>Phenanthrene<br>Toluene<br>m,p-Xylene<br>o-Xylene               | T3<br>T1<br>T3<br>T2<br>T3<br>T1<br>T2<br>T2 |

Rocky Flats Environmental Technology Site  
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GRAPHITE WASTE

|           |  |    |
|-----------|--|----|
| GROUP 17: | HALOGENATED ORGANICS   |    |
|           | 1,1-Dichloroethene   | T1 |
|           | 1,2-Dichloroethane   | T3 |
|           | 1,1,1-Trichloroethane  | T1 |
|           | 1,1,2-Trichloro-1,2,2-trifluoroethane  | T1 |
|           | Bromodichloromethane   | T3 |
|           | Carbon tetrachloride   | T1 |
|           | Chlorobenzene  | T3 |
|           | Chloroethane   | T3 |
|           | Chloroform   | T1 |
|           | Chloromethane  | T3 |
|           | Hexachlorobenzene  | T3 |
|           | Hexachloroethane   | T2 |
|           | Methylene chloride   | T1 |
|           | Pentachlorobenzene   | T3 |
|           | Tetrachloroethene  | T2 |
|           | Trichloroethene  | T1 |
| GROUP 19: | KETONES  |    |
|           | 2-Butanone   | T1 |
|           | 2-Hexanone   | T2 |
|           | 4-Methyl-2-pentanone   | T2 |
|           | Acetone  | T1 |
|           | Acetophenone   | T2 |
| GROUP 20: | MERCAPTANS AND OTHER ORGANIC SULFIDES  |    |
|           | Carbon disulfide   | T3 |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS                      |    |
|           | Barium   | T1 |
|           | Magnesium  | D  |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES |    |
|           | Aluminum   | M  |
|           | Cobalt   | T2 |
|           | Magnesium  | D  |
|           | Manganese  | T1 |
|           | Molybdenum   | T1 |
|           | Nickel   | T  |
|           | Selenium   | T1 |
|           | Titanium   | T1 |
|           | Zinc   | T1 |

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GRAPHITE WASTE

|           |   |    |
|-----------|---|----|
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOY, AS SHEETS, RODS, MOLDINGS, DROPS, ETC. |    |
|           | Aluminum  | M  |
|           | Antimony  | T2 |
|           | Cadmium   | T2 |
|           | Chromium  | T  |
|           | Cobalt  | T2 |
|           | Copper  | M  |
|           | Graphite (Molds and Crucibles)  | D  |
|           | Iron  | M  |
|           | Lead  | T1 |
|           | Manganese   | T1 |
|           | Molybdenum  | T2 |
|           | Selenium  | T1 |
|           | Titanium  | T1 |
|           | Zinc  | T1 |
|           | Zinc-Magnesium Alloy  | D  |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC   |    |
|           | Antimony  | T2 |
|           | Arsenic   | T2 |
|           | Barium  | T1 |
|           | Beryllium   | T2 |
|           | Cadmium   | T2 |
|           | Chromium  | T  |
|           | Cobalt  | T2 |
|           | Copper  | M  |
|           | Lead  | T1 |
|           | Manganese   | T1 |
|           | Mercury   | T2 |
|           | Molybdenum  | T2 |
|           | Nickel  | T  |
|           | Selenium  | T1 |
|           | Silver  | T2 |
|           | Strontium   | T  |
|           | Thallium  | T2 |
|           | Titanium  | T1 |
|           | Vanadium  | T2 |
|           | Zinc  | T1 |

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GRAPHITE WASTE

|                |  |    |
|----------------|--|----|
| GROUP 27:      | NITRO COMPOUNDS  |    |
|                | 2-Nitrophenol  | T2 |
|                | 4-Nitrophenol  | T2 |
|                | 2,4-Dinitrophenol  | T2 |
|                | 2,6-Dinitrotoluene   | T3 |
|                | 4,6-Dinitro-2-methylphenol                                     | T2 |
|                | N-Nitrosodimethylamine   | T2 |
|                | Nitrobenzene   | T3 |
| GROUP 31:      | PHENOLS AND CRESOLS  |    |
|                | 2-Methylphenol   | T3 |
|                | 2-Nitrophenol  | T2 |
|                | 3-Methylphenol   | T3 |
|                | 4-Methylphenol   | T3 |
|                | 4-Nitrophenol  | T2 |
|                | 2,4-Dimethyl phenol  | T3 |
|                | 2,4-Dinitrophenol  | T2 |
|                | 4,6-Dinitro-2-methylphenol                                     | T2 |
|                | Phenol   | T2 |
| GROUP 101:     | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS             |    |
|                | Celotex (Packaging material)                                   | D  |
|                | Polyethylene (Packaging material)                              | T  |
|                | Polyvinyl chloride (Packaging material)                        | T  |
| GROUP 105:     | REDUCING AGENTS, STRONG  |    |
|                | Phosphorus   | T  |
| GROUP 107:     | WATER REACTIVE SUBSTANCES                                      |    |
|                | (Constituents reacted prior to loading in payload containers.) |    |
|                | Barium   | T1 |
|                | Phosphorus   | T  |
| OTHER ORGANICS |  |    |
|                | 2-Picoline   | T3 |
|                | Nochar Acid Bond   | T  |
|                | Nochar Petro Bond  | T  |
|                | Waste Lock 770™  | T  |
|                | WaterWorks Crystals®   | T  |

Refer to Introduction for a description of the designations used in this chemical list.



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COMBUSTIBLE WASTE

|           |  |                                  |
|-----------|--|----------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid   | T                                |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>0300 Liquid<br>Nitric acid<br>Sulfamic acid                         | T<br>T<br>T2                     |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>0200 Liquid<br>Cyclohexanediaminetetraacetic acid (CDTA)                       | T<br>T2                          |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>0100 Liquid<br>1-Butanol<br>Ethyl alcohol<br>Isopropyl alcohol<br>Methanol   | T<br>T1<br>T1<br>T2<br>T1        |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Potassium hydroxide<br>Sodium hydroxide  | T<br>T                           |
| GROUP 14: | ETHERS<br>0100 Liquid  | T                                |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>0200 Liquid<br>Calcium fluoride<br>Potassium fluoride<br>Sodium fluoride | T<br>T<br>T<br>T                 |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>1,2,4-Trimethylbenzene<br>1,3,5-Trimethylbenzene<br>Benzene<br>Ethylbenzene<br>Toluene<br>Xylene   | T1<br>T1<br>T1<br>T1<br>T1<br>T1 |

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COMBUSTIBLE WASTE

|           |   |   |
|-----------|---|---|
| GROUP 17: | HALOGENATED ORGANICS<br>0100 Liquid<br>1,1-Dichloroethane<br>1,1-Dichloroethene<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Cis-1,2-dichloroethene<br>Methylene chloride<br>Trichloroethylene<br>Tetrachloroethylene | T<br>T1<br>T1<br>T<br>T<br>T1<br>T1<br>T2<br>T1<br>T1<br>T1 |
| GROUP 19: | KETONES<br>2-Butanone<br>Acetone  | T1<br>T1  |
| GROUP 20: | MERCAPTANS AND OTHER ORGANIC SULFIDES<br>Carbon disulfide   | T1  |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium   | T2  |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Selenium  | T2  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Chromium<br>Copper<br>Graphite<br>Iron<br>Lead<br>Low carbon steel<br>Selenium<br>Stainless steel<br>Zinc-Magnesium Alloy  | M<br>T2<br>M<br>M<br>T<br>M<br>M<br>M<br>T2<br>M<br>T       |

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COMBUSTIBLE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Barium<br>Beryllium<br>Cadmium<br>Chromium<br>Copper<br>Lead<br>Lead acetate<br>Mercury<br>Potassium dichromate<br>Potassium permanganate<br>Selenium<br>Silver | T2<br>T1<br>T2<br>T2<br>M<br>M<br>T1<br>T2<br>T<br>T2<br>T2<br>T2 |
| GROUP 28: | HYDROCARBON, ALIPHATIC UNSATURATED<br>Polypropylene  | M   |
| GROUP 29: | HYDROCARBON, ALIPHATIC, SATURATED<br>Cyclohexane<br>Hexane<br>Isooctane  | T1<br>T1<br>T2  |
| GROUP 32: | ORGANOPHOSPHATES, PHOSPHOTIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate  | T   |

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COMBUSTIBLE WASTE

|            |   |    |
|------------|---|----|
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS  |    |
|            | Cardboard   | D  |
|            | Celotex (Packaging material)  | D  |
|            | Fiberglass  | M  |
|            | Filter media  | M  |
|            | Granular activated carbon   | M  |
|            | Grease  | D  |
|            | Insulation  | M  |
|            | Leather   | M  |
|            | Oil   | D  |
|            | Paint   | M  |
|            | Paper   | D  |
|            | Polyamides  | M  |
|            | Polyethylene  | D  |
|            | Polypropylene   | M  |
|            | Polystyrene   | M  |
|            | Polyurethane  | M  |
|            | Polyvinyl chloride  | D  |
|            | Rags and Cloth  | D  |
|            | Synthetic rubber  | D  |
|            | Teflon  | M  |
|            | Tygon tubing  | D  |
|            | Wood  | D  |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)  |    |
|            | Aluminum nitrate  | T1 |
|            | Calcium nitrate   | T1 |
|            | Hydrogen peroxide   | T2 |
|            | Potassium dichromate  | T  |
|            | Potassium permanganate  | T2 |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER   |    |
|            | Water   | D  |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.) |    |
|            | Barium  | T2 |

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## COMBUSTIBLE WASTE

|   |    |
|---|----|
| OTHER ORGANICS                                  |    |
| Carboline Neoprene F1 Adhesive Tubegrade        | T  |
| Cellusolve                                      | T1 |
| Developer                                       | T1 |
| Dioctyl sebecate                                | T1 |
| Dykem Blue                                      | T2 |
| Impression casting compound                     | T  |
| K W Cleaner                                     | T  |
| Karl Fischer Reagent                            | T1 |
| Mariko  | T1 |
| Molykote  | T1 |
| Nochar Acid Bond (A660)                         | M  |
| Nochar Petro Bond (A610)                        | M  |
| Nye's Watch Oil                                 | T  |
| Scintillation Cocktail                          | T2 |
| Triple Ionic Strength Adjustment Buffer (TISAB) | T2 |
| Waste Lock 770™                                 | M  |
| WaterWorks Crystals®                            | M  |
| OTHER INORGANICS                                |    |
| Asbestos  | M  |
| Ceramics  | M  |
| Cerium nitrate                                  | T  |
| Chloride salts                                  | T1 |
| Fiberglass                                      | M  |
| Filter media                                    | M  |
| Fuller's Earth                                  | M  |
| Insulation                                      | M  |
| Kathene   | T1 |
| Potassium iodide                                | T1 |
| Silicone  | M  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS        |    |
| Absorbent polymers                              | D  |
| Abzorbit  | M  |
| AquaSorbe-HP                                    | M  |
| Cement  | D  |
| Oil-Dri   | D  |

Refer to Introduction for a description of the designations used in this chemical list.

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METAL WASTE

|           |  |                                  |
|-----------|--|----------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid                               | T                                |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>0300 Liquid<br>Nitric acid<br>Sulfuric acid (<70%)  | T<br>T<br>T                      |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>0200 Liquid<br>Ammonium (Diethylene triamine) pentaacetic acid | T<br>T                           |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>0100 Liquid<br>Butanol<br>Ethyl alcohol<br>Isobutyl alcohol<br>Methanol  | T<br>T1<br>T<br>T1<br>T1         |
| GROUP 7:  | AMINES, ALIPHATIC AND AROMATIC<br>Pyridine   | T2                               |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonia<br>Ammonium hydroxide<br>Sodium hydroxide                    | T<br>T<br>T                      |
| GROUP 11: | CYANIDES<br>Cyanide  | T2                               |
| GROUP 14: | ETHERS<br>0100 Liquid  | T                                |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>0200 Liquid<br>Calcium fluoride<br>Sodium fluoride       | T<br>T<br>T                      |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Benzene<br>Ethyl benzene<br>Toluene<br>1,2,4-Trimethylbenzene<br>1,3,5-Trimethylbenzene<br>Xylene                        | T1<br>T1<br>T1<br>T1<br>T1<br>T1 |

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METAL WASTE

|           |   |   |
|-----------|---|---|
| GROUP 17: | HALOGENATED ORGANICS<br>0100 Liquid<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Methylene chloride   | T<br>T1<br>T1<br>T1<br>T1<br>T1   |
| GROUP 19: | KETONES<br>Acetone<br>2-Butanone<br>Methyl isobutyl ketone  | T1<br>T1<br>T1  |
| GROUP 20: | MERCAPTANS AND OTHER ORGANIC SULFIDES<br>Carbon disulfide   | T1  |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Lithium  | T1<br>T1  |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Nickel<br>Selenium  | T1<br>T2  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Antimony<br>Cadmium<br>Chromium<br>Copper<br>Depleted uranium<br>Iron<br>Lead<br>Selenium<br>Steel<br>Stainless Steel<br>Tantalum<br>Tungsten<br>Zinc-Magnesium Alloy | D<br>T2<br>T1<br>T1<br>D<br>D<br>D<br>D<br>D<br>T2<br>D<br>D<br>D<br>D<br>D |



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METAL WASTE

|            |   |   |
|------------|---|---|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Antimony<br>Arsenic<br>Barium<br>Beryllium<br>Boron trifluoride<br>Cadmium<br>Cerium nitrate<br>Chromium<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Potassium permanganate<br>Selenium<br>Silver<br>Thallium  | T2<br>T2<br>T1<br>T<br>T<br>T1<br>T<br>T1<br>D<br>D<br>T2<br>T1<br>T<br>T2<br>T<br>T2 |
| GROUP 28:  | HYDROCARBON, ALIPHATIC UNSATURATED<br>Polypropylene   | T   |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED<br>Cyclohexane  | T1  |
| GROUP 31:  | PHENOLS AND CRESOLS<br>Phenol   | T2  |
| GROUP 33:  | SULFIDES, INORGANIC<br>Sulfide  | T1  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Celotex (Packaging material)<br>Insulation<br>Neoprene<br>Oil<br>Paint<br>Polyamides<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polyurethane<br>Polyvinyl chloride (Packaging material)<br>Rubber<br>Teflon<br>Wood | D<br>T<br>T<br>T<br>T<br>T<br>M<br>T<br>T<br>M<br>T<br>T<br>T                         |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Cerium nitrate<br>Potassium permanganate  | T<br>T  |

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METAL WASTE

|  |  |   |
|--|--|---|
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Water   | T   |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Boron trifluoride<br>Lithium<br>Sulfuric acid (>70%)  | T1<br>T<br>T1<br>T  |
| OTHER ORGANICS                           | Carboline Neoprene F1 Adhesive Tubegrade<br>Dykem Blue<br>Firedam Spray fixative coating<br>Hydroxylamine hydrochloride<br>Impression compound<br>K W Cleaner<br>Mariko<br>Nochar Acid Bond<br>Nochar Petro Bond<br>Oxalate<br>Soap<br>Waste Lock 770™<br>WaterWorks Crystals® | T<br>T2<br>T<br>T<br>T<br>T<br>T1<br>T<br>T<br>T<br>T<br>T<br>T |
| OTHER INORGANICS                         | Asbestos<br>Ammonium chloride<br>Ceramics<br>Fiberglass<br>Filter media<br>Fuller's Earth<br>Glass<br>Insulation<br>Kathene<br>Silicone  | D<br>T<br>M<br>M<br>M<br>M<br>M<br>M<br>M<br>T1<br>T            |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Abzorbit<br>AquaSorbe-HP<br>Oil-Dri  | M<br>T<br>M   |

Refer to Introduction for a description of the designations used in this chemical list.

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GLASS WASTE

|           |  |  |
|-----------|--|--|
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid   | T  |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Cyclohexanediaminetetraacetic acid (CDTA)  | T2   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethanol<br>Ethylene glycol<br>Isopropanol<br>Methanol  | T1<br>T1<br>T2<br>T1                         |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Potassium hydroxide<br>Sodium hydroxide  | T<br>T                                       |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Benzene<br>Ethylbenzene<br>Toluene<br>Xylene   | T1<br>T1<br>T1<br>T1                         |
| GROUP 17: | HALOGENATED ORGANICS<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Methylene chloride<br>Tetrachloroethylene<br>Trichloroethylene | T2<br>T3<br>T3<br>T3<br>T1<br>T1<br>T2<br>T2 |
| GROUP 19: | KETONES<br>Acetone<br>2-Butanone   | T1<br>T1                                     |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Calcium (Metal)<br>Magnesium<br>Sodium  | T2<br>T2<br>T2<br>T                          |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Magnesium<br>Nickel<br>Selenium  | T2<br>T2<br>T2                               |

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GLASS WASTE

|            |  |  |
|------------|--|--|
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Chromium<br>Copper<br>Lead<br>Selenium<br>Steel<br>Tungsten<br>Zinc-Magnesium Alloy | T<br>T2<br>T2<br>T1<br>D<br>T2<br>T<br>T<br>D                      |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Barium<br>Beryllium<br>Cadmium<br>Calcium<br>Chromium<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Potassium permanganate<br>Selenium<br>Silver        | T2<br>T1<br>T2<br>T2<br>T2<br>T1<br>D<br>T2<br>T2<br>T<br>T2<br>T2 |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED<br>Cyclohexane   | T1   |
| GROUP 31:  | PHENOLS AND CRESOLS<br>2,4,6-Trichlorophenol   | T2   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Celotex (Packaging material)<br>Oil<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)                | D<br>T<br>M<br>M   |
| GROUP 102: | EXPLOSIVES<br>Calcium (metal)  | T2   |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Potassium permanganate   | T  |
| GROUP 105: | REDUCING AGENTS, STRONG<br>Calcium (Metal)<br>Sodium   | T2<br>T  |

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GLASS WASTE

|  |   |    |
|--|---|----|
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.) |    |
|  | Barium  | T2 |
|  | Calcium (Metal)   | T2 |
|  | Sodium  | T  |
| OTHER ORGANICS                           |   |    |
|  | Carboline Neoprene F1 Adhesive Tubegrade  | T  |
|  | Impression compound   | T  |
|  | Mariko  | T1 |
|  | Nochar Acid Bond  | T  |
|  | Nochar Petro Bond   | T  |
|  | Spent developer   | T  |
|  | Spent emulsifier  | T  |
|  | Spent X-ray developer/starter   | T  |
|  | Trimsol   | T  |
|  | Triple Ionic Strength Adjustment Buffer (TISAB)   | T  |
|  | Waste Lock 770™   | T  |
|  | WaterWorks Crystals®  | T  |
| OTHER INORGANICS                         |   |    |
|  | Calcium chloride  | M  |
|  | Cesium chloride   | M  |
|  | Diamond Paste   | T  |
|  | Glass, labware  | D  |
|  | Glass, raschig rings  | D  |
|  | Kathene   | T2 |
|  | Magnesium chloride  | M  |
|  | Magnesium oxide   | D  |
|  | Ceramic (Molds and Crucibles)   | D  |
|  | Oakite  | T1 |
|  | Potassium chloride  | M  |
|  | Silica oxide  | D  |
|  | Sodium chloride   | M  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |    |
|  | Absorbent polymers  | T  |
|  | Cement  | D  |
|  | Oil-Dri   | D  |

Refer to Introduction for a description of the designations used in this chemical list.

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Rocky Flats Environmental Technology Site  
List of Chemicals and Materials  
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FILTER WASTE

|           |   |   |
|-----------|---|---|
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid (Absorbed)<br>Mineral acids (Absorbed)   | M<br>M                                  |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Ethyl alcohol<br>Methanol   | T<br>T                                  |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Potassium hydroxide   | T                                       |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Potassium fluoride  | T<br>T                                  |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Toluene   | T2                                      |
| GROUP 17: | HALOGENATED ORGANICS<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Methylene chloride                          | T2<br>T1<br>T1<br>T1<br>T1<br>T1<br>T2  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Chromium<br>Lead<br>Metal cans<br>Stainless Steel<br>Tinned steel<br>Zinc-Magnesium Alloy | D<br>T2<br>T1<br>T1<br>D<br>M<br>M<br>T |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Cadmium<br>Chromium<br>Lead  | T2<br>T2<br>T2<br>T1<br>T1              |

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FILTER WASTE

|  |  |                                      |
|--|--|--------------------------------------|
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Celotex (Packaging materials)<br>Granular activated carbon<br>Grease<br>Oil<br>Polyethylene (Packaging material)<br>Polypropylene (Ful-Flo Filters)<br>Polyvinyl chloride (Packaging material)<br>Wood | D<br>M<br>D<br>D<br>M<br>D<br>M<br>D |
| GROUP 104:                               | OXIDIZING AGENTS, STRONG<br>(Constituents reacted to loading in payload containers.)<br>Hydrogen peroxide  | T1                                   |
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Water   | D                                    |
| OTHER ORGANICS                           | Nochar Acid Bond<br>Nochar Petro Bond<br>Waste Lock 770™<br>WaterWorks Crystals®   | M<br>M<br>M<br>M                     |
| OTHER INORGANICS                         | Fuller's Earth<br>Grit<br>HEPA Filters (Or filter media)<br>Other fiber filters<br>Other filters<br>Plenum Prefilters (Fiberglass)<br>Poly-fiber-wound cartridges  | M<br>T<br>D<br>D<br>D<br>D<br>D      |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Absorbent polymers<br>Abzorbit<br>AquaSorbe-HP<br>Oil-Dri<br>Cement (Hydrated)   | D<br>M<br>M<br>D<br>D                |

Refer to Introduction for a description of the designations used in this chemical list.



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ORGANIC SOLID WASTE

|           |  |                                  |
|-----------|--|----------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid   | T                                |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>0300 Liquid<br>Nitric acid<br>Sulfamic acid                         | T<br>M<br>T                      |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>0200 Liquid  | T                                |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>0100 Liquid<br>Butanol<br>Ethyl alcohol<br>Isobutyl alcohol<br>Methanol  | T<br>T1<br>T<br>T1<br>T1         |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonia<br>Ammonium hydroxide<br>Potassium hydroxide<br>Sodium hydroxide             | T<br>T<br>T<br>T                 |
| GROUP 14: | ETHERS<br>0100 Liquid  | T                                |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>0200 Liquid<br>Calcium fluoride<br>Potassium fluoride<br>Sodium fluoride | T<br>T<br>T<br>T                 |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>1,2,4-Trimethylbenzene<br>1,3,5-Trimethylbenzene<br>Benzene<br>Ethylbenzene<br>Toluene<br>Xylene   | T1<br>T1<br>T1<br>T1<br>T1<br>T1 |

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ORGANIC SOLID WASTE

|           |  |    |
|-----------|--|----|
| GROUP 17: | HALOGENATED ORGANICS   |    |
|           | 0100 Liquid  | T  |
|           | 1,1-Dichloroethane   | T1 |
|           | 1,1-Dichloroethene   | T1 |
|           | 1,2-Dichloroethane   | T2 |
|           | 1,2-Dichloroethylene   | T1 |
|           | 1,1,1-Trichloroethane  | T  |
|           | 1,1,2-Trichloro-1,2,2-trifluoroethane  | T  |
|           | cis-1,2-Dichloroethene   | T2 |
|           | Carbon tetrachloride   | T  |
|           | Chloroform   | T1 |
|           | Methylene chloride   | T1 |
|           | Tetrachloroethylene  | T1 |
|           | Trichloroethylene  | T1 |
| GROUP 19: | KETONES  |    |
|           | 2-Butanone   | T1 |
|           | Acetone  | T1 |
| GROUP 20: | MERCAPTANS AND OTHER ORGANIC SULFIDES  |    |
|           | Carbon disulfide   | T1 |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL<br>(Constituents reacted prior to loading in payload containers.) |    |
|           | Barium   | T1 |
|           | Batteries  | M  |
|           | Lithium  | T1 |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES                               |    |
|           | Nickel   | T1 |
|           | Selenium   | T2 |

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ORGANIC SOLID WASTE

|           |   |  |
|-----------|---|--|
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOY, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Aluminum alloys<br>Antimony<br>Cadmium<br>Chromium<br>Copper<br>Graphite<br>Iron<br>Lead<br>Selenium<br>Stainless steel<br>Steel<br>Tantalum<br>Tungsten<br>Zinc-Magnesium Alloy | <br>D<br>D<br>T2<br>T1<br>T1<br>D<br>M<br>D<br>D<br>T2<br>D<br>D<br>T<br>T<br>T    |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Antimony<br>Arsenic<br>Barium<br>Beryllium<br>Boron trifluoride<br>Cadmium<br>Cerium nitrate<br>Chromium<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Potassium permanganate<br>Selenium<br>Silver                                      | <br>T2<br>T2<br>T1<br>T<br>T<br>T1<br>T<br>T1<br>D<br>D<br>T<br>T1<br>T<br>T2<br>T |
| GROUP 28: | HYDROCARBON, ALIPHATIC UNSATURATED<br>Polypropylene   | <br>M  |
| GROUP 29: | HYDROCARBON, ALIPHATIC, SATURATED<br>Cyclohexane<br>Hexane  | <br>T1<br>T1   |

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ORGANIC SOLID WASTE

|            |   |    |
|------------|---|----|
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS  |    |
|            | Asphalt   | D  |
|            | Benelex   | D  |
|            | Cardboard   | D  |
|            | Celotex (Packaging material)  | D  |
|            | Fiberglass  | M  |
|            | Filter media  | M  |
|            | Granular activated carbon   | M  |
|            | Grease  | D  |
|            | HEPA filters  | M  |
|            | Insulation  | M  |
|            | Ion exchange resin  | D  |
|            | Leather   | T  |
|            | Neoprene  | M  |
|            | Oil   | D  |
|            | Paint   | T  |
|            | Phenolic resins   | T  |
|            | Plexiglass  | D  |
|            | Polyamides  | M  |
|            | Polyethylene (Packaging material)   | D  |
|            | Polymethyl methacrylate   | D  |
|            | Polypropylene   | M  |
|            | Polystyrene   | M  |
|            | Polyurethane  | M  |
|            | Polyvinyl chloride (Packaging material)   | D  |
|            | Rags and cloth  | D  |
|            | Rubber  | M  |
|            | Teflon  | M  |
|            | Tygon tubing  | M  |
|            | Wood  | D  |
| GROUP 104: | OXIDIZING AGENTS, STRONG  |    |
|            | Aluminum nitrate  | T1 |
|            | Calcium nitrate   | T1 |
|            | Cerium nitrate  | T  |
|            | Hydrogen peroxide   | T2 |
|            | Potassium permanganate  | T  |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER   |    |
|            | Water   | D  |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.) |    |
|            | Barium  | T1 |
|            | Boron trifluoride   | T  |
|            | Lithium   | T1 |
|            | Sulfamic acid   | T  |

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## ORGANIC SOLID WASTE

|  |    |
|--|----|
| OTHER ORGANICS                           |    |
| Butyl diglyme                            | T2 |
| Carboline Neoprene F1 Adhesive Tubegrade | T  |
| Firedam spray fixative coating           | T  |
| K W Cleaner                              | T  |
| Mariko                                   | T1 |
| Nochar Acid Bond                         | M  |
| Nochar Petro Bond                        | M  |
| Soap                                     | T  |
| Waste Lock 770™                          | M  |
| WaterWorks Crystals®                     | M  |
| OTHER INORGANICS                         |    |
| Asbestos                                 | D  |
| Ash                                      | D  |
| Ceramics                                 | M  |
| Fiberglass                               | M  |
| Fuller's Earth                           | M  |
| Glass                                    | D  |
| HEPA filters                             | M  |
| Insulation                               | M  |
| Kathene                                  | T1 |
| Sand                                     | D  |
| Silicone                                 | M  |
| Soil                                     | D  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |    |
| Abzorbit                                 | M  |
| AquaSorbe-HP                             | M  |
| Concrete                                 | D  |
| Oil-Dri                                  | D  |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLID INORGANIC WASTE

|           |   |                          |
|-----------|---|--------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid  | T                        |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)                                  | T<br>T                   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Methanol  | T1                       |
| GROUP 7:  | AMINES, ALIPHATIC AND AROMATIC<br>Pyridine  | T2                       |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonia<br>Ammonium hydroxide<br>Calcium oxide (Oxidized calcium)<br>Sodium hydroxide | T<br>T<br>D<br>T         |
| GROUP 11: | CYANIDES<br>Cyanide   | T1                       |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Toluene   | T2                       |
| GROUP 17: | HALOGENATED ORGANICS<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride          | T2<br>T<br>T<br>T1<br>T1 |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium   | T2                       |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Nickel<br>Selenium  | T<br>T2                  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Antimony<br>Copper<br>Iron<br>Iron Tin (Alloy)  | T2<br>T<br>T<br>M        |

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SOLID INORGANIC WASTE

|            |  |   |
|------------|--|---|
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC. (Continued)<br>Lead<br>Low carbon steel<br>Selenium<br>Stainless Steel<br>Tin<br>Titanium<br>Zinc-Magnesium Alloy                                     | T<br>M<br>T2<br>M<br>T<br>T<br>D  |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Antimony<br>Barium<br>Beryllium<br>Boron trifluoride<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Potassium dichromate<br>Potassium permanganate<br>Selenium<br>Silver<br>Thallium<br>Titanium | T2<br>T2<br>T2<br>T<br>T<br>T<br>T2<br>T<br>T<br>T<br>T2<br>T2<br>T2<br>T |
| GROUP 31:  | PHENOLS AND CRESOLS<br>Phenol  | T2  |
| GROUP 33:  | SULFIDES, INORGANIC<br>Sulfide   | T   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Celotex (Packaging material)<br>Cloth<br>Leather<br>Paper<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)<br>Rubber                        | D<br>T<br>T<br>T<br>M<br>M<br>T   |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Potassium dichromate<br>Potassium permanganate   | T<br>T  |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Water   | T   |



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SOLID INORGANIC WASTE

|  |   |
|--|---|
| <p>GROUP 107: WATER REACTIVE SUBSTANCES<br/>(Constituents reacted prior to loading in payload containers.)<br/>Barium<br/>Boron trifluoride<br/>Calcium oxide (Oxidized Calcium)<br/>Sulfuric acid (&gt;70%)</p>   | <p>T2<br/>T<br/>D<br/>T</p>   |
| <p>OTHER ORGANICS<br/>Carboline Neoprene F1 Adhesive Tubegrade<br/>Hydroxylamine hydrochloride<br/>Mariko<br/>Nochar Acid Bond<br/>Nochar Petro Bond<br/>Waste Lock 770™<br/>WaterWorks Crystals®</p>  | <p>T<br/>T1<br/>T<br/>T<br/>T<br/>T<br/>T</p>   |
| <p>OTHER INORGANICS<br/>Ammonium chloride<br/>Ammonium DTPA<br/>Asbestos<br/>Crucibles<br/>Fire blankets<br/>Firebrick<br/>Firebrick heel<br/>Fuller's Earth<br/>Glass<br/>Grit<br/>Insulation<br/>Miscellaneous oxides<br/>Oxalate<br/>Sand<br/>Sand (Slag and Crucible heel)<br/>Slag<br/>Soot</p> | <p>T<br/>T2<br/>D<br/>D<br/>D<br/>D<br/>D<br/>D<br/>M<br/>D<br/>D<br/>D<br/>D<br/>T<br/>D<br/>D<br/>D<br/>D</p> |
| <p>OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br/>Abzorbit<br/>AquaSorbe-HP<br/>Oil-Dri</p>  | <p>M<br/>T<br/>D</p>  |

Refer to Introduction for a description of the designations used in this chemical list.

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LEADED RUBBER

|                |   |                                 |
|----------------|---|---------------------------------|
| GROUP 10:      | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Potassium hydroxide   | T                               |
| GROUP 16:      | HYDROCARBONS, AROMATIC<br>Toluene   | T2                              |
| GROUP 17:      | HALOGENATED ORGANICS<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride          | T2<br>T<br>T<br>T<br>T          |
| GROUP 22:      | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS OR SPONGES<br>Nickel   | T2                              |
| GROUP 23:      | METALS, OTHER ELEMENTAL AND ALLOY, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Cadmium<br>Chromium<br>Lead (rubber gloves)<br>Zinc-Magnesium Alloy                 | T2<br>T2<br>D<br>T              |
| GROUP 24:      | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Cadmium<br>Chromium<br>Lead (Rubber gloves)<br>Nickel  | T2<br>T2<br>T2<br>T2<br>D<br>T2 |
| GROUP 101:     | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Celotex (Packaging material)<br>Grease<br>Oil<br>Polyethylene<br>Polyvinyl chloride<br>Rubber gloves (Leaded) | D<br>D<br>D<br>T<br>T<br>D      |
| OTHER ORGANICS | De-Solv-it<br>Impression compound<br>Nochar Acid Bond<br>Nochar Petro Bond<br>Waste Lock 770™<br>WaterWorks Crystals®   | T2<br>T<br>M<br>M<br>M<br>M     |

Refer to Introduction for a description of the designations used in this chemical list.

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PYROCHEMICAL SALT WASTE

|           |  |   |
|-----------|--|---|
| GROUP 10: | CAUSTICS<br>(Constituents dispersed in chloride salts.)<br>Calcium oxide<br>Sodium carbonate<br>Sodium oxide   | M<br>M<br>M   |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Calcium<br>Magnesium  | T3<br>M<br>M  |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Aluminum<br>Cobalt<br>Magnesium<br>Manganese<br>Nickel<br>Selenium<br>Titanium<br>Zinc   | T1<br>T2<br>M<br>T2<br>T1<br>T3<br>T1<br>T1                                   |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOY, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Antimony<br>Cadmium<br>Chromium<br>Cobalt<br>Copper<br>Iron<br>Metal cans (For salt)<br>Lead<br>Manganese<br>Selenium<br>Titanium<br>Zinc<br>Zinc-Magnesium Alloy | T1<br>T2<br>T3<br>T1<br>T2<br>T2<br>T<br>M<br>T2<br>T2<br>T3<br>T1<br>T1<br>D |

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PYROCHEMICAL SALT WASTE

|                |  |    |
|----------------|--|----|
| GROUP 24:      | METALS AND METAL COMPOUNDS, TOXIC  |    |
|                | Antimony   | T2 |
|                | Arsenic  | T3 |
|                | Barium   | T3 |
|                | Beryllium  | T2 |
|                | Cadmium  | T3 |
|                | Calcium  | M  |
|                | Chromium   | T1 |
|                | Cobalt   | T2 |
|                | Copper   | T2 |
|                | Lead   | T2 |
|                | Manganese  | T2 |
|                | Nickel   | T1 |
|                | Selenium   | T3 |
|                | Silver   | T2 |
|                | Strontium  | T2 |
|                | Thallium   | T2 |
|                | Titanium   | T1 |
|                | Vanadium   | T2 |
|                | Zinc   | T1 |
| GROUP 101:     | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS                       |    |
|                | Celotex (Packaging material)   | D  |
|                | Polyethylene (Packaging material)  | T  |
|                | Polyvinyl chloride (Packaging material)                                  | T  |
| GROUP 102:     | EXPLOSIVES   |    |
|                | Calcium  | M  |
| GROUP 105:     | REDUCING AGENTS, STRONG  |    |
|                | Calcium  | M  |
|                | Phosphorous  | T1 |
| GROUP 106:     | WATER AND MIXTURES CONTAINING WATER                                      |    |
|                | Water  | T  |
| GROUP 107:     | WATER REACTIVE SUBSTANCES<br>(Constituents dispersed in chloride salts.) |    |
|                | Barium   | T3 |
|                | Calcium  | M  |
|                | Calcium oxide  | M  |
|                | Phosphorous  | T1 |
|                | Sodium oxide   | M  |
| OTHER ORGANICS |  |    |
|                | Nochar Acid Bond   | T  |
|                | Nochar Petro Bond  | T  |
|                | Waste Lock 770™  | T  |
|                | WaterWorks Crystals®   | T  |

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## PYROCHEMICAL SALT WASTE

|                    |   |
|--------------------|---|
| OTHER INORGANICS   |   |
| Calcium chloride   | D |
| Cesium chloride    | D |
| Magnesium chloride | D |
| Magnesium oxide    | M |
| Magnetite          | T |
| Potassium chloride | D |
| Sodium chloride    | D |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLIDIFIED ORGANIC PROCESS SOLIDS

|           |   |                                      |
|-----------|---|--------------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrofluoric acid  | T                                    |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isopropanol<br>Methanol   | T2<br>T2<br>T2<br>T2                 |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Hydrofluoric acid                                      | T<br>T                               |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Ethyl benzene<br>Toluene<br>Xylene  | T2<br>T2<br>T2                       |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride                                  | T1<br>T1<br>T1<br>T1                 |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Nickel<br>Selenium  | T2<br>T1                             |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOY, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Cadmium<br>Chromium<br>Iron<br>Lead<br>Metal cans<br>Selenium<br>Zinc-Magnesium Alloy | T1<br>T2<br>T2<br>T2<br>D<br>T1<br>T |

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SOLIDIFIED ORGANIC PROCESS SOLIDS

|  |   |  |
|--|---|--|
| GROUP 24:                                | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Cadmium<br>Chromium<br>Lead<br>Mercury<br>Nickel<br>Selenium<br>Silver                             | T1<br>T1<br>T1<br>T2<br>T2<br>T1<br>T2<br>T1<br>T1 |
| GROUP 32:                                | ORGANOPHOSPHATES, PHOSPHOTHIOATES, AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate   | T  |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Celotex (Packaging material)<br>Grease<br>Ion exchange resin<br>Oil<br>Polyethylene<br>Polyvinyl chloride | D<br>D<br>D<br>D<br>T<br>T                         |
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Water  | M  |
| OTHER ORGANICS                           | Nochar Acid Bond<br>Nochar Petro Bond<br>Waste Lock 770™<br>WaterWorks Crystals®  | M<br>M<br>M<br>M                                   |
| OTHER INORGANICS                         | Aluminum nitrate<br>Ferrous sulfamate   | T<br>T   |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Absorbent polymers<br>Flocculating agents<br>Cement (Portland and Magnesia)<br>Oil-Dry  | M<br>T<br>D<br>D                                   |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU COMBINED SOLID ORGANICS, SOLID INORGANICS, AND SOLIDIFIED INORGANICS

|           |  |                                  |
|-----------|--|----------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid   | T                                |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric Acid<br>Sulfuric acid (<70%)<br>Tetraphosphoric acid                                   | T<br>T<br>T1                     |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium (Diethylene triamine) pentaacetic acid<br>Oxalic acid<br>Ethylenediaminetetraacetic acid (EDTA) | T<br>T1<br>T2                    |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isobutyl alcohol<br>Isopropanol<br>Methanol  | T2<br>T2<br>T1<br>T2<br>T2       |
| GROUP 7:  | AMINES, ALIPHATIC AND AROMATIC<br>Pyridine   | T2                               |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonia<br>Ammonium hydroxide<br>Sodium hydroxide  | T<br>T<br>T                      |
| GROUP 11: | CYANIDES<br>Cyanide  | T1                               |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Sodium fluoride  | T<br>T                           |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>1,2,4-Trimethylbenzene<br>1,3,5-Trimethylbenzene<br>Benzene<br>Ethyl benzene<br>Toluene<br>Xylene  | T1<br>T1<br>T1<br>T2<br>T2<br>T2 |

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TRU COMBINED SOLID ORGANICS, SOLID INORGANICS, AND SOLIDIFIED INORGANICS\*

|           |   |   |
|-----------|---|---|
| GROUP 17: | HALOGENATED ORGANICS<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Methylene chloride<br>Tetrachloroethylene<br>Trichloroethylene  | T2<br>T2<br>T1<br>T2<br>T1<br>T1<br>T1<br>T1                            |
| GROUP 19: | KETONES<br>2-Butanone<br>Acetone<br>Methyl isobutyl ketone  | T1<br>T1<br>T1  |
| GROUP 20: | MERCAPTANS AND OTHER ORGANIC SULFIDES<br>Carbon disulfide   | T1  |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Lithium<br>Magnesium   | T1<br>T1<br>T1  |
| GROUP 22: | METALS OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Magnesium<br>Nickel<br>Selenium  | T1<br>T1<br>T1  |
| GROUP 23: | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Antimony<br>Cadmium<br>Chromium<br>Copper<br>Depleted uranium<br>Iron<br>Lead<br>Selenium<br>Steel<br>Stainless steel<br>Tantalum<br>Tungsten<br>Zinc-Magnesium Alloy | D<br>T2<br>T2<br>T1<br>D<br>D<br>T1<br>T<br>T1<br>D<br>D<br>D<br>D<br>T |

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TRU COMBINED SOLID ORGANICS, SOLID INORGANICS, AND SOLIDIFIED INORGANICS\*

|            |   |   |
|------------|---|---|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Antimony<br>Arsenic<br>Barium<br>Beryllium<br>Cadmium<br>Cerium nitrate<br>Chromium<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Potassium permanganate<br>Selenium<br>Silver<br>Thallium | T2<br>T1<br>T1<br>T2<br>T2<br>D<br>T1<br>D<br>T<br>T1<br>T1<br>T<br>T1<br>T<br>T2 |
| GROUP 28:  | HYDROCARBON, ALIPHATIC, SATURATED<br>Polypropylene  | T   |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED<br>Cyclohexane  | T1  |
| GROUP 31:  | PHENOLS AND CRESOLS<br>Phenol   | T2  |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate  | T3  |
| GROUP 33:  | SULFIDES, INORGANIC<br>Sulfide  | T1  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Celotex (Packaging material)<br>Grease<br>Oil<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polyvinyl chloride (Packaging material)<br>Resin  | T<br>D<br>D<br>D<br>M<br>T<br>M<br>T  |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Cerium nitrate<br>Potassium permanganate  | D<br>T  |

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TRU COMBINED SOLID ORGANICS, SOLID INORGANICS, AND SOLIDIFIED INORGANICS\*

|  |   |   |
|--|---|---|
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures (Fixed in matrix)<br>Sludge (Fixed in matrix)<br>Water  | T<br>D<br>D   |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Lithium<br>Sulfuric acid (>70%)  | T1<br>T1<br>T   |
| OTHER ORGANICS                           | Dykem Blue<br>Firedam Spray fixative coating<br>Flocculating agent (Polyelectrolyte)<br>Hydroxylamine hydrochloride<br>Impression compound<br>KW Cleaner<br>Mariko<br>Nochar Acid Bond<br>Nochar Petro Bond<br>Oxalate<br>Soap<br>Waste Lock 770™<br>WaterWorks Crystals® | T2<br>T<br>T<br>T<br>T<br>T<br>T1<br>D<br>M<br>T<br>T<br>D<br>D |
| OTHER INORGANICS                         | Ammonium chloride<br>Asbestos<br>Firebrick<br>Glass<br>Insulation<br>Kathene<br>Molds and Crucibles<br>Soot   | T<br>D<br>T<br>T<br>T<br>T1<br>T<br>T                           |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Diatomite<br>Oil-Dry<br>Portland Cement (Hydrated)<br>Ramcote Cement (Hydrated)   | D<br>D<br>D<br>D  |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLID INORGANIC WITH RESIDUAL ORGANIC WASTE\*

|           |   |   |
|-----------|---|---|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid  | T   |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>0300 Liquid  | T   |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>0200 Liquid   | T   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>0100 Liquid<br>Butanol<br>Methanol  | T<br>T2<br>T2                               |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium oxide                                  | M<br>T1<br>M<br>M                           |
| GROUP 14: | ETHERS<br>0100 Liquid   | T   |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>0200 Liquid<br>Calcium fluoride<br>Sodium fluoride  | T<br>M<br>T1                                |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Aromatic polyamide fibers<br>Benzene<br>Toluene<br>Xylene   | T1<br>T1<br>T2<br>T2                        |
| GROUP 17: | HALOGENATED ORGANICS<br>0100 Liquid<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Methylene chloride | T<br>T2<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1 |
| GROUP 20: | MERCAPTANS AND OTHER ORGANIC SULFIDES<br>Carbon disulfide   | T1  |

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## SOLID INORGANIC WITH RESIDUAL ORGANIC WASTE\*

|           |   |  |
|-----------|---|--|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Calcium<br>Magnesium   | T3<br>M<br>M   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Aluminum<br>Cobalt<br>Magnesium<br>Manganese<br>Nickel<br>Selenium<br>Titanium<br>Zinc  | T1<br>T2<br>M<br>T2<br>T1<br>T3<br>T1<br>T1  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Aluminum alloys<br>Antimony<br>Cadmium<br>Chromium<br>Cobalt<br>Copper<br>Graphite<br>Iron<br>Lead<br>Low carbon steel<br>Manganese<br>Selenium<br>Titanium<br>Zinc<br>Zinc-Magnesium Alloy | D<br>D<br>T2<br>T2<br>T1<br>T2<br>M<br>T<br>D<br>D<br>M<br>T2<br>T3<br>T1<br>T1<br>T |



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SOLID INORGANIC WITH RESIDUAL ORGANIC WASTE\*

|            |  |    |
|------------|--|----|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC                  |    |
|            | Antimony   | T2 |
|            | Arsenic  | T2 |
|            | Barium   | T3 |
|            | Beryllium  | T  |
|            | Boron trifluoride                                  | T  |
|            | Cadmium  | T2 |
|            | Calcium  | M  |
|            | Cerium nitrate                                     | T  |
|            | Chromium   | T1 |
|            | Cobalt   | T2 |
|            | Copper   | M  |
|            | Lead   | D  |
|            | Manganese  | T2 |
|            | Metal cans   | D  |
|            | Nickel   | T1 |
|            | Potassium dichromate                               | T  |
|            | Selenium   | T3 |
|            | Silver   | T2 |
|            | Strontium  | T2 |
|            | Thallium   | T2 |
|            | Titanium   | T1 |
|            | Vanadium   | T2 |
|            | Zinc   | T1 |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS |    |
|            | Adhesive   | T  |
|            | Celotex (Packaging material)                       | D  |
|            | Epoxy  | T  |
|            | Grease   | D  |
|            | Insulation   | M  |
|            | Leather  | T  |
|            | Neoprene   | M  |
|            | Oil  | D  |
|            | Paint  | M  |
|            | Paper  | M  |
|            | Polyethylene (Packaging material)                  | T  |
|            | Polyurethane sealant (Or other sealant)            | T  |
|            | Polyvinyl chloride (Packaging material)            | T  |
|            | Rags and Cloth                                     | M  |
|            | Synthetic rubber                                   | M  |
|            | Teflon   | M  |
|            | Thermoset vinyl                                    | T  |
|            | Wood   | M  |
| GROUP 102: | EXPLOSIVES   |    |
|            | Calcium  | M  |

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SOLID INORGANIC WITH RESIDUAL ORGANIC WASTE\*

|                |   |                              |
|----------------|---|------------------------------|
| GROUP 104:     | OXIDIZING AGENTS, STRONG<br>Aluminum nitrate<br>Cerium nitrate<br>Potassium dichromate  | T1<br>T<br>T                 |
| GROUP 105:     | REDUCING AGENTS, STRONG<br>Calcium<br>Phosphorous   | M<br>T1                      |
| GROUP 106:     | WATER AND MIXTURES CONTAINING WATER<br>Water  | M                            |
| GROUP 107:     | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Boron trifluoride<br>Calcium<br>Calcium oxide<br>Phosphorous<br>Sodium oxide | T3<br>T<br>M<br>M<br>T1<br>M |
| OTHER ORGANICS | Carboline Neoprene F1 Adhesive Tubegrade<br>Firedam spray fixative coating<br>Nochar Acid Bond<br>Nochar Petro Bond<br>Waste Lock 770™<br>WaterWorks Crystals®                        | T<br>T<br>M<br>M<br>M<br>M   |

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SOLID INORGANIC WITH RESIDUAL ORGANIC WASTE\*

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Asbestos                                 | M |
| Ash                                      | D |
| Ash heel                                 | D |
| Calcium chloride                         | D |
| Ceramics                                 | M |
| Cesium chloride                          | D |
| Fiberglass                               | D |
| Filter media                             | D |
| Firebrick                                | D |
| Fuller's Earth                           | M |
| Grit                                     | D |
| Glass                                    | D |
| HEPA Filters                             | D |
| Insulation                               | M |
| Magnesium chloride                       | D |
| Magnesium oxide                          | M |
| Magnetite                                | T |
| Other filters                            | D |
| Oxides                                   | D |
| Potassium chloride                       | D |
| Sand                                     | D |
| Silicone                                 | M |
| Slag                                     | D |
| Sodium chloride                          | D |
| Soot                                     | D |
| Soot heel                                | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Absorbent polymers                       | M |
| Abzorbit                                 | M |
| Aquasorbe-HP                             | M |
| Cement                                   | D |
| Glass                                    | D |
| Oil-Dri                                  | D |

Refer to Introduction for a description of the designations used in this chemical list.

\*The sum of the concentrations of water and organic materials must be less than or equal to 10 weight percent of the total waste.

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SOLID INORGANIC WASTE (GREATER THAN TRACE QUANTITIES OF BERYLLIUM)

|           |  |                                  |
|-----------|--|----------------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid                               | T                                |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfuric acid (<70%)                 | T<br>T                           |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium (Diethylene triamine) pentaacetic acid                | T                                |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethyl alcohol<br>Isobutyl alcohol<br>Methanol   | T1<br>T<br>T1<br>T1              |
| GROUP 7:  | AMINES, ALIPHATIC AND AROMATIC<br>Pyridine   | T2                               |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonia<br>Ammonium hydroxide<br>Sodium hydroxide                    | T<br>T<br>T                      |
| GROUP 11: | CYANIDES<br>Cyanide  | T2                               |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Sodium fluoride                      | T<br>T                           |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Benzene<br>Ethyl benzene<br>Toluene<br>1,2,4-Trimethylbenzene<br>1,3,5-Trimethylbenzene<br>Xylene                        | T1<br>T1<br>T1<br>T1<br>T1<br>T1 |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Methylene chloride | T1<br>T1<br>T1<br>T1<br>T1       |

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SOLID INORGANIC WASTE (GREATER THAN TRACE QUANTITIES OF BERYLLIUM)

|           |   |  |
|-----------|---|--|
| GROUP 19: | KETONES<br>Acetone<br>2-Butanone<br>Methyl isobutyl ketone  | T1<br>T1<br>T1   |
| GROUP 20: | MERCAPTANS AND OTHER ORGANIC SULFIDES<br>Carbon disulfide   | T1   |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Lithium  | T1<br>T1   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Nickel<br>Selenium  | T1<br>T2   |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Antimony<br>Cadmium<br>Chromium<br>Copper<br>Depleted uranium<br>Iron<br>Lead<br>Selenium<br>Steel<br>Stainless Steel<br>Tantalum<br>Tungsten<br>Zinc-Magnesium Alloy | D<br>T2<br>T1<br>T1<br>D<br>D<br>D<br>D<br>T2<br>D<br>D<br>D<br>D<br>D |

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SOLID INORGANIC WASTE (GREATER THAN TRACE QUANTITIES OF BERYLLIUM)

|            |  |  |
|------------|--|--|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Antimony<br>Arsenic<br>Barium<br>Beryllium<br>Boron trifluoride<br>Cadmium<br>Chromium<br>Copper<br>Lead<br>Mercury<br>Nickel<br>Potassium permanganate<br>Selenium<br>Silver<br>Thallium | T2<br>T2<br>T1<br>D<br>T<br>T1<br>T1<br>D<br>D<br>T2<br>T1<br>T<br>T2<br>T<br>T2 |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED<br>Cyclohexane   | T1   |
| GROUP 31:  | PHENOLS AND CRESOLS<br>Phenol  | T2   |
| GROUP 33:  | SULFIDES, INORGANIC<br>Sulfide   | T1   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Celotex (Packaging material)<br>Oil<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)  | D<br>T<br>M<br>M   |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Potassium permanganate   | T  |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Water   | T  |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Boron trifluoride<br>Lithium<br>Sulfuric acid (>70%)  | T1<br>T<br>T1<br>T   |

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SOLID INORGANIC WASTE (GREATER THAN TRACE QUANTITIES OF BERYLLIUM)

|  |    |
|--|----|
| OTHER ORGANICS                           |    |
| Carboline Neoprene F1 Adhesive Tubegrade | T  |
| Dykem Blue                               | T2 |
| Firedam Spray fixative coating           | T  |
| Hydroxylamine hydrochloride              | T  |
| Impression compound                      | T  |
| K W Cleaner                              | T  |
| Mariko                                   | T1 |
| Nochar Acid Bond                         | T  |
| Nochar Petro Bond                        | T  |
| Oxalate                                  | T  |
| Soap                                     | T  |
| Waste Lock 770™                          | T  |
| WaterWorks Crystals®                     | T  |
| OTHER INORGANICS                         |    |
| Asbestos                                 | D  |
| Ammonium chloride                        | T  |
| Kathene                                  | T1 |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |    |
| Oil-Dri                                  | M  |

Refer to Introduction for a description of the designations used in this chemical list.



Rocky Flats Environmental Technology Site  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code RF 132/232

SOLIDIFIED AQUEOUS WASTE/SLUDGE WASTE  
(GREATER THAN ONE WEIGHT PERCENT BERYLLIUM)

|           |  |  |
|-----------|--|--|
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Tetraphosphoric acid  | T1                                     |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Oxalic acid<br>Ethylenediaminetetraacetic acid (EDTA)  | T1<br>T2                               |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isopropanol<br>Methanol  | T2<br>T2<br>T2<br>T2                   |
| GROUP 11: | CYANIDES<br>Cyanide  | T1                                     |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Benzene<br>Ethyl benzene<br>Toluene<br>Xylene  | T1<br>T2<br>T2<br>T2                   |
| GROUP 17: | HALOGENATED ORGANICS<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride<br>Tetrachloroethylene<br>Trichloroethylene | T2<br>T2<br>T1<br>T2<br>T1<br>T1<br>T1 |
| GROUP 19: | KETONES<br>Acetone   | T1                                     |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>Barium<br>Magnesium   | T1<br>T1                               |
| GROUP 22: | METALS OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Magnesium<br>Selenium   | T1<br>T1                               |

Rocky Flats Environmental Technology Site  
List of Chemicals and Materials  
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Content Code RF 132/232  
(Continued)

SOLIDIFIED AQUEOUS WASTE/SLUDGE WASTE  
(GREATER THAN ONE WEIGHT PERCENT BERYLLIUM)

|                |   |                                      |
|----------------|---|--------------------------------------|
| GROUP 23:      | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Cadmium<br>Iron<br>Lead<br>Selenium<br>Zinc-Magnesium Alloy   | T2<br>T1<br>T<br>T1<br>T             |
| GROUP 24:      | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Barium<br>Beryllium<br>Cadmium<br>Lead<br>Mercury<br>Selenium   | T1<br>T1<br>M<br>T2<br>T<br>T1<br>T1 |
| GROUP 28:      | HYDROCARBON, ALPHATIC, SATURATED<br>Polypropylene   | T                                    |
| GROUP 32:      | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND PHOSPHODITHIOATES<br>Tributyl phosphate   | T3                                   |
| GROUP 101:     | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Celotex (Packaging material)<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polyvinyl chloride (Packaging material)<br>Resin | T<br>D<br>M<br>T<br>M<br>T           |
| GROUP 106:     | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures (Fixed in matrix)<br>Sludge (Fixed in matrix)<br>Water  | T<br>D<br>D                          |
| GROUP 107:     | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Barium   | T1                                   |
| OTHER ORGANICS | Flocculating agent (Polyelectrolyte)<br>Nochar Acid Bond<br>Waste Lock 770™<br>WaterWorks Crystals®   | T<br>T<br>T<br>T                     |

Rocky Flats Environmental Technology Site  
List of Chemicals and Materials  
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Content Code RF 132/232  
(Continued)

SOLIDIFIED AQUEOUS WASTE/SLUDGE WASTE  
(GREATER THAN ONE WEIGHT PERCENT BERYLLIUM)

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Firebrick                                | T |
| Fuller's Earth                           | M |
| Glass                                    | T |
| Insulation                               | T |
| Molds and Crucibles                      | T |
| Soot                                     | T |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Abzorbit                                 | M |
| Diatomite                                | D |
| Oil-Dry                                  | D |
| Portland Cement (Hydrated)               | D |
| Ramcote Cement (Hydrated)                | D |

Refer to Introduction for a description of the designations used in this chemical list.

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Richland Hanford  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code RH 111/211

SOLIDIFIED INORGANIC PROCESS SOLIDS AND SOLIDIFIED SS&C RESIDUES

|           |   |  |
|-----------|---|--|
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to closure of payload containers.)<br>Nitric acid<br>Plutonium nitrates (Pu/U, Pu/Th, Pu/Eu)   | D<br>D   |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butyl alcohol   | T  |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>Sodium hydroxide   | M<br>T   |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Sodium fluoride   | D<br>T2  |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Barium   | M<br>T   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Nickel<br>Selenium  | T<br>T   |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Cadmium<br>Chromium<br>Iron (Including Cemented Sludges)<br>Lead<br>Selenium                                       | T<br>D<br>T2<br>T<br>T                                   |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Barium<br>Boron<br>Cadmium<br>Calcium<br>Chromium<br>Gadolinium<br>Lead<br>Mercury<br>Nickel<br>Plutonium nitrates (Pu/U, Pu/Th, Pu/Eu)<br>Selenium | T<br>T<br>T<br>T<br>T<br>D<br>T<br>T<br>T<br>D<br>D<br>T |

Richland Hanford  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code RH 111/211  
(Continued)

SOLIDIFIED INORGANIC PROCESS SOLIDS AND SOLIDIFIED SS&C RESIDUES

|                  |  |   |
|------------------|--|---|
| GROUP 32:        | ORGANOPHOSPHATES, PHOSPHOTHIOATES, AND<br>PHOSPHODITHIOATES<br>Dibutyl phosphate<br>Monobutyl phosphate  | T<br>T  |
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Camel hair brush bristles<br>Nylon brush bristles<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material)  | T<br>T<br>D<br>D  |
| GROUP 104:       | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Aluminum nitrate nanohydrate<br>Sodium nitrate   | T<br>T  |
| GROUP 105:       | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium   | M   |
| GROUP 106:       | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Sludge  | T<br>T  |
| GROUP 107:       | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Calcium oxide   | T<br>M  |
| OTHER INORGANICS | Ash (ash bottoms, fly ash, soot)<br>Calcium iodide<br>Chlorides<br>Clay<br>Clean Up, Taft (amorphous silica)<br>Concrete and Graphite molds<br>Fiberglass and Fiberglass filter media<br>Firebrick<br>Glass<br>Grit<br>Heel (ash heel, soot heel, firebrick heel, sand, slag, and crucible heel)<br>Insulation<br>Magnesium hydroxide<br>Magnesium oxide<br>Plutonium oxide<br>Sand, Slag, and Crucible pieces | T<br>D<br>T<br>T<br>D<br>T<br>T<br>T<br>D<br>T<br>T<br>T<br>D<br>T<br>D |

Richland Hanford  
List of Chemicals and Materials  
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Content Code RH 111/211  
(Continued)

SOLIDIFIED INORGANIC PROCESS SOLIDS AND SOLIDIFIED SS&C RESIDUES

| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
|--|---|
| Celite                                   | T |
| Diatomaceous Earth                       | T |
| Diatomite                                | T |
| Florco                                   | T |
| Oil-Dri                                  | T |
| Perlite                                  | T |
| Petroset                                 | T |
| Portland cement                          | D |
| Vermiculite                              | T |

Refer to Introduction for a description of the designations used in this chemical list.

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Richland Hanford  
List of Chemicals and Materials  
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Content Code RH 112/212

SOLIDIFIED ORGANICS

|            |  |        |
|------------|--|--------|
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Trimethylbenzene<br>Xylene   | D<br>D |
| GROUP 17:  | HALOGENATED ORGANICS<br>Carbon tetrachloride   | D      |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC<br>Iron   | D      |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Chromium<br>Nickel  | D<br>D |
| GROUP 29:  | HYDROCARBONS, ALIPHATIC, SATURATED<br>N-Paraffin hydrocarbons (NPH)  | D      |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate<br>Trioctyl phosphine oxide                       | D<br>D |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material) | M<br>D |
|            | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Conwed pads<br>Non-ionic detergent   | D<br>D |

Refer to Introduction for a description of the designations used in this chemical list.

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Richland Hanford  
List of Chemicals and Materials  
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Content Code RH 114/214

SOLIDIFIED INORGANIC PROCESS SOLIDS AND SOLIDIFIED SS&C RESIDUES

|            |   |                  |
|------------|---|------------------|
| GROUP 2:   | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid  | D                |
| GROUP 10:  | CAUSTIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide  | D                |
| GROUP 15:  | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Sodium fluoride   | D<br>T2          |
| GROUP 21:  | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL<br>Calcium   | D                |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Chromium<br>Iron (Cemented sludges)  | D<br>T2          |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Calcium<br>Chromium<br>Nickel  | D<br>D<br>D      |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Camel hair brush bristles<br>Nylon brush bristles<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material) | T<br>T<br>D<br>D |
| GROUP 102: | EXPLOSIVES<br>Calcium   | D                |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Aluminum nitrate nanohydrate<br>Sodium nitrate  | T<br>T           |
| GROUP 105: | REDUCING AGENTS, STRONG<br>Calcium  | D                |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Sludge   | T<br>T           |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Calcium oxide   | D<br>D           |

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List of Chemicals and Materials  
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(Continued)

SOLIDIFIED INORGANIC PROCESS SOLIDS AND SOLIDIFIED SS&C RESIDUES

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Calcium iodide                           | D |
| Glass                                    | D |
| Magnesium oxide                          | D |
| Sand, Slag, and Crucible pieces          | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Portland Cement                          | D |

Refer to Introduction for a description of the designations used in this chemical list.

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List of Chemicals and Materials  
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Content Code RH 117/217

TRU METAL WASTE

|                  |  |                            |
|------------------|--|----------------------------|
| GROUP 22:        | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Nickel<br>Zirconium  | T<br>M                     |
| GROUP 23:        | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum alloys<br>Cadmium<br>Carbon steel<br>Iron<br>Lead<br>Zirconium | D<br>T<br>D<br>T<br>T<br>M |
| GROUP 24:        | METALS AND METAL COMPOUNDS, TOXIC<br>Cadmium<br>Chromium<br>Lead<br>Nickel<br>Zirconium  | T<br>D<br>T<br>D<br>M      |
| OTHER INORGANICS | Cryolite<br>Magnesium oxide<br>Silica<br>Stainless steel   | M<br>T<br>T<br>D           |
| OTHER ORGANICS   | Amercoat   | T                          |

Refer to Introduction for a description of the designations used in this chemical list.

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Richland Hanford  
List of Chemicals and Materials  
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Content Code RH 122/222

SOLID INORGANIC WASTE

|                  |  |                                     |
|------------------|--|-------------------------------------|
| GROUP 10:        | CAUSTICS<br>Calcium Oxide (Oxidized calcium)   | D                                   |
| GROUP 21:        | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL<br>Barium   | T                                   |
| GROUP 22:        | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Nickel   | T1                                  |
| GROUP 23:        | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Cadmium<br>Calcium<br>Chromium<br>Lead<br>Tin                                     | T2<br>T<br>T<br>T1<br>T             |
| GROUP 24:        | METALS AND METAL COMPOUNDS, TOXIC<br>Barium<br>Beryllium<br>Cadmium<br>Chromium<br>Lead<br>Nickel<br>Silver  | T<br>T1<br>T2<br>T<br>T1<br>T1<br>T |
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Celotex (Packaging material)<br>Polyethylene (Packaging material)<br>Polyvinyl chloride (Packaging material) | D<br>M<br>M                         |
| GROUP 107:       | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Calcium oxide (Oxidized calcium)                          | T<br>D                              |
| OTHER INORGANICS | Crucibles<br>Plutonium<br>Plutonium oxide<br>Sand<br>Sand (Slag and crucible heel)<br>Slag<br>Uranium oxide  | D<br>T<br>D<br>D<br>D<br>D<br>D     |

Refer to Introduction for a description of the designations used in this chemical list.

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Richland Hanford  
List of Chemicals and Materials  
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Content Code RH 123/223

TRU LEADED RUBBER

|  |   |                  |
|--|---|------------------|
| GROUP 2:                                 | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid                  | T1               |
| GROUP 23:                                | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Lead (Encapsuled)                          | D                |
| GROUP 24:                                | METALS AND METAL COMPOUNDS, TOXIC<br>Lead   | D                |
| GROUP 32:                                | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate  | T2               |
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cloth<br>Polyethylene<br>Polyvinyl chloride<br>Rubber gloves (Leaded) | D<br>M<br>M<br>D |
| OTHER INORGANICS                         | Asbestos<br>Leaded glass  | D<br>M           |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | Diatomaceous Earth  | D                |

Refer to Introduction for a description of the designations used in this chemical list.

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Richland Hanford  
List of Chemicals and Materials  
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Content Code RH 125/225

TRU MIXED PAPER, METAL, AND GLASS

|           |  |                            |
|-----------|--|----------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Phosphoric acid  | T<br>T                     |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Sulfamic acid<br>Sulfuric acid (<70%)  | T<br>T<br>T1               |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Benzyl butyl ester phthalic acid<br>Formic acid<br>Methyl ester methacrylic acid<br>Oxalic acid                         | T<br>T1<br>T<br>T<br>T     |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>2-Butoxyethanol<br>Butyl alcohol<br>Ethanol<br>Isopropyl alcohol   | T<br>T<br>T<br>T           |
| GROUP 7:  | AMINES, ALIPHATIC AND AROMATIC<br>Ethanolamine<br>Triheptylamine   | T<br>T                     |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonia (Ammonium hydroxide)<br>Calcium hydroxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide<br>Trioctylphosphinic oxide | T<br>D<br>M<br>T<br>M<br>T |
| GROUP 11: | CYANIDES<br>Cuprous cyanide<br>Cyanide<br>Potassium cyanide<br>Sodium cyanide  | T<br>T<br>T<br>T           |
| GROUP 13: | ESTERS<br>Bis(2-Ethylhexyl) phthalate<br>Di-n-octyl phthalate  | T<br>T                     |

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List of Chemicals and Materials  
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TRU MIXED PAPER, METAL, AND GLASS

|           |  |   |
|-----------|--|---|
| GROUP 15: | FLUORIDES<br>Calcium fluoride<br>Potassium fluoride<br>Sodium fluoride   | D<br>T1<br>T  |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Benzene<br>Bis(2-Ethylhexyl) phthalate<br>Di-n-octyl phthalate<br>1,2,4-Trimethylbenzene<br>Xylene   | T<br>T<br>T<br>T<br>T   |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1-Dichloroethylene<br>1,2-Dichloroethane<br>1,1,1-Trichloroethane<br>Carbon tetrachloride<br>Chloroform<br>Chloroethylene<br>Dichloromethane<br>Heptachlor<br>Hexachlorobutadiene<br>Hexachloroethane<br>Polychlorinated biphenyls<br>Tetrachloroethylene<br>Trichloroethene | T1<br>T1<br>T<br>T<br>T<br>T1<br>T<br>T<br>T1<br>T1<br>T1*<br>T1<br>T |
| GROUP 19: | KETONES<br>4-Methyl-2-pentanone<br>Acetone<br>Methyl ethyl ketone<br>Trenoyltrifluoroacetone   | T<br>T<br>T<br>T  |
| GROUP 21: | METALS, ALKALI, AND ALKALINE EARTH, ELEMENTAL<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Batteries<br>Lithium<br>Sodium  | T<br>M<br>M<br>T  |

\*Polychlorinated biphenyl concentration is less than 50 ppm

Richland Hanford  
List of Chemicals and Materials  
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TRU MIXED PAPER, METAL, AND GLASS

|           |  |  |
|-----------|--|--|
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Aluminum<br>Nickel<br>Selenium<br>Zirconium  | M<br>T<br>T<br>T   |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Aluminum Alloys<br>Cadmium<br>Carbon Steel<br>Chromium<br>Copper<br>Iron<br>Lead (Encapsuled)<br>Selenium<br>Silver<br>Stainless Steel<br>Zirconium  | M<br>D<br>M<br>D<br>M<br>M<br>D<br>D<br>T<br>T<br>D<br>T                                     |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Barium<br>Beryllium<br>Cadmium<br>Chromic oxide<br>Chromium<br>Copper<br>Copper sulfate<br>Cuprous cyanide<br>Lead<br>Lead chromate<br>Mercury<br>Molybdic acid<br>Nickel<br>Selenium<br>Silver<br>Silver oxide<br>Vanadium pentoxide<br>Zirconium | T1<br>T<br>T<br>M<br>T<br>M<br>M<br>T<br>T<br>D<br>M<br>M<br>T<br>T<br>T<br>T<br>T<br>T<br>T |
| GROUP 28: | HYDROCARBONS, ALIPHATIC, UNSATURATED (ALL ISOMERS)<br>Polypropylene  | M  |
| GROUP 29: | HYDROCARBONS, ALIPHATIC, SATURATED<br>Cyclohexane  | T  |

Richland Hanford  
List of Chemicals and Materials  
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TRU MIXED PAPER, METAL, AND GLASS

|            |  |  |
|------------|--|--|
| GROUP 31:  | PHENOLS, CREOSOLS<br>Creosol   | T  |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES, PHOSPHODITHIOATES<br>Di-butyl phosphate<br>Monobutyl phosphite<br>Tributyl phosphate  | M<br>M<br>D  |
| GROUP 34:  | EPOXIDES<br>1-Butoxyl-2,3-Epoxy-Propane  | T  |
| GROUP 101: | COMBUSTIBLES AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Asphalt<br>Bakelite<br>Cork<br>Kerosene<br>Leather<br>Naphtha<br>Oil products<br>Paper products<br>Plastic<br>Plexiglas/Lucite<br>Polyamides (Nylon)<br>Polyethylene<br>Polypropylene<br>Polyurethane<br>Polyvinyl chloride<br>Rags and Cloth<br>Rope<br>Rubber products<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Tape<br>Teflon<br>Waxes and Greases<br>Wood | D<br>M<br>M<br>T<br>M<br>M<br>D<br>D<br>D<br>D<br>M<br>D<br>M<br>M<br>M<br>D<br>M<br>D<br>D<br>D<br>M<br>M<br>D<br>D |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Sodium nitrate   | T  |
| GROUP 105: | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Sodium  | T  |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Water (Absorbed)  | M  |

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TRU MIXED PAPER, METAL, AND GLASS

|  |   |
|--|---|
| <p>GROUP 107: WATER REACTIVE SUBSTANCES<br/>(Constituents reacted prior to loading in payload containers.)<br/>Barium<br/>Lithium<br/>Sodium<br/>Sulfuric acid (&gt;70%)</p>   | <p>T<br/>M<br/>T<br/>T1</p>   |
| <p>OTHER INORGANICS<br/>Aluminum oxide<br/>Ammonium chloride<br/>Asbestos<br/>Calcium chlorofluorophosphate<br/>Clays<br/>Cryolite<br/>Dipotassium dichromate<br/>Ferrous ammonium sulfate<br/>HEPA Filters<br/>Glass<br/>Leaded glass<br/>Paint<br/>Salts<br/>Sand<br/>Silver chloride<br/>Sodium bisulfate<br/>Sodium chloride<br/>Sodium sulfate<br/>Soil</p> | <p>T<br/>T1<br/>D<br/>T<br/>D<br/>M<br/>T1<br/>T1<br/>D<br/>D<br/>M<br/>D<br/>D<br/>M<br/>T1<br/>T1<br/>T<br/>D</p> |
| <p>OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br/>Concrete<br/>Diatomaceous Earth<br/>Kitty Litter<br/>Perlite<br/>Portland Cement<br/>Vermiculite</p>   | <p>D<br/>D<br/>D<br/>D<br/>D<br/>D</p>  |

Refer to Introduction for a description of the designations used in this chemical list.

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Richland Hanford  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code RH 130/230

SOLID INORGANIC WITH RESIDUAL ORGANIC WASTE

|            |   |                            |
|------------|---|----------------------------|
| GROUP 4:   | ALCOHOLS AND GLYCOLS<br>Butanol<br>Methanol   | T2<br>T2                   |
| GROUP 10:  | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Sodium hydroxide  | T                          |
| GROUP 15:  | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium fluoride<br>Sodium fluoride                         | T1<br>T1                   |
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Xylene  | T2                         |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-Trifluoroethane<br>Carbon tetrachloride<br>Methylene chloride                  | T1<br>T1<br>T2<br>T2       |
| GROUP 22:  | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF<br>POWDERS, VAPORS, OR SPONGES<br>Nickel<br>Zirconium   | T<br>T                     |
| GROUP 23:  | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Aluminum<br>Aluminum alloys<br>Iron<br>Low carbon steel<br>Zirconium | M<br>D<br>T<br>M<br>T      |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Lead<br>Nickel<br>Zirconium  | T1<br>T<br>T               |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Paper<br>Plastic (*Specify if known)<br>Rags and cloth<br>Synthetic rubber<br>Wood | M<br>M<br>M<br>M<br>M<br>M |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Water  | T                          |

Richland Hanford  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code RH 130/230  
(Continued)

SOLID INORGANIC WITH RESIDUAL ORGANIC WASTE

|  |   |
|--|---|
| OTHER INORGANICS                         |   |
| Asbestos                                 | T |
| Ash                                      | D |
| Ash heel                                 | D |
| Carbon alloys                            | M |
| Cryolite                                 | M |
| Fiberglass filter media                  | D |
| Oxides                                   | D |
| Silica                                   | T |
| Soot                                     | D |
| Soot heel                                | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Glass                                    | D |
| Oil-Dri                                  | M |

Refer to Introduction for a description of the designations used in this chemical list.

Sandia National Laboratories/California  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code SL 111/211

ADSORBED/SOLIDIFIED TRITIUM CONTAMINATED LIQUID WASTE

|           |  |   |
|-----------|--|---|
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Stainless Steel | M |
|           | OTHER SOLIDIFICATION MATERIAL/ABSORBENTS<br>Superfine or Florco Clay                             | D |

Refer to Introduction for a description of the designations used in this chemical list.

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Small Quantity Site  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code SQ 111/211

SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLID WASTE

|           |   |                         |
|-----------|---|-------------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers)  | T                       |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers)  | T                       |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers)   | T                       |
| GROUP 4:  | ALCOHOLS AND GLYCOLS  | T                       |
| GROUP 8:  | AZO COMPOUNDS, DIAZO COMPOUNDS, AND HYDRAZINES  | T                       |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers)<br>Ammonium hydroxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide<br>Sodium hypochlorite | T1<br>D<br>T<br>D<br>T1 |
| GROUP 11: | CYANIDES  | T2                      |
| GROUP 13: | ESTERS  | T2                      |
| GROUP 14: | ETHERS  | T                       |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers)   | T                       |
| GROUP 16: | HYDROCARBONS, AROMATIC  | T                       |
| GROUP 17: | HALOGENATED ORGANICS  | T                       |
| GROUP 18: | ISOCYANATES   | T2                      |
| GROUP 19: | KETONES   | T                       |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers)<br>Magnesium<br>Sodium                                       | T2<br>T2                |

Small Quantity Site  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code SQ 111/211  
(Continued)

SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLID WASTE

|           |   |    |
|-----------|---|----|
| GROUP 22: | METALS OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES |    |
|           | Aluminum  | T1 |
|           | Cobalt  | T2 |
|           | Magnesium   | T2 |
|           | Manganese   | T2 |
|           | Mercury (Vapor)   | T1 |
|           | Nickel  | T2 |
|           | Thorium   | M  |
|           | Titanium  | D  |
|           | Uranium   | T  |
|           | Zirconium   | T1 |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.  |    |
|           | Aluminum  | T1 |
|           | Cadmium   | T2 |
|           | Chromium  | T2 |
|           | Cobalt  | T2 |
|           | Copper  | T1 |
|           | Iron  | T  |
|           | Lead  | T1 |
|           | Manganese   | T  |
|           | Metal cans  | D  |
|           | Reduced metal alloys  | D  |
|           | Selenium  | T2 |
|           | Silver  | T2 |
|           | Stainless Steel   | D  |
|           | Thorium   | M  |
|           | Tin   | T1 |
|           | Titanium  | T2 |
|           | Uranium   | T  |
|           | Zirconium   | D  |

Small Quantity Site  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code SQ 111/211  
(Continued)

SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLID WASTE

|            |   |  |
|------------|---|--|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Beryllium<br>Cadmium<br>Chromium<br>Cobalt<br>Copper<br>Lead<br>Manganese<br>Mercury<br>Nickel<br>Silver nitrate<br>Selenium<br>Silver<br>Strontium<br>Thorium<br>Titanium<br>Uranium<br>Zirconium | T<br>D<br>T2<br>T2<br>T1<br>D<br>T<br>T<br>D<br>T2<br>T2<br>T2<br>T2<br>M<br>T2<br>T<br>T1 |
| GROUP 25:  | NITRIDES  | T2   |
| GROUP 28:  | HYDROCARBON, ALIPHATIC, UNSATURATED   | T  |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED   | T  |
| GROUP 30:  | PEROXIDES AND HYDROPEROXIDES, ORGANIC<br>(Constituents reacted prior to loading in payload containers)  | T  |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES  | T  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Carbon  | M  |
| GROUP 103: | POLYMERIZABLE COMPOUNDS<br>(Constituents reacted prior to loading in payload containers)  | T  |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers)<br>Hydrogen peroxide<br>Silver nitrate<br>Sodium hypochlorite<br>Sodium nitrate   | T2<br>T2<br>T1<br>D  |
| GROUP 105: | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers)<br>Phosphorous<br>Sodium   | T<br>T2  |

Small Quantity Site  
List of Chemicals and Materials  
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Content Code SQ 111/211  
(Continued)

SOLIDIFIED AQUEOUS OR HOMOGENEOUS INORGANIC SOLID WASTE

|  |  |  |
|--|--|--|
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | M<br>T   |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers)<br>Aluminum chloride<br>Phosphorous<br>Sodium   | D<br>T<br>T2   |
| OTHER INORGANICS                         | Ash<br>Calcium chloride<br>Ferric hydroxide<br>Nitrate salts<br>Refractory<br>Sand<br>Silicon<br>Slag<br>Soil<br>Zeolite   | D<br>M<br>M<br>D<br>D<br>M<br>T1<br>D<br>D<br>D          |
| OTHER ORGANICS                           |  | T  |
| OTHER SOLIDIFICATION MATERIALS/ABSORBENT | Aquaset/Petroset<br>Cement<br>Diatomaceous Earth<br>Envirostone<br>Florco<br>Oil-Dri<br>Portland Cement<br>Radsorb<br>Sludge<br>Superfine or Florco Clay<br>Surfactants<br>Vermiculite | D<br>D<br>D<br>D<br>M<br>D<br>D<br>M<br>D<br>D<br>T<br>D |

Refer to Introduction for a description of the designations used in this chemical list.



Small Quantity Site  
List of Chemicals and Materials  
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Content Code SQ 112/212

SOLIDIFIED ORGANIC WASTE

|            |   |                                 |
|------------|---|---------------------------------|
| GROUP 3:   | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers)   | D                               |
| GROUP 4:   | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isopropanol<br>Methanol   | D<br>D<br>D<br>D                |
| GROUP 13:  | ESTERS<br>Ethyl acetate   | M                               |
| GROUP 16:  | HYDROCARBONS, AROMATIC<br>Ethyl benzene<br>Toluene<br>Trimethylbenzene<br>Xylene  | M<br>M<br>D<br>M                |
| GROUP 17:  | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform<br>Methylene chloride<br>Trichloroethylene   | D<br>D<br>D<br>D<br>D<br>D      |
| GROUP 19:  | KETONES<br>Acetone<br>Methyl ethyl ketone<br>Methyl isobutyl ketone   | D<br>M<br>M                     |
| GROUP 22:  | METALS, OTHER ELEMENTAL AND ALLOYS, IN THE FORM OF<br>POWDERS, VAPORS OR SPONGES  | T                               |
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC   | T                               |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED<br>N-Paraffin hydrocarbons (NPH)<br>Oil (Absorbed)  | D<br>D                          |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate  | D                               |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Grease<br>Hydraulic oil<br>Mineral oil<br>Oil (Absorbed)<br>Polyethylene (Packaging material)<br>Polyethylene glycol<br>Polyvinyl chloride (Packaging material) | M<br>D<br>D<br>D<br>D<br>D<br>D |

Small Quantity Site  
List of Chemicals and Materials  
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Content Code SQ 112/212  
(Continued)

SOLIDIFIED ORGANIC WASTE

|  |   |
|--|---|
| GROUP 106: WATER AND MIXTURES CONTAINING WATER | T |
| OTHER INORGANICS                               |   |
| Calcium silicate                               | D |
| Potassium sulfate                              | D |
| OTHER SOLIDIFICATION MATERIALS/ABSORBENT       |   |
| Concrete                                       | D |
| Diatomaceous Earth                             | D |
| Envirostone                                    | D |
| Magnesia Cement (Hydrated)                     | D |
| Portland Cement                                | D |
| Sludge   | D |

Refer to Introduction for a description of the designations used in this chemical list.

Small Quantity Site  
List of Chemicals and Materials  
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Content Code SQ 114/214

CEMENTED INORGANIC PROCESS SOLIDS

|  |   |                                 |
|--|---|---------------------------------|
| GROUP 4:                                 | ALCOHOLS AND GLYCOLS  | T                               |
| GROUP 15:                                | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers)             | T                               |
| GROUP 16:                                | HYDROCARBONS, AROMATIC  | T                               |
| GROUP 17:                                | HALOGENATED ORGANICS  | T                               |
| GROUP 23:                                | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Low Carbon Steel | D                               |
| GROUP 24:                                | METALS AND METAL COMPOUNDS, TOXIC   | T                               |
| GROUP 106:                               | WATER AND MIXTURES CONTAINING WATER   | T                               |
| OTHER INORGANICS                         | Clay (Bentonite)<br>Firebrick<br>Grit<br>Sand<br>Slag<br>Sodium chloride<br>Soot                  | D<br>D<br>D<br>D<br>D<br>D<br>D |
| OTHER SOLIDIFICATION MATERIALS/ABSORBENT | Concrete (Cemented sludges)<br>Portland Cement (Hydrated)   | D<br>D                          |

Refer to Introduction for a description of the designations used in this chemical list.

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Small Quantity Site  
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Content Code SQ 120/220

TRU ISOTOPIC SOURCE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Sodium oxide   | T   |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Magnesium<br>Potassium<br>Sodium                                     | T<br>T<br>T<br>T                                    |
| GROUP 22: | METALS OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Aluminum<br>Cobalt<br>Bismuth<br>Beryllium<br>Magnesium<br>Manganese<br>Molybdenum<br>Nickel<br>Titanium<br>Zinc<br>Zirconium | D<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>D<br>T<br>D |

Small Quantity Site  
List of Chemicals and Materials  
in TRU Waste Content Codes

Content Code SQ 120/220  
(Continued)

TRU ISOTOPIC SOURCE WASTE

|           |   |  |
|-----------|---|--|
| GROUP 23: | <p>METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS,<br/>MOLDINGS, DROPS, ETC.<br/>Americium (Foil, wire)<br/>Aluminum<br/>Bismuth<br/>Boron<br/>Cadmium<br/>Chromium<br/>Cobalt<br/>Copper<br/>Hastelloy-C<br/>Iron<br/>Manganese<br/>Molybdenum<br/>Lead<br/>Platinum<br/>Silicon<br/>Stainless Steel<br/>Steel<br/>Tungsten<br/>Tungsten (Alloy)<br/>Titanium<br/>Tin<br/>Tantalum<br/>Zirconium<br/>Zinc</p> | <p>D<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>D<br/>D<br/>D<br/>D<br/>D<br/>D<br/>D<br/>D<br/>D<br/>T</p> |
| GROUP 24: | <p>METALS AND METAL COMPOUNDS, TOXIC<br/>Beryllium<br/>Bismuth<br/>Cadmium<br/>Calcium<br/>Chromium<br/>Cobalt<br/>Copper<br/>Lead<br/>Manganese<br/>Molybdenum<br/>Nickel<br/>Titanium<br/>Zinc<br/>Zirconium</p>  | <p>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>D<br/>T<br/>D</p>   |

Small Quantity Site  
List of Chemicals and Materials  
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Content Code SQ 120/220  
(Continued)

TRU ISOTOPIC SOURCE WASTE

|  |   |   |
|--|---|---|
| GROUP 101:                               | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS  |   |
|  | Grease  | T |
|  | Nitrile rubber gloves   | T |
|  | Paper   | T |
|  | Polyethelene  | T |
|  | Polypropylene   | T |
|  | Polyvinyl chloride  | T |
|  | Synthetic rubber  | T |
|  | Wood  | T |
| GROUP 102:                               | EXPLOSIVES  |   |
|  | Calcium   | T |
| GROUP 105:                               | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)   |   |
|  | Calcium   | T |
|  | Sodium  | T |
| GROUP 107:                               | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.) |   |
|  | Calcium   | T |
|  | Potassium   | T |
|  | Sodium oxide  | T |
|  | Sodium  | T |
| OTHER INORGANICS                         |   |   |
|  | Americium oxide   | D |
|  | Beryllium windows   | T |
|  | Ceramic   | D |
|  | Cesium in glass   | D |
|  | Filter media (Inorganic)  | D |
|  | Magnesium oxide   | D |
|  | Glass, labware  | D |
|  | Plutonium oxide   | D |
|  | Sand  | D |
|  | Soil  | D |
|  | Silicon oxide   | D |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |   |
|  | Vermiculite   | D |

Refer to Introduction for a description of the designations used in this chemical list.

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Small Quantity Site  
List of Chemicals and Materials  
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Content Code SQ 121/221

SOLID ORGANIC WASTE

|           |  |   |
|-----------|--|---|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers)                           | T |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers)                               | T |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers)  | T |
| GROUP 4:  | ALCOHOLS AND GLYCOLS   | T |
| GROUP 8:  | AZO COMPOUNDS, DIAZO COMPOUNDS, AND HYDRAZINES<br>(Constituents reacted prior to loading in payload containers)          | T |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload container)   | T |
| GROUP 11: | CYANIDES   | T |
| GROUP 13: | ESTERS   | T |
| GROUP 14: | ETHERS   | T |
| GROUP 15: | FLUORIDES  | T |
| GROUP 16: | HYDROCARBONS, AROMATIC   | T |
| GROUP 17: | HALOGENATED ORGANICS   | T |
| GROUP 18: | ISOCYANATES  | T |
| GROUP 19: | KETONES  | T |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers) | T |
| GROUP 22: | METALS OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES  | T |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.   | D |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC  | D |
| GROUP 25: | NITRIDES   | T |
| GROUP 28: | HYDROCARBON, ALIPHATIC, UNSATURATED  | T |
| GROUP 29: | HYDROCARBON, ALIPHATIC, SATURATED  | T |
| GROUP 30: | PEROXIDES AND HYDROPEROXIDES, ORGANIC<br>(Constituents reacted prior to loading in payload containers)                   | T |

Content Code SQ 121/221  
(Continued)

|                  |   |  |
|------------------|---|--|
| GROUP 32:        | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND PHOSPHODITHIOATES<br>Tributyl Phosphate   | D  |
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Asphalt<br>Benelex<br>Cardboard<br>Cellulose<br>Cloth<br>Fiberglass<br>Grease<br>Hydraulic oil<br>Ion exchange resin<br>Mineral oil<br>Molds and Crucibles<br>Oil<br>Paper<br>Plastic<br>Plexiglas<br>Polybutadiene<br>Polyethylene<br>Polymethyl methacrylate<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride<br>Rags and Cloth<br>Rubber<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Wood | D<br>D<br>D<br>D<br>D<br>M<br>D<br>T<br>D<br>T<br>D<br>D<br>D<br>D<br>T<br>D<br>D<br>D<br>D<br>M<br>T<br>D<br>D<br>D<br>D<br>T<br>M<br>D |
| GROUP 103:       | POLYMERIZABLE COMPOUNDS<br>(Constituents reacted prior to loading in payload containers)  | T  |
| GROUP 104:       | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers)   | T  |
| GROUP 105:       | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers)  | T  |
| GROUP 106:       | WATER AND MIXTURES CONTAINING WATER   | T  |
| GROUP 107:       | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers)  | D  |
| OTHER INORGANICS |   | D  |

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SOLID ORGANIC WASTE

|  |   |
|--|---|
| OTHER ORGANICS                           | T |
| OTHER SOLIDIFICATION MATERIALS/ABSORBENT |   |
| Diatomaceous Earth                       | M |
| Florco                                   | M |
| Hydrated Aquaset II                      | D |
| Radsorb                                  | M |

Refer to Introduction for a description of the designations used in this chemical list.

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Content Code SQ 122/222

TRU INORGANIC SOLID WASTE

|           |  |                  |
|-----------|--|------------------|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers)<br>Hydrofluoric acid                | T1               |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers)<br>Chromic acid                         | T1               |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers)<br>EDTA  | T                |
| GROUP 4:  | ALCOHOLS AND GLYCOLS   | T                |
| GROUP 8:  | AZO COMPOUNDS, DIAZO COMPOUNDS, AND HYDRAZINES<br>(Constituents reacted prior to loading in payload containers)                    | T                |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers)<br>Calcium oxide   | D                |
| GROUP 11: | CYANIDES   | T1               |
| GROUP 13: | ESTERS   | T1               |
| GROUP 14: | ETHERS   | T                |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers)<br>Calcium fluoride<br>Hydrofluoric acid     | D<br>T1          |
| GROUP 16: | HYDROCARBONS, AROMATIC   | T                |
| GROUP 17: | HALOGENATED ORGANICS   | T                |
| GROUP 18: | ISOCYANATES  | T1               |
| GROUP 19: | KETONES  | T                |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers)<br>Barium | T                |
| GROUP 22: | METALS OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS OR SPONGES<br>Aluminum<br>Selenium<br>Thorium<br>Zirconium        | D<br>T<br>T<br>T |

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TRU INORGANIC SOLID WASTE

|           |  |  |
|-----------|--|--|
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Chromium<br>Copper<br>Graphite (Molds and Crucibles)<br>Iron<br>Iron tin (Alloy)<br>Lead<br>Low carbon steel<br>Metal cans<br>Metal cans (For salt)<br>Platinum<br>Selenium<br>Silver<br>Stainless steel<br>Tantalum<br>Thorium<br>Tungsten<br>Uranium<br>Zinc magnesium (Alloy)<br>Zirconium | D<br>D<br>T<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>T<br>T<br>D<br>D<br>T<br>D<br>T<br>D<br>T |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Barium<br>Barium sulfate<br>Beryllium<br>Cadmium<br>Chromic acid<br>Chromium<br>Copper<br>Lead<br>Mercury<br>Potassium permanganate<br>Selenium<br>Silver<br>Silver nitrate<br>Thorium<br>Zirconium   | T<br>D<br>T<br>D<br>T1<br>T<br>D<br>D<br>M<br>T<br>T<br>T<br>T1<br>T<br>T                                  |
| GROUP 25: | NITRIDES   | T1   |
| GROUP 28: | HYDROCARBON, ALIPHATIC, UNSATURATED<br>Polypropylene   | T  |
| GROUP 29: | HYDROCARBON, ALIPHATIC, SATURATED  | T  |

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TRU INORGANIC SOLID WASTE

|            |  |   |
|------------|--|---|
| GROUP 30:  | PEROXIDES AND HYDROPEROXIDES, ORGANIC<br>(Constituents reacted prior to loading in payload containers)   | T   |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES   | T   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Acrylic paint<br>Bakelite<br>Benelex<br>Carbon (Spent, Activated)<br>Grease<br>Mineral oil<br>Naphtha<br>Oil<br>Paper<br>Plexiglas<br>Polyethylene (Packaging material)<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride (Packaging material)<br>PVC solvent cement<br>Resins<br>Rubber gloves<br>Synthetic rubber<br>Waxes<br>Wood | T<br>T<br>T<br>D<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>M<br>T<br>T<br>T<br>M<br>T<br>T<br>T<br>T<br>T |
| GROUP 103: | POLYMERIZABLE COMPOUNDS<br>(Constituents reacted prior to loading in payload containers)   | T   |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers)<br>Aluminum nitrate<br>Aluminum nitrate nanohydrate<br>Bromine<br>Chromic acid<br>Hydrogen peroxide<br>Potassium permanganate<br>Silver nitrate<br>Sodium nitrate<br>Sodium nitrite  | T<br>T<br>T<br>T1<br>T<br>T<br>T1<br>T<br>T   |

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|                  |  |  |
|------------------|--|--|
| GROUP 105:       | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers)<br>Ferrous sulfamate<br>Hydroxyl amine<br>Hydroxyl amine nitrate<br>Sodium borohydride  | T<br>T<br>T<br>T   |
| GROUP 106:       | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T<br>T   |
| GROUP 107:       | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers)<br>Aluminum chloride<br>Barium<br>Calcium oxide   | T<br>T<br>D  |
| OTHER INORGANICS | Ash<br>Alumina/Silica blanket<br>Borated water (Crystallized)<br>Calcium chloride<br>Cesium chloride<br>Clay (Bentonite)<br>Fiberglass<br>Firebrick<br>Glass, labware<br>Glass, raschig rings<br>Grit<br>Insulation<br>Magnesium chloride<br>Ceramic (Molds and Crucibles)<br>Potassium chloride<br>Salt (Fused chloride)<br>Sand<br>Slag<br>Sodium chloride<br>Soil<br>Soot | T<br>T<br>T<br>D<br>D<br>D<br>D<br>M<br>D<br>D<br>T<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>T |
| OTHER ORGANICS   | Bh-38, complexing agent<br>Fluorinert<br>Foaming Insurance, complexing agent<br>MAGNAFLUX, complexing agent  | T<br>T<br>T<br>T   |



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## TRU INORGANIC SOLID WASTE

| OTHER SOLIDIFICATION MATERIALS/ABSORBENT |   |
|--|---|
| Celite                                   | D |
| Concrete                                 | D |
| Diatomaceous Earth                       | M |
| Oil-Dri                                  | D |
| Portland Cement (Hydrated)               | T |
| Radsorb                                  | M |
| Soda ash                                 | D |
| Vermiculite                              | D |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLID ORGANIC AND INORGANIC WASTE

|           |  |                              |
|-----------|--|------------------------------|
| GROUP 1:  | ACIDS MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid  | T2<br>T<br>T                 |
| GROUP 2:  | ACIDS MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid<br>Sulfuric acid  | T2<br>T2<br>T                |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Oxalic acid  | T2                           |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isopropanol<br>Methanol  | T2<br>T1<br>T<br>T2          |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>MX-12 (Caustic cleaner)<br>Oakite (Caustic cleaner)<br>Potassium hydroxide (Big K)<br>Sodium hydroxide<br>Turco Products (Alkaline cleaner) | T1<br>T<br>T<br>T<br>T2<br>T |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Calcium fluoride<br>Hydrofluoric acid   | T<br>T1<br>T                 |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Ethyl benzene<br>Toluene<br>Xylene   | T2<br>T2<br>T2               |

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SOLID ORGANIC AND INORGANIC WASTE

|           |  |   |
|-----------|--|---|
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2 Trichloro-1,2,2-trifluoroethane<br>Bromoform<br>Carbon tetrachloride<br>Dichloroethane<br>Freon TF<br>Methylene chloride<br>Trichloroethylene   | T<br>T1<br>T2<br>T1<br>T2<br>T<br>T1<br>T                                       |
| GROUP 19: | KETONES<br>Acetone   | T   |
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium   | T   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Nickel<br>Selenium  | T2<br>T1  |
| GROUP 23: | METALS, OTHER ELEMENTAL, AND ALLOY, AS SHEETS, RODS, MOLDINGS, DROPS ETC.<br>Aluminum<br>Brass<br>Cadmium<br>Carbon Steel<br>Chromium<br>Copper<br>Graphite (Molds and Crucibles)<br>Iron<br>Iron/Tin (Alloy)<br>Lead<br>Metal cans<br>Selenium<br>Stainless Steel<br>Tantalum<br>Titanium<br>Tungsten | D<br>D<br>T1<br>D<br>T2<br>D<br>T<br>D<br>M<br>D<br>D<br>T1<br>D<br>D<br>D<br>D |

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SOLID ORGANIC AND INORGANIC WASTE

|            |  |   |
|------------|--|---|
| GROUP 24:  | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Cadmium<br>Calcium<br>Chromium<br>Lead<br>Mercury<br>Nickel<br>Plutonium oxide (Pieces)<br>Selenium<br>Silver<br>Uranium oxide (Pieces)   | T1<br>T1<br>T1<br>T<br>T2<br>T1<br>T1<br>T2<br>D<br>T1<br>T1<br>D                                       |
| GROUP 27:  | NITRO COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrocellulose<br>Urea nitrate  | T2<br>T2  |
| GROUP 29:  | HYDROCARBON, ALIPHATIC, SATURATED<br>Oils  | D   |
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tributyl phosphate<br>Trioctyl phosphine oxide   | M<br>T  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Celotex (Packaging material)<br>Cloth<br>Filters<br>Cutting oil<br>Hydraulic oil<br>Ion exchange resin<br>Mineral oil<br>Oil<br>Paint (Chips, ALARA Paint)<br>Paper<br>Polyethylene (Packaging material)<br>Polypropylene (Ful-Flo Filters)<br>Polyvinyl chloride (Packaging material)<br>Resins<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Spray lubricants<br>Wood | M<br>D<br>D<br>D<br>T<br>T<br>D<br>T<br>T<br>D<br>D<br>D<br>T<br>D<br>D<br>D<br>D<br>T1<br>D<br>T<br>T2 |

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SOLID ORGANIC AND INORGANIC WASTE

|            |  |              |
|------------|--|--------------|
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium nitrate<br>Calcium<br>Nitrocellulose          | T<br>T<br>T2 |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide<br>Other nitrate salts | T2<br>T      |
| GROUP 105: | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Hydroxyl amine                 | T<br>T2      |
| GROUP 106: | WATER AND MIXTURES CONTIANING WATER<br>Aqueous solutions and mixtures<br>Water   | T1<br>T      |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Calcium oxide                | T<br>T1      |

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SOLID ORGANIC AND INORGANIC WASTE

|  |    |
|--|----|
| OTHER INORGANICS                             |    |
| Alconox                                      | T  |
| Aluminum nitrate                             | T  |
| Ash  | M  |
| Ceramic (Molds and Crucibles)                | T  |
| Cement                                       | T  |
| Concreted                                    | T  |
| Concrete particulate                         | D  |
| Defoaming agents                             | T  |
| Ferrous sulfamate                            | T  |
| Firebrick                                    | D  |
| Fogproof                                     | T  |
| Glass  | D  |
| Grit   | D  |
| HEPA Filters                                 | T  |
| Insulation                                   | T2 |
| Metal-X                                      | T  |
| Other filters                                | T1 |
| Radiac wash                                  | T  |
| Salt (Calcium fluoride and calcium chloride) | T1 |
| Sand   | D  |
| Slag   | D  |
| Soot   | D  |
| Zep Spray                                    | T  |
| OTHER ORGANICS                               |    |
| Big Orange Cleaner                           | T  |
| DOWANOL                                      | T  |
| Windex                                       | T  |
| OTHER SOLIDIFICATION MATERIALS/ABSORBENTS    |    |
| Absorbent polymers                           | T  |
| Aquaset/Petroset                             | D  |
| Cement (Portland and Magnesia)               | D  |
| Diatomaceous Earth                           | T  |
| Envirostone                                  | D  |
| Fly ash                                      | T  |
| Oxalate salts                                | T  |
| Surfactants                                  | T1 |
| Vermiculite                                  | T  |

Refer to Introduction for a description of the designations used in this chemical list.

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SOLIDIFIED ORGANIC PROCESS SOLIDS

|           |  |   |
|-----------|--|---|
| GROUP 1:  | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted to loading in payload containers.)<br>Hydrochloric acid<br>Hydrofluoric acid<br>Phosphoric acid   | T2<br>T<br>T2                             |
| GROUP 2:  | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Nitric acid<br>Perchloric acid<br>Sulfuric acid (<70%)  | T2<br>T2<br>T2                            |
| GROUP 3:  | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Oxalic acid  | T2  |
| GROUP 4:  | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Isopropanol<br>Methanol  | T2<br>T1<br>T<br>T2                       |
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium oxide<br>Potassium hydroxide<br>Sodium hydroxide   | T1<br>T2<br>T2                            |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium fluoride<br>Calcium fluoride<br>Hydrofluoric acid   | T<br>T1<br>T                              |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Ethyl benzene<br>Toluene<br>Xylene   | T2<br>T2<br>T2                            |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,1-Trichloroethane<br>1,1,2 Trichloro-1,2,2-trifluoroethane<br>Bromoform<br>Carbon tetrachloride<br>Dichloroethane<br>Freon TF<br>Methylene chloride<br>Trichloroethylene | T<br>T1<br>T2<br>T1<br>T2<br>T<br>T1<br>T |

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SOLIDIFIED ORGANIC PROCESS SOLIDS

|           |   |   |
|-----------|---|---|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium  | T   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Nickel<br>Selenium   | T2<br>T1  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Chromium<br>Graphite (Molds and Crucibles)<br>Iron<br>Iron/Tin (Alloy)<br>Lead<br>Metal cans<br>Selenium<br>Stainless Steel<br>Steel<br>Tantalum | M<br>T1<br>T2<br>T<br>T1<br>M<br>T2<br>D<br>T1<br>T1<br>M<br>T2 |
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC<br>Arsenic<br>Beryllium<br>Cadmium<br>Calcium<br>Chromium<br>Lead<br>Mercury<br>Nickel<br>Selenium<br>Silver  | T1<br>T1<br>T1<br>T<br>T2<br>T1<br>T1<br>T2<br>T1<br>T1         |
| GROUP 27: | NITRO COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Nitrocellulose<br>Urea nitrate   | T2<br>T2  |
| GROUP 29: | HYDROCARBON, ALIPHATIC, SATURATED<br>Oils   | D   |
| GROUP 32: | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND PHOSPHODITHIOATES<br>Tributyl phosphate<br>Trioctyl phosphine oxide   | M<br>T  |

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SOLIDIFIED ORGANIC PROCESS SOLIDS

|            |  |   |
|------------|--|---|
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Cellulose<br>Celotex (Packaging material)<br>Ion exchange resin<br>Oil<br>Paint (Chips, ALARA Paint)<br>Polyethylene<br>Polypropylene (Ful-Flo Filters)<br>Polyvinyl chloride<br>Resins<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Wood | M<br>D<br>D<br>M<br>M<br>D<br>T<br>D<br>D<br>D<br>T1<br>D<br>T2 |
| GROUP 102: | EXPLOSIVES<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium nitrate<br>Calcium<br>Nitrocellulose<br>Urea nitrate  | T<br>T<br>T2<br>T2  |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrogen peroxide<br>Other nitrate salts<br>Sodium nitrate<br>Urea nitrate   | T2<br>T<br>M<br>T2  |
| GROUP 105: | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Hydroxyl amine   | T<br>T2   |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T1<br>T   |
| GROUP 107: | WATER REACTIVE SUBSTANCES<br>(Constituents reacted to loading in payload containers.)<br>Calcium<br>Calcium oxide<br>Sulfuric acid   | T<br>T1<br>T  |

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SOLIDIFIED ORGANIC PROCESS SOLIDS

|  |    |
|--|----|
| OTHER INORGANICS                             |    |
| Aluminum nitrate                             | T  |
| Ash  | M  |
| Ceramic (Molds and Crucibles)                | T  |
| Ferrous sulfamate                            | T  |
| Firebrick                                    | D  |
| Glass, labware                               | T  |
| Grit   | D  |
| HEPA Filters                                 | T  |
| Insulation                                   | T2 |
| Other filters                                | T1 |
| Salt (Calcium fluoride and calcium chloride) | T1 |
| Sand   | D  |
| Slag   | D  |
| Soot   | D  |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS     |    |
| Absorbent polymers                           | T  |
| Aquaset/Petroset                             | D  |
| Cement (Portland and Magnesia)               | D  |
| Envirostone                                  | D  |
| Flocculating agents                          | T  |
| Oil-Dri                                      | D  |
| Oxalate salts                                | T  |
| Surfactants                                  | T1 |
| Vermiculite                                  | D  |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU METAL PIPE WASTE

|                  |   |             |
|------------------|---|-------------|
| GROUP 15:        | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Aluminum fluoride<br>Sodium fluoride  | M<br>M      |
| GROUP 23:        | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS,<br>MOLDINGS, DROPS, ETC.<br>Stainless Steel  | D           |
| GROUP 101:       | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Polyethylene (Contamination protection overwrap)<br>Polyvinyl chloride (Contamination protection overwrap)<br>Synthetic rubber (O-Ring) | T<br>T<br>T |
| OTHER INORGANICS | Alumina (Al <sub>2</sub> O <sub>3</sub> )   | D           |

Refer to Introduction for a description of the designations used in this chemical list.

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Content Code SR 122/222

TRU NONCOMBUSTIBLE WASTE

|          |  |  |
|----------|--|--|
| GROUP 1: | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Boric acid<br>Chlorosulfonic acid (Reacted)<br>Fluoroboric acid<br>Fluorosilicic acid<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid<br>Hydroiodic acid<br>Phosphoric acid | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T |
| GROUP 2: | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Chromic acid<br>Nitric acid<br>Sulfonic acid<br>Sulfuric acid (<70%)  | T<br>T<br>T<br>T                               |
| GROUP 3: | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Ascorbic acid<br>EDTA<br>Formic acid  | T1<br>T<br>T<br>T                              |
| GROUP 4: | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Glycerin<br>Isopropanol<br>Methanol  | T<br>T<br>T<br>T<br>T                          |
| GROUP 8: | AZO COMPOUNDS, DIAZO COMPOUNDS, AND HYDRAZINES<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrazine<br>Hydrazine mononitrate   | T<br>T   |

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TRU COMBUSTIBLE WASTE

|           |  |  |
|-----------|--|--|
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Barium hydroxide<br>Barium oxide<br>Beryllium hydroxide<br>Calcium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide<br>Sodium hypochlorite                                      | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T      |
| GROUP 14: | ETHERS<br>Ethyl ether  | T  |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Aluminum fluoride<br>Ammonium bifluoride<br>Ammonium fluoride<br>Barium fluoride<br>Calcium fluoride<br>Fluoroboric acid<br>Fluorosilicic acid<br>Hydrofluoric acid<br>Magnesium fluoride<br>Potassium fluoride<br>Sodium fluoride | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Toluene<br>Xylene  | T<br>T   |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform  | T<br>T<br>T  |
| GROUP 19: | KETONES<br>Acetone<br>Methyl isobutyl ketone<br>Thenoyl trifluoroacetone (TTA)   | T<br>T<br>T  |



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TRU COMBUSTIBLE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Calcium<br>Magnesium<br>Potassium<br>Sodium   | <br>T<br>T<br>T<br>T<br>T   |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Magnesium<br>Mercury (Vapor)<br>Nickel<br>Thorium<br>Titanium<br>Uranium<br>Zirconium   | <br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Chromium<br>Copper<br>Gold<br>Graphite<br>Iron<br>Lead<br>Molds and Crucibles, graphite<br>Platinum<br>Silver<br>Stainless Steel<br>Tantalum<br>Thorium<br>Titanium<br>Tungsten<br>Uranium<br>Zinc<br>Zirconium | <br>D<br>D<br>T<br>M<br>T<br>M<br>D<br>D<br>M<br>M<br>T<br>D<br>T<br>T<br>T<br>M<br>T<br>T<br>T |

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TRU COMBUSTIBLE WASTE

|           |                                   |    |
|-----------|-----------------------------------|----|
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC | T  |
|           | Acrylead                          | T  |
|           | Barium                            | T  |
|           | Barium chloride                   | T  |
|           | Barium fluoride                   | T  |
|           | Barium hydroxide                  | T  |
|           | Barium nitrate                    | T  |
|           | Barium oxide                      | T  |
|           | Barium sulfate                    | M  |
|           | Beryllium                         | T  |
|           | Beryllium hydroxide               | T  |
|           | Boron carbide                     | T1 |
|           | Cadmium                           | D  |
|           | Calcium                           | T  |
|           | Chromic acid                      | T  |
|           | Chromium                          | T  |
|           | Copper                            | M  |
|           | Lead                              | D  |
|           | Lead nitrate                      | T  |
|           | Lead oxide                        | T  |
|           | Magnesium oxide                   | T  |
|           | Mercuric nitrate                  | T  |
|           | Mercury                           | T  |
|           | Nickel                            | T  |
|           | Nickel nitrate                    | T  |
|           | Potassium dichromate              | T  |
|           | Silver nitrate                    | T  |
|           | Sodium chromate                   | T  |
|           | Sodium dichromate                 | T  |
|           | Sodium tetraborate                | T  |
|           | Strontium nitrate                 | T  |
|           | Thorium                           | T  |
|           | Titanium                          | T  |
|           | Uranium sulfide                   | T  |
|           | Uranyl nitrate                    | T  |
|           | Zinc                              | T  |
|           | Zinc nitrate                      | T  |
|           | Zirconium                         | T  |
| GROUP 29: | HYDROCARBON, ALIPHATIC, SATURATED | T  |
|           | Cyclohexane                       | T  |
|           | Decane                            | T  |
|           | Hexane                            | T  |
|           | Nonane                            | T  |
|           | Pentane                           | T  |
|           | Petroleum ether                   | T  |

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TRU COMBUSTIBLE WASTE

|            |  |  |
|------------|--|--|
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tri-n-octyl phosphine oxide (TOPO)<br>Tributyl phosphate   | T<br>T   |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Acrylic paint<br>Carbon (Spent, Activated)<br>Grease<br>Kerosene<br>Methyl acetone<br>Naphtha<br>PVC solvent cement  | T<br>D<br>T<br>T<br>T<br>T<br>T  |
| GROUP 102: | EXPLOSIVES<br>Calcium  | T  |
| GROUP 103: | POLYMERIZABLE COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Epoxy<br>Water-extended polyester   | T<br>T   |
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Aluminum nitrate<br>Aluminum nitrate nanohydrate<br>Barium nitrate<br>Bromine<br>Chromic acid<br>Hydrogen peroxide<br>Hydroxyl amine nitrate<br>Lead nitrate<br>Mercuric nitrate<br>Nickel nitrate<br>Potassium dichromate<br>Potassium permanganate<br>Sodium dichromate<br>Sodium hypochlorite<br>Sodium nitrate<br>Sodium nitrite<br>Sodium peroxide<br>Strontium nitrate<br>Uranyl nitrate<br>Zinc nitrate | T1<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T |

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|                  |  |  |
|------------------|--|--|
| GROUP 105:       | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Ferrous sulfamate<br>Hydrazine<br>Hydroxyl amine<br>Sodium<br>Sodium borohydride<br>Uranium sulfide  | T<br>T<br>T<br>T<br>T<br>T<br>T                          |
| GROUP 106:       | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T<br>T   |
| GROUP 107:       | WATER REACTIVE SUBSTANCES<br>(Constituents reacted prior to loading in payload containers.)<br>Aluminum chloride<br>Aluminum flouride<br>Barium<br>Barium oxide<br>Calcium<br>Calcium oxide<br>Hydrobromic acid<br>Potassium<br>Sodium<br>Sodium peroxide<br>Sulfuric acid | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T |
| OTHER INORGANICS | Alumina/Silica blanket<br>Borated water (Crystallized)<br>Glass, labware<br>Glass, raschig rings<br>Insulation<br>Ceramic (Molds and Crucibles)<br>Sand<br>Slag<br>Soil  | T<br>T<br>D<br>M<br>M<br>D<br>M<br>T<br>M                |
| OTHER ORGANICS   | BH-38, complexing agent<br>Fluorinert<br>Foaming Insurance, complexing agent<br>MAGNAFLUX, complexing agent  | T<br>T<br>T1<br>T1                                       |

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TRU COMBUSTIBLE WASTE

|  |   |
|--|---|
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS |   |
| Celite                                   | M |
| Concrete                                 | M |
| Oil-Dri                                  | D |
| Soda ash                                 | M |
| Vermiculite                              | D |

Refer to Introduction for a description of the designations used in this chemical list.

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TRU COMBUSTIBLE WASTE

|          |  |  |
|----------|--|--|
| GROUP 1: | ACIDS, MINERAL, NON-OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Boric acid<br>Chlorosulfonic acid (Reacted)<br>Fluoroboric acid<br>Fluorosilicic acid<br>Hydrobromic acid<br>Hydrochloric acid<br>Hydrofluoric acid<br>Hydroiodic acid<br>Phosphoric acid | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T |
| GROUP 2: | ACIDS, MINERAL, OXIDIZING<br>(Constituents reacted prior to loading in payload containers.)<br>Chromic acid<br>Nitric acid<br>Sulfonic acid<br>Sulfuric acid (<70%)  | T<br>T<br>T<br>T                               |
| GROUP 3: | ACIDS, ORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Acetic acid<br>Ascorbic acid<br>EDTA<br>Formic acid<br>Oxalic acid   | T1<br>T<br>T<br>T<br>T                         |
| GROUP 4: | ALCOHOLS AND GLYCOLS<br>Butanol<br>Ethanol<br>Glycerin<br>Isopropanol<br>Methanol  | T<br>T<br>T<br>T<br>T                          |
| GROUP 8: | AZO COMPOUNDS, DIAZO COMPOUNDS, AND HYDRAZINES<br>(Constituents reacted prior to loading in payload containers.)<br>Hydrazine<br>Hydrazine mononitrate   | T<br>T   |

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TRU COMBUSTIBLE WASTE

|           |  |  |
|-----------|--|--|
| GROUP 10: | CAUSTICS<br>(Constituents reacted prior to loading in payload containers.)<br>Ammonium hydroxide<br>Barium hydroxide<br>Barium oxide<br>Beryllium hydroxide<br>Calcium hydroxide<br>Calcium oxide<br>Potassium hydroxide<br>Sodium carbonate<br>Sodium hydroxide<br>Sodium hypochlorite                                      | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T      |
| GROUP 14: | ETHERS<br>Ethyl ether  | T  |
| GROUP 15: | FLUORIDES, INORGANIC<br>(Constituents reacted prior to loading in payload containers.)<br>Aluminum fluoride<br>Ammonium bifluoride<br>Ammonium fluoride<br>Barium fluoride<br>Calcium fluoride<br>Fluoroboric acid<br>Fluorosilicic acid<br>Hydrofluoric acid<br>Magnesium fluoride<br>Potassium fluoride<br>Sodium fluoride | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T |
| GROUP 16: | HYDROCARBONS, AROMATIC<br>Toluene<br>Xylene  | T<br>T   |
| GROUP 17: | HALOGENATED ORGANICS<br>1,1,2-Trichloro-1,2,2-trifluoroethane<br>Carbon tetrachloride<br>Chloroform  | T<br>T<br>T  |
| GROUP 19: | KETONES<br>Acetone<br>Methyl isobutyl ketone<br>Thenoyl trifluoroacetone (TTA)   | T<br>T<br>T  |



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TRU COMBUSTIBLE WASTE

|           |  |   |
|-----------|--|---|
| GROUP 21: | METALS, ALKALI AND ALKALINE EARTH, ELEMENTAL AND ALLOYS<br>(Constituents reacted prior to loading in payload containers.)<br>Barium<br>Batteries<br>Calcium<br>Magnesium<br>Potassium<br>Sodium  | T<br>T<br>T<br>T<br>T<br>T  |
| GROUP 22: | METALS, OTHER ELEMENTAL AND ALLOYS IN THE FORM OF POWDERS, VAPORS, OR SPONGES<br>Aluminum<br>Magnesium<br>Mercury (Vapor)<br>Nickel<br>Thorium<br>Titanium<br>Uranium<br>Zirconium   | T<br>T<br>T<br>T<br>T<br>T<br>T<br>T  |
| GROUP 23: | METALS, OTHER ELEMENTAL AND ALLOYS, AS SHEETS, RODS, MOLDINGS, DROPS, ETC.<br>Aluminum<br>Cadmium<br>Chromium<br>Copper<br>Gold<br>Graphite<br>Iron<br>Lead<br>Molds and Crucibles, graphite<br>Platinum<br>Silver<br>Stainless Steel<br>Tantalum<br>Thorium<br>Titanium<br>Tungsten<br>Uranium<br>Zinc<br>Zirconium | D<br>D<br>T<br>M<br>T<br>M<br>D<br>D<br>M<br>M<br>T<br>D<br>T<br>T<br>T<br>M<br>T<br>T<br>T |

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TRU COMBUSTIBLE WASTE

|           |                                   |    |
|-----------|-----------------------------------|----|
| GROUP 24: | METALS AND METAL COMPOUNDS, TOXIC | T  |
|           | Acrylead                          | T  |
|           | Barium                            | T  |
|           | Barium chloride                   | T  |
|           | Barium fluoride                   | T  |
|           | Barium hydroxide                  | T  |
|           | Barium nitrate                    | T  |
|           | Barium oxide                      | T  |
|           | Barium sulfate                    | M  |
|           | Beryllium                         | T  |
|           | Beryllium hydroxide               | T  |
|           | Boron carbide                     | T1 |
|           | Cadmium                           | D  |
|           | Calcium                           | T  |
|           | Chromic acid                      | T  |
|           | Chromium                          | T  |
|           | Copper                            | M  |
|           | Lead                              | D  |
|           | Lead nitrate                      | T  |
|           | Lead oxide                        | T  |
|           | Magnesium oxide                   | T  |
|           | Mercuric nitrate                  | T  |
|           | Mercury                           | T  |
|           | Nickel                            | T  |
|           | Nickel nitrate                    | T  |
|           | Potassium dichromate              | T  |
|           | Silver nitrate                    | T  |
|           | Sodium chromate                   | T  |
|           | Sodium dichromate                 | T  |
|           | Sodium tetraborate                | T  |
|           | Strontium nitrate                 | T  |
|           | Thorium                           | T  |
|           | Titanium                          | T  |
|           | Uranium sulfide                   | T  |
|           | Uranyl nitrate                    | T  |
|           | Zinc                              | T  |
|           | Zinc nitrate                      | T  |
|           | Zirconium                         | T  |
| GROUP 29: | HYDROCARBON, ALIPHATIC, SATURATED | T  |
|           | Cyclohexane                       | T  |
|           | Decane                            | T  |
|           | Hexane                            | T  |
|           | Nonane                            | T  |
|           | Pentane                           | T  |
|           | Petroleum ether                   | T  |

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TRU COMBUSTIBLE WASTE

|            |  |   |
|------------|--|---|
| GROUP 32:  | ORGANOPHOSPHATES, PHOSPHOTHIOATES AND<br>PHOSPHODITHIOATES<br>Tri-n-octyl phosphine oxide (TOPO)<br>Tributyl phosphate   | T<br>M  |
| GROUP 101: | COMBUSTIBLE AND FLAMMABLE MATERIALS, MISCELLANEOUS<br>Acrylic paint<br>ALARA Paint<br>Asphalt<br>Bakelite<br>Benelex<br>Carbon (Spent, Activated)<br>Cellulose<br>Grease<br>Ion exchange resin<br>Kerosene<br>Methyl acetone<br>Naphtha<br>Oil<br>Paper<br>Plexiglas<br>Polyethylene<br>Polypropylene<br>Polystyrene<br>Polyurethane<br>Polyvinyl chloride<br>PVC solvent cement<br>Rubber gloves<br>Rubber gloves (Leaded)<br>Synthetic rubber<br>Teflon<br>Waxes<br>Wood | T<br>M<br>M<br>D<br>D<br>D<br>D<br>T<br>D<br>T<br>T<br>T<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>D<br>T<br>D<br>D<br>D<br>D<br>M<br>M<br>D |
| GROUP 102: | EXPLOSIVES<br>Calcium  | T   |
| GROUP 103: | POLYMERIZABLE COMPOUNDS<br>(Constituents reacted prior to loading in payload containers.)<br>Epoxy<br>Water-extended polyester   | T<br>T  |

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TRU COMBUSTIBLE WASTE

|            |  |  |
|------------|--|--|
| GROUP 104: | OXIDIZING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Aluminum nitrate<br>Aluminum nitrate nanohydrate<br>Barium nitrate<br>Bromine<br>Chromic acid<br>Hydrogen peroxide<br>Hydroxyl amine nitrate<br>Lead nitrate<br>Mercuric nitrate<br>Nickel nitrate<br>Potassium dichromate<br>Potassium permanganate<br>Sodium dichromate<br>Sodium hypochlorite<br>Sodium nitrate<br>Sodium nitrite<br>Sodium peroxide<br>Strontium nitrate<br>Uranyl nitrate<br>Zinc nitrate | T1<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T<br>T |
| GROUP 105: | REDUCING AGENTS, STRONG<br>(Constituents reacted prior to loading in payload containers.)<br>Calcium<br>Ferrous sulfamate<br>Hydrazine<br>Hydroxyl amine<br>Sodium<br>Sodium borohydride<br>Uranium sulfide  | T<br>T<br>T<br>T<br>T<br>T<br>T  |
| GROUP 106: | WATER AND MIXTURES CONTAINING WATER<br>Aqueous solutions and mixtures<br>Water   | T<br>T   |

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TRU COMBUSTIBLE WASTE

|  |  |  |
|--|--|--|
| GROUP 107:                               | <p>WATER REACTIVE SUBSTANCES<br/>(Constituents reacted prior to loading in payload containers.)</p> <p>Aluminum chloride<br/>Aluminum flouride<br/>Barium<br/>Barium oxide<br/>Calcium<br/>Calcium oxide<br/>Hydrobromic acid<br/>Potassium<br/>Sodium<br/>Sodium peroxide<br/>Sulfuric acid</p> | <p>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T<br/>T</p>       |
| OTHER INORGANICS                         | <p>Alumina/Silica blanket<br/>Borated water (Crystallized)<br/>Firebrick<br/>Glass, labware<br/>Glass, raschig rings<br/>HEPA Filters (Or filter media)<br/>Insulation<br/>Molds and Crucibles, ceramic<br/>Other filters<br/>Sand<br/>Slag<br/>Soil</p>   | <p>T<br/>T<br/>D<br/>D<br/>M<br/>D<br/>M<br/>D<br/>D<br/>M<br/>T<br/>M</p> |
| OTHER ORGANICS                           | <p>BH-38, complexing agent<br/>Fluorinert<br/>Foaming Insurance, complexing agent<br/>Lexan<br/>MAGNAFLUX, complexing agent<br/>Turco 4320, complexing agent</p>   | <p>T<br/>T<br/>T1<br/>M<br/>T1<br/>T</p>                                   |
| OTHER SOLIDIFICATION MATERIAL/ABSORBENTS | <p>Acrylic acrylate resin<br/>Celite<br/>Concrete<br/>Oil-Dri<br/>Soda ash<br/>Surfactants (Nonphosphated anionic detergent)<br/>Vermiculite</p>   | <p>D<br/>M<br/>M<br/>D<br/>M<br/>D<br/>D</p>                               |

Refer to Introduction for a description of the designations used in this chemical list.

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