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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

November 1, 2012

Jose Franco, Manager
Carlsbad Field Office
Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

Farok Sharif, Project Manager
Nuclear Waste Partnership LLC
P.O. Box 2078
Carlsbad, New Mexico 88221-5608

RE: FINAL DETERMINATION, CLASS 2 MODIFICATION REQUEST
WIPP HAZARDOUS WASTE FACILITY PERMIT
EPA I.D. NUMBER NM4890139088

Dear Messrs. Franco and Sharif:

The New Mexico Environment Department (**NMED**) hereby approves with changes the permit modification request (**PMR**) to the WIPP Hazardous Waste Facility Permit as submitted to the Hazardous Waste Bureau in the following document:

- Request for Class 2 Permit Modification (TRUPACT-III, SLB2, CH Bay), Letter Dated 7/5/2012, Rec'd 7/6/12

The following items were included in this submittal:

- Add the shielded container as a shipping package
- Add a description of how the volume of RH TRU mixed waste which is disposed in shielded containers will be tracked
- Related changes to waste handling descriptions

This Class 2 PMR was evaluated and processed in accordance with the requirements specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.42(b)). It was subject to a 60-day public comment period running from July 12, 2012 through September 10, 2012.

NMED hereby approves this modification with changes as noted in Attachment 1. Attachment 2 contains redline/strikeout pages of the modified permit to help the reader rapidly identify each modification. Language deleted from the permit is ~~stricken out~~. Language added to the permit is highlighted in redline. Specific language changes imposed by NMED are distinguished from language changes proposed in the modification request by yellow highlighting. Also enclosed is a CD-ROM containing the modified files in MS Word redline/strikeout format as well as files with markings and comments removed. An electronic version of the modified permit with markings removed will be publicly posted on the NMED WIPP Information Page at <http://www.nmenv.state.nm.us/wipp/download.html>.

For purposes of version control, please note that NMED has established the date of these modified module and attachment pages as November 1, 2012. The effective date of the permit modification approval is your date of receipt of this letter.

NMED is providing response to all public comments under separate cover.

If you have any questions regarding this matter, please contact Trais Kliphuis of my staff at (505) 476-6051.

Sincerely,

James H. Davis, Ph.D.
Director
Resource Protection Division

Attachment 1 – CD with Microsoft Word copies of both redline strikeout version and changes incorporated version

cc: John Kieling, NMED HWB
Trais Kliphuis, NMED HWB
Thomas Kesterson, NMED DOE-OB/WIPP
Laurie King, EPA Region 6
Tom Peake, EPA ORIA

File: Red WIPP '12

3.3.1.3. Ten-drum Overpack (**TDOP**)

Each TDOP has a gross internal volume of 160 ft^3 (4.5 m^3). TDOPs may be used to contain up to ten standard 55-gallon drums or one SWB. TDOPs may be direct loaded or used to overpack drums or SWBs containing CH TRU mixed waste.

3.3.1.4. 85-gallon (322-liter) Drum

Each 85-gallon drum has a gross internal volume of up to 11.4 ft^3 (0.32 m^3). 85-gallon drums may be direct loaded or used for overpacking 55-gallons drums containing CH TRU mixed waste and for collecting and storing derived waste.

3.3.1.5. 100-gallon (379-liter) Drum

Each 100-gallon drum has a gross internal volume of 13.4 ft^3 (0.38m^3). 100-gallon drums may be direct loaded with CH TRU mixed waste.

3.3.1.6. RH TRU Canister

Each RH TRU canister has a gross internal volume of 31.4 ft^3 (0.89 m^3). RH TRU canisters contain RH TRU mixed waste packaged in small containers (e.g., 55-gallon drums) or waste loaded directly into the canister.

3.3.1.7. Standard Large Box 2 (**SLB2**)

Each SLB2 has a gross internal volume of 261 ft^3 (7.39 m^3). SLB2s may be direct loaded with CH TRU mixed waste.

3.3.1.8. Shielded Container*

Each shielded container contains a 30-gallon inner container with a gross internal volume of 4.0 ft^3 (0.11m^3). Shielded containers contain RH TRU mixed waste, but shielding will allow it to be managed and stored as CH TRU mixed waste. For the purpose of this Permit, shielded containers will be managed, stored, and disposed as CH TRU mixed waste. Shielded containers may be overpacked into standard waste box or ten drum overpack.

* "Shielded Container" refers to the container depicted in Figure A1-37.

3.3.2. Derived Waste Containers

The Permittees shall use standard 55-gallon drums, SWBs, or 85-gallon drums to collect, store, and dispose of derived waste.

ii. Notwithstanding Permit Section 4.1.1.2.i, any Underground HWDU CH TRU waste capacity may be increased by up to 25 percent of the total maximum capacity in Table 4.1.1 by submitting a Class 2 permit modification request in accordance with 20.4.1.900 NMAC (incorporating 40 CFR §270.42(b)).

Table 4.1.1 - Underground HWDUs

Description[1]	Waste Type	Maximum Capacity[2]	~~Container Equivalent~~	Final Waste Volume
Panel 1	CH TRU	636,000ft^3 (18,000 m^3)		370,800 ft^3 (10,500 m^3)
Panel 2	CH TRU	636,000 ft^3 (18,000 m^3)		635,600 ft^3 (17,998 m^3)
Panel 3	CH TRU	662,150 ft^3 (18,750 m^3)		603,600 ft^3 (17,092 m^3)
Panel 4	CH TRU	662,150 ft^3 (18,750 m^3)		503,500 ft^3 (14,258 m^3)
	RH TRU	12,570 ft^3 (356 m^3)	~~400 RH TRU Canisters~~	6,200 ft^3 (176 m^3)
Panel 5	CH TRU	662,150 ft^3 (18,750 m^3)		562,500 ft^3 (15,927m^3)
	RH TRU	15,720 ft^3 (445 m^3)	~~500 RH TRU Canisters~~	8,300 ft^3 (235 m^3)
Panel 6	CH TRU	662,150 ft^3 (18,750 m^3)		
	RH TRU	18,860 ft^3 (534 m^3)	~~600 RH TRU Canisters~~	
Panel 7	CH TRU	662,150 ft^3 (18,750 m^3)		
	RH TRU	22,950 ft^3 (650 m^3)	~~730 RH TRU Canisters~~	
Panel 8	CH TRU	662,150 ft^3 (18,750 m^3)		
	RH TRU	22,950 ft^3 (650 m^3)	~~730 RH TRU Canisters~~	
Total	**CH TRU**	**5,244,900 ft^3 (148,500 m^3)**		
	RH TRU	**93,050 ft^3 (2,635 m^3)**	~~**2960 RH TRU Canisters**~~	

[1] The area of each panel is approximately 124,150 ft2 (11,533 m2).
[2] "Maximum Capacity" is the maximum volume of TRU mixed waste that may be emplaced in each panel. The maximum repository

4.3. DISPOSAL CONTAINERS

4.3.1. Acceptable Disposal Containers

The Permittees shall use containers that comply with the requirements for U.S. Department of Transportation shipping container regulations (49 CFR §173 - Shippers - General Requirements for Shipment and Packaging, and 49 CFR §178 - Specifications for Packaging) for disposal of TRU mixed waste at WIPP. The Permittees are prohibited from disposing TRU mixed waste in any container not specified in Permit Attachment A1 (Container Storage), Section A1-1b, as set forth below:

4.3.1.1. Standard 55-gallon (208-liter) Drum

Standard 55-gallon drums are configured as a 7-pack or as an individual unit.

4.3.1.2. Standard Waste Box (**SWB**)

An SWB is configured as an individual unit.

4.3.1.3. Ten-drum Overpack (**TDOP**)

A TDOP is configured as an individual unit.

4.3.1.4. 85-gallon (322-liter) Drum

85-gallon drums are configured as a 4-pack or as an individual unit.

4.3.1.5. 100 gallon (379-liter) Drum

100-gallon drums are configured as a 3-pack or as an individual unit.

4.3.1.6. RH TRU Canister

An RH TRU canister is configured as an individual unit.

4.3.1.7. Standard Large Box 2 (**SLB2**)

An SLB2 is configured as an individual unit.

4.3.1.8. Shielded Container

Shielded containers are configured as a three-pack.

(as described in Section A1-1d(1)) will be installed in the 85-gal drum to prevent the escape of any radioactive particulates and to eliminate any potential of pressurization.

85-gal (322-L) drums are constructed of mild steel and may also contain rigid, molded polyethylene (or other compatible material) liners. These liners are procured to a specification describing the functional requirements of fitting inside the drum, material thickness and tolerances, and quality controls and required testing. A quality assurance surveillance program is applied to all procurements to verify that the liners meet the specification.

The 85-gal (322-L) drum, which is shown in Figure A1-6, will be used for overpacking contaminated 55-gal (208 L) drums at the WIPP facility. The 85-gal drum may also be direct loaded with CH TRU mixed waste.

85-gal (322-L) drums may be used to collect derived waste.

100-Gallon Drum

100-gal (379-L) drums meet the requirements for DOT specification 7A regulations.

A 100-gal (379-L) drum has a gross internal volume of 13.4 ft^3 (0.38 m^3). One or more filtered vents (as described in Section A1-1d(1) will be installed in the drum lid or body to prevent the escape of any radioactive particulates and to eliminate any potential of pressurization.

100-gal (379-L) drums are constructed of mild steel and may also contain rigid, molded polyethylene (or other compatible material) liners. These liners are procured to a specification describing the functional requirements of fitting inside the drum, material thickness and tolerances, and quality controls and required testing. A quality assurance surveillance program is applied to all procurements to verify that the liners meet the specification.

100-gal (379-L) drums may be direct loaded.

Standard Large Box 2

The SLB2 meets the requirements of DOT specification 7A requirements. The SLB2 is a welded steel container with a gross internal volume of 261 ft^3 (7.39 m^3).

One or more filtered vents will be installed in the SLB2 body and located near the top of the SLB2 to prevent the escape of radioactive particulates and to prevent internal pressurization. Figure A1-34 shows an SLB2.

A1-1b(2) RH TRU Mixed Waste Containers

Remote-Handled (**RH**) TRU mixed waste containers include RH TRU Canisters, which are received at WIPP loaded singly in an RH-TRU 72-B cask, shielded containers, which are received in HalfPACTs, and 55-gallon drums, which are received in a CNS 10-160B cask.

RH TRU Canister

The RH TRU Canister is a steel single shell container which is constructed to be of high integrity. An example canister is depicted in Figure A1-16a. The RH TRU Canister is vented and

will have a nominal internal volume of 31.4 ft^3 (0.89 m^3) and shall contain waste packaged in small containers (e.g., drums) or waste loaded directly into the canister.

Standard 55-Gallon Drums

Standard 55-gal (208-L) drums meet the requirements for U.S. Department of Transportation (DOT) specification 7A regulations. A detailed description of a standard 55-gallon drum is provided above. Up to ten 55-gallon drums containing RH TRU mixed waste are arranged on two drum carriage units in the CNS 10-160B cask (up to five drums per drum carriage unit). The drums are transferred to an RH TRU mixed waste Facility Canister that will contain three drums.

Shielded Container

Remote-Handled TRU mixed waste received at the WIPP facility in shielded containers will be arranged as three-packs. A summary description of the shielded container is provided below. The shielded container meets the requirements for DOT specification 7A (Figure A1-37).

Shielded containers consist of a 30-gallon inner container with a gross internal volume of 4.0 ft^3 (0.11 m^3). One or more filter vents will be installed in the shielded container lid to prevent the escape of radioactive particulates and to prevent internal pressurization. The shielded container is constructed with approximately one inch of lead shielding on the sides and approximately three inches of steel on the top and bottom of the container and will be used to emplace RH TRU mixed waste. The shielding will allow it to be managed and stored as CH TRU mixed waste.

A1-1b(3) Container Compatibility

All containers will be made of steel, and some will contain rigid, molded polyethylene liners. The compatibility study, documented in Appendix C1 of the WIPP RCRA Part B Permit Application (DOE, 1997a), included container materials to assure containers are compatible with the waste. Therefore, these containers meet the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.172).

A1-1c Description of the Container Storage Units

A1-1c(1) Waste Handling Building Container Storage Unit (WHB Unit)

The Waste Handling Building (**WHB**) is the surface facility where TRU mixed waste handling activities will take place (Figure A1-1a). The WHB has a total area of approximately 84,000 square feet (ft^2) (7,804 square meters (m^2)) of which 32,307 ft^2 (3,001 m^2) are designated for the waste handling and container storage of CH TRU mixed waste and 17,403 ft^2 (1,617 m^2) are designated for handling and storage of RH TRU mixed waste, as shown in Figures A1-1, A1-14a, and A1-17a, b, c, and d. These areas are being permitted as the WHB Unit. The concrete floors are sealed with a coating that is sufficiently impervious to the chemicals in TRU mixed waste to meet the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.175(b)(1)).

For inventory control purposes, TRU mixed waste container identification numbers will be verified against the Uniform Hazardous Waste Manifest and the WWIS. Inconsistencies will be resolved with the generator before TRU mixed waste is emplaced. Discrepancies that are not resolved within 15 days will be reported to the NMED in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.72).

Each facility pallet has two recessed pockets to accommodate two sets of 7-packs (see Figure A1-10), two sets of 4-packs, two sets of 3-packs, or two SWBs stacked two-high, two TDOPs, or any combination thereof. Each facility pallet will accommodate one SLB2. Each stack of waste containers will be secured prior to transport underground. A forklift or the facility transfer vehicle will transport the loaded facility pallet to the conveyance loading room located adjacent to the Waste Shaft. The conveyance loading room serves as an air lock between the CH Bay and the Waste Shaft, preventing excessive air flow between the two areas. The facility transfer vehicle will be driven onto the waste shaft conveyance deck, where the loaded facility pallet will be transferred to the waste shaft conveyance, and the facility transfer vehicle will be backed off. Containers of CH TRU mixed waste (55-gal (208 L) drums, SWBs, 85-gal (322 L) drums, 100-gal (379-L) drums, and TDOPs) can be handled individually, if needed, using the forklift and lifting attachments (i.e., drum handlers, parrot beaks).

The waste shaft conveyance will lower the loaded facility pallet to the Underground HWDUs. Figure A1-13 is a flow diagram of the CH TRU mixed waste handling process.

A1-1d(3) RH TRU Mixed Waste Handling

The RH TRU mixed waste that is not in a shielded container will be received in the RH-TRU 72-B cask or CNS 10-160B cask loaded on a trailer, as illustrated in process flow diagrams in Figures A1-26 and A1-27, respectively. These are shown schematically in Figures A1-28 and A1-29. Remote-Handled TRU mixed waste received in shielded containers will be managed and stored as CH TRU mixed waste. Upon arrival at the gate, external radiological surveys, security checks, shipping documentation reviews are performed and the Uniform Hazardous Waste Manifest is signed. The generator's copy of the Uniform Hazardous Waste Manifest is returned to the generator. Should the results of the contamination survey exceed acceptable levels, the shipping cask and transport trailer remain outside the WHB in the Parking Area Unit, and the appropriate radiological boundaries (i.e., ropes, placards) are erected around the shipping cask and transport trailer. A determination will be made whether to return the cask to the originating site or to decontaminate the cask.

Following cask inspections, the shipping cask and trailer are moved into the RH Bay or held in the Parking Area Unit. The waste handling process begins in the RH Bay where the impact limiter(s) are removed from the shipping cask while it is on the trailer. Additional radiological surveys are conducted on the end of the cask previously protected by the impact limiter(s) to verify the absence of contamination. The cask is unloaded from the trailer using the RH Bay Overhead Bridge Crane and placed on a Cask Transfer Car.

Differential air pressure between the RH TRU mixed waste handling locations in the RH Complex protects workers and prevents potential spread of contamination during handling of RH TRU mixed waste. Airflow between key rooms in the WHB is controlled by maintaining differential pressures between the rooms. The CH Receiving Bay is maintained with a negative pressure relative to outside atmosphere. The RH Receiving Bay is maintained with a requirement to be positive pressure relative to the CH Receiving Bay. The RH Hot Cell is

Transfer of Disposal Canister into the Facility Cask

The transfer of a canister into the Facility Cask from the Transfer Cell is monitored by closed-circuit television cameras. The Transfer Cell Shuttle Car positions the RH-TRU 72-B cask or Shielded Insert under the Facility Cask Loading Room port and the shield valve is opened. Then the remotely operated 6.25 Ton Grapple Hoist attaches to the canister, and the canister is lifted through the open shield valve into the vertically-oriented Facility Cask located on the Cask Transfer Car in the Facility Cask Loading Room. During this cask-to-cask transfer, the telescoping port shield is in contact with the underside of the Facility Cask to assure shielding continuity, as does the shield bell located above the Facility Cask.

For canisters received at the WIPP from the generator site in a RH-TRU 72-B cask, the identification number is verified using cameras, which also provide images of the canister surfaces during the lifting operation. Identification numbers are verified against the WWIS. If there are any discrepancies, the canister is returned to the RH-TRU 72-B cask, returned to the Parking Area Unit, and the generator is contacted for resolution. Discrepancies that are not resolved within 15 days will be reported to the NMED as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.72). As the canister is being lifted from the RH-TRU 72-B cask into the Facility Cask, additional swipe samples may be taken.

Transfer of the Canister to the Underground

When the canister is fully within the Facility Cask, the lower shield valve is closed. The 6.25 Ton Grapple Hoist detaches from the canister and is raised until the 6.25 Ton Grapple Hoist clears the Facility Cask, at which time the upper shield valve is closed. The 6.25 Ton Grapple Hoist and shield bell are then raised clear of the Facility Cask, and the telescoping port shield is retracted. The Facility Cask Rotating Device rotates the Facility Cask until it is in the horizontal position on the Facility Cask Transfer Car. The shield doors on the Facility Cask Loading Room are opened, and the facility Cask Transfer Car moves onto the waste shaft conveyance and is lowered to the waste Shaft Station underground. At the waste Shaft Station underground, the Facility Cask Transfer Car moves the Facility Cask from the waste shaft conveyance. A forklift is used to remove the Facility Cask from the Facility Cask Transfer Car and to transport the Facility Cask to the Underground HWDU.

Returning the Empty Cask

The empty RH-TRU 72-B cask or Shielded Insert is returned to the RH Bay by reversing the process. In the RH Bay, swipe samples are collected from inside the empty cask. If necessary, the inside of the cask is decontaminated. The RH-TRU 72-B cask lids are replaced, and the cask is replaced on the trailer using the RH Bay Bridge Crane. The impact limiters are replaced, and the trailer and the RH-TRU 72-B cask are then moved out of the RH Bay. The Shielded Insert is stored in the RH Bay until needed.

A1-1d(4) Handling Waste in Shielded Containers

Remote-Handled TRU mixed waste received at the WIPP facility in shielded containers will be managed, stored, and emplaced as CH TRU mixed waste using the CH TRU mixed waste handling equipment described in this Permit. Shielded containers with RH TRU mixed waste will arrive by tractor-trailer at the WIPP facility in sealed HalfPACTs, at which time they will

undergo security and radiological checks and shipping documentation reviews. Consistent with the handling of HalfPACT shipping packages in Section A1-1d(2), a forklift will remove the HalfPACT and transport it into the WHB and place the HalfPACT at either one of the two TRUDOCKs in the TRUDOCK Storage Area of the WHB Unit.

An external survey of the HalfPACT inner vessel will be performed as the outer containment vessel lid is removed. The inner vessel lid or closure lid will be lifted under the VHS, and the contents will be surveyed during and after this process is complete. A description of the VHS and criteria that are applied if radiological contamination is detected are discussed in Section A1-1d(2).

Shielded containers will be received as three-pack assemblies in HalfPACTs. An overhead bridge crane will be used to remove the contents of the shielded container assembly and place them on a facility pallet. The containers will be visually inspected for physical damage (severe rusting, apparent structural defects, signs of pressurization, etc.) and leakage to ensure they are in good condition prior to storage. Waste containers will also be checked for external surface contamination. If a primary waste container is not in good condition, the Permittees will overpack the container, repair/patch the container in accordance with 49 CFR §173 and §178 (e.g., 49 CFR §173.28), or return the container to the generator.

Once the shielded container assembly is on the facility pallet, the TRU mixed waste container identification numbers will be verified against the Uniform Hazardous Waste Manifest and the WWIS. Inconsistencies will be resolved as discussed in Section A1-1d(2). Up to two three-pack assemblies of shielded containers will be placed on a facility pallet. The use of facility pallets will elevate the waste at least 6 in. (15 cm) from the floor surface. Pallets of waste will then be relocated to the CH Bay Storage Area of the WHB Unit for normal storage or will be transported to the conveyance loading room as described in Section A1-1d(2).

A1-1e Inspections

Inspection of containers and container storage area are required by 20.4.1.500 NMAC (incorporating 40 CFR §264.174). These inspections are described in this section.

A1-1e(1) WHB Unit

The waste containers in storage will be inspected visually or by closed-circuit television camera prior to each movement and, at a minimum, weekly, to ensure that the waste containers are in good condition and that there are no signs that a release has occurred. Waste containers will be visually inspected for physical damage (severe rusting, apparent structural defects, signs of pressurization, etc.) and leakage. If a primary waste container is not in good condition, the Permittees will overpack the container, repair/patch the container in accordance with 49 CFR §173 and §178 (e.g., 49 CFR §173.28), or return the container to the generator. This visual inspection of CH TRU mixed waste containers shall not include the center drums of 7-packs and waste containers positioned such that visual observation is precluded due to the arrangement of waste assemblies on the facility pallets. If waste handling operations should stop for any reason with containers located at the TRUDOCK while still in the Contact-Handled Package, primary waste container inspections will not be accomplished until the containers of waste are removed from the Contact-Handled Package. If the lid to the Contact-Handled Package inner container vessel is removed, radiological checks (swipes of Contact-Handled Package inner surfaces) will be used to determine if there is contamination within the Contact-Handled Package. Such

Table A1-2
Waste Handling Equipment Capacities

CAPACITIES FOR EQUIPMENT	
CH Bay overhead bridge crane	12,000 lbs.
Surface forklifts	26,000 lbs. (CH Bay forklift) 70,000 lbs. (TRUPACT-III Handler forklift)
Facility Pallet	25,000 lbs.
Adjustable center-of-gravity lift fixture	10,000 lbs.
Facility Transfer Vehicle	30,000 lbs.
Yard Transfer Vehicle	60,000 lbs.
MAXIMUM GROSS WEIGHTS OF CONTAINERS	
Seven-pack of 55-gallon drums	7,000 lbs.
Four-pack of 85-gallon drums	4,500 lbs.
Three-pack of 100-gallon drums	3,000 lbs.
Ten-drum overpack	6,700 lbs.
Standard waste box	4,000 lbs.
Standard large box 2	10,500 lbs.
Shielded container	2,260 lbs.
Three-pack of shielded containers	7,000 lbs.
MAXIMUM NET EMPTY WEIGHTS OF EQUIPMENT	
TRUPACT-II	13,140 lbs.
HalfPACT	10,500 lbs.
TRUPACT-III	43,600 lbs.
Adjustable center of gravity lift fixture	2,500 lbs.
Facility pallet	4,120 lbs.

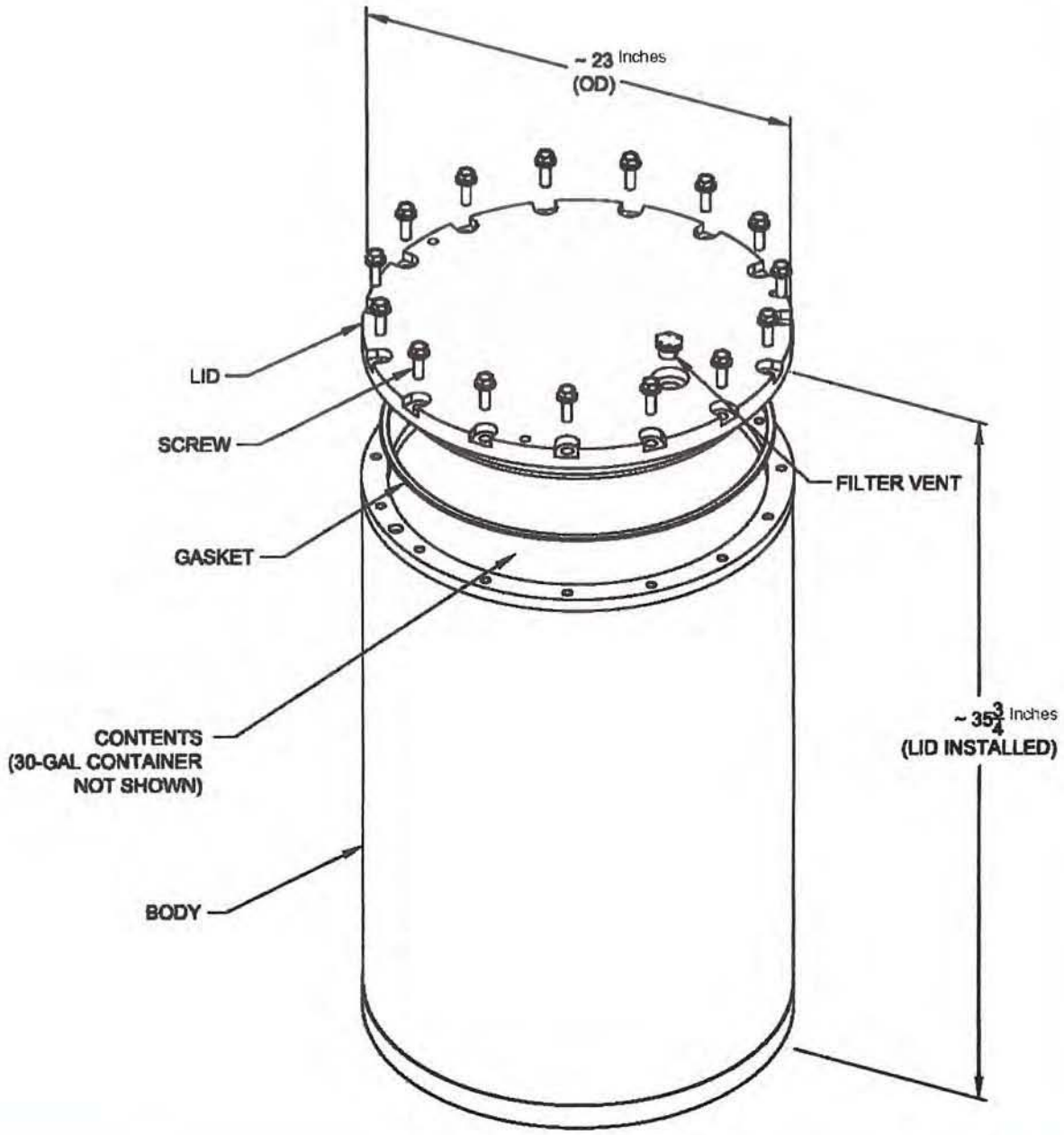

Figure A1-37
Typical Shielded Container

(**SLB2**), and has a rated load of 25,000 pounds (lbs.) (11,430 kilograms (kg)). The facility pallet will accommodate up to four 7-packs, four 3-packs, two 3-packs of shielded containers, ~~or~~ four 4-packs of drums, four SWBs (in two stacks of two units), two TDOPs, or one SLB2. Loads are secured to the facility pallet during transport to the emplacement area. Facility pallets are shown in Figure A2-3. Fork pockets in the side of the pallet allow the facility pallet to be lifted and transferred by forklift to prevent direct contact between TRU mixed waste containers and forklift tines. This arrangement reduces the potential for puncture accidents. WIPP facility operational documents define the operational load of the facility pallet to ensure that the rated load of a facility pallet is not exceeded.

Backfill

Magnesium oxide (**MgO**) will be used as a backfill in order to provide chemical control over the solubility of radionuclides in order to comply with the requirements of 40 CFR §191.13. The MgO backfill will be purchased prepackaged in the proper containers for emplacement in the underground. Purchasing prepackaged backfill eliminates handling and placement problems associated with bulk materials, such as dust creation. In addition, prepackaged materials will be easier to emplace, thus reducing potential worker exposure to radiation. Should a backfill container be breached, MgO is benign and cleanup is simple. No hazardous waste would result from a spill of backfill.

The MgO backfill will be managed in accordance with Specification D-0101 (MgO Backfill Specification) and WP05-WH1025 (CH Waste Downloading and Emplacement). These documents are kept on file at the WIPP facility by the Permittees.

Backfill will be handled in accordance with standard operating procedures. Typical emplacement configurations are shown in Figures A2-5 and A2-5a. Some emplacement configurations may include the use of MgO emplacement racks, as shown in Figure A2-5a.

Quality control will be provided within standard operating procedures to record that the correct number of sacks are placed and that the condition of the sacks is acceptable.

Backfill placed in this manner is protected until exposed when sacks are broken during creep closure of the room and compaction of the backfill and waste. Backfill in sacks utilizes existing techniques and equipment and eliminates operational problems such as dust creation and introducing additional equipment and operations into waste handling areas. There are no mine operational considerations (e.g. ventilation flow and control) when backfill is placed in this manner.

The Waste Shaft Conveyance

The hoist systems in the shafts and all shaft furnishings are designed to resist the dynamic forces of the hoisting system and to withstand a design-basis earthquake of 0.1 g. Appendix D2 of the WIPP RCRA Part B Permit Application (DOE, 1997) provided engineering design-basis earthquake report which provides the basis for seismic design of WIPP facility structures. The waste hoist is equipped with a control system that will detect malfunctions or abnormal operations of the hoist system (such as overtravel, overspeed, power loss, circuitry failure, or starting in a wrong direction) and will trigger an alarm that automatically shuts down the hoist.

A2-2b Geologic Repository Process Description

Prior to receipt of TRU mixed waste at the WIPP facility, waste operators will be thoroughly trained in the safe use of TRU mixed waste handling and transport equipment. The training will include both classroom training and on-the-job training.

RH TRU Mixed Waste Emplacement

The Facility Cask Transfer Car is loaded onto the waste shaft conveyance and is lowered to the waste shaft station underground. At the waste shaft station underground, the Facility Cask is moved from the waste shaft conveyance by the Facility Cask Transfer Car (Figure A2-16). A forklift is used to remove the Facility Cask from the Facility Cask Transfer Car and to transport the Facility Cask to the Underground HWDU. There, the Facility Cask is placed on the HERE (Figure A2-17). The HERE is used to emplace the RH TRU mixed waste canister into the borehole. The borehole will be visually inspected for obstructions prior to aligning the HERE and emplacement of the RH TRU mixed waste canister. The Facility Cask is moved forward to mate with the shield collar, and the transfer carriage is advanced to mate with the rear Facility Cask shield valve. The shield valves on the Facility Cask are opened, and the transfer mechanism advances to push the canister into the borehole. After retracting the transfer mechanism into the Facility Cask, the forward shield valve is closed, and the transfer mechanism is further retracted into its housing. The transfer mechanism is moved to the rear, and the shield plug carriage containing a shield plug is placed on the emplacement machine. The transfer mechanism is used to push the shield plug into the Facility Cask. The front shield valve is opened, and the shield plug is pushed into the borehole (Figure A2-18). The transfer mechanism is retracted, the shield valves close on the Facility Cask, and the Facility Cask is removed from the HERE.

A shield plug is a concrete filled cylindrical steel shell (Figure A2-21) approximately 61 in. long and 29 in. in diameter, made of concrete shielding material inside a 0.24 in. thick steel shell with a removable pintle at one end. Each shield plug has integral forklift pockets and weighs approximately 3,750 lbs. The shield plug is inserted with the pintle end closest to the HERE to provide the necessary shielding , limiting the borehole radiation dose rate at 30 cm to less than 10 mrem per hour for a canister surface dose rate of 100 rem/hr . Additional shielding is provided at the direction of the Radiological Control Technician based on dose rate surveys following shield plug emplacement. This additional shielding is provided by the manual emplacement of one or more shield plug supplemental shielding plates and a retainer (Figures A2-19 and A2-20).

The amount of RH TRU mixed waste disposal in each panel is limited based on thermal and geomechanical considerations and shall not exceed 10 kilowatts per acre as described in Permit Attachment A2-1. RH TRU mixed waste emplacement boreholes shall be drilled in the ribs of the panels at a nominal spacing of 8 ft (2.4 m) center-to-center, horizontally.

Figures A1-26 and A1-27 are flow diagrams of the RH TRU mixed waste handling process for the RH-TRU 72-B and CNS 10-160B casks, respectively.

CH TRU Mixed Waste Emplacement

CH TRU mixed waste containers and shielded containers will arrive by tractor-trailer at the WIPP facility in sealed shipping containers ~~(e.g., TRUPACT-IIs or HalfPACTs)~~, at which time they will undergo security and radiological checks and shipping documentation reviews. The

trailers carrying the shipping containers will be stored temporarily at the Parking Area Container Storage Unit (Parking Area Unit). A forklift will remove the Contact Handled Packages from the transport trailers and a forklift or Yard Transfer Vehicle will transport them into the Waste Handling Building Container Storage Unit for unloading of the waste containers. Each TRUPACT-II may hold up to two 7-packs, two 4-packs, two 3-packs, two SWBs, or one TDOP. Each HalfPACT may hold up to seven 55-gal (208 L) drums, one SWB, one three-pack of shielded containers or four 85-gal (322 L) drums. Each TRUPACT-III will hold one SLB2. An overhead bridge crane or Facility Transfer Vehicle with transfer table will be used to remove the waste containers from the Contact Handled Packaging and place them on a facility or containment pallet. Each facility pallet has two recessed pockets to accommodate two sets of 7-packs, two sets of 3-packs, two sets of 4-packs, two SWBs stacked two-high, two TDOPs, or one SLB2. Each stack of waste containers will be secured prior to transport underground (see Figure A2-3). A forklift or the facility transfer vehicle will transport the loaded facility pallet to the conveyance loading room adjacent to the Waste Shaft. The facility transfer vehicle will be driven onto the waste shaft conveyance deck, where the loaded facility pallet will be transferred to the waste shaft conveyance, and the facility transfer vehicle will be backed off. Containers of CH TRU mixed waste (55-gal (208 L) drums, SWBs, 85-gal (322 L) drums, 100-gal (379 L) drums, and TDOPs) or shielded containers can be handled individually, if needed, using the forklift and lifting attachments (i.e., drum handlers, parrot beaks).

The waste shaft conveyance will lower the loaded facility pallet to the underground. At the waste shaft station, the CH TRU underground transporter will back up to the waste shaft conveyance, and the facility pallet will be transferred from the waste shaft conveyance onto the transporter (see Figure A2-6). The transporter will then move the facility pallet to the appropriate Underground HWDU for emplacement. The underground waste transporter is equipped with a fire suppression system, rupture-resistant diesel fuel tanks, and reinforced fuel lines to minimize the potential for a fire involving the fuel system.

A forklift in the HWDU near the waste stack will be used to remove the waste containers from the facility pallets and to place them in the waste stack using a push-pull attachment or, in the case of an SLB2, the SLB2 will be lifted from the facility pallet and placed directly on the floor of the emplacement room. The waste will be emplaced room by room in Panels 1 through 8. Each panel will be closed off when filled. If a waste container is damaged during the Disposal Phase, it will be immediately overpacked or repaired. CH TRU mixed waste containers will be continuously vented. The filter vents will allow aspiration, preventing internal pressurization of the container and minimizing the buildup of flammable gas concentrations.

Once a waste panel is mined and any initial ground control established, flow regulators will be constructed to assure adequate control over ventilation during waste emplacement activities. The first room to be filled with waste will be Room 7, which is the one that is farthest from the main access ways. A ventilation control point will be established for Room 7 just outside the exhaust side of Room 6. This ventilation control point will consist of a bulkhead with a ventilation regulator. When RH TRU mixed waste canister emplacement is completed in a room, CH TRU mixed waste emplacement can begin in that room. Stacking of CH waste will begin at the ventilation control point and proceed down the access drift, through the room and up the intake access drift until the entrance of Room 6 is reached. At that point, a brattice cloth and chain link barricade and, if necessary, bulkheads will be emplaced. This process will be repeated for Room 6, and so on until Room 1 is filled. At that point, the panel closure system will be constructed.

Table A2-1
CH TRU Mixed Waste Handling Equipment Capacities

Capacities for Equipment	
Facility Pallet	25,000 lbs.
Facility Transfer Vehicle	26,000 lbs.
Underground transporter	28,000 lbs.
Underground forklift	12,000 lbs.
Maximum Gross Weights of Containers	
Seven-pack of 55-gallon drums	7,000 lbs.
Four-pack of 85-gallon drums	4,500 lbs.
Three-pack of 100-gallon drums	3,000 lbs.
Ten-drum overpack	6,700 lbs.
Standard waste box	4,000 lbs.
Standard large box 2	10,500 lbs.
Shielded container	2,260 lbs.
Three-pack of shielded containers	7,000 lbs.
Maximum Net Empty Weights of Equipment	
TRUPACT-II	13,140 lbs.
HalfPACT	10,500 lbs.
TRUPACT-III	43,600 lbs.
Facility pallet	4,120 lbs.

GECSB = 1.2 - (0.21x 2.07) - (0.33 x 1.2) ⇒ 0.37'
TCBS = 0.37/1.0 = 0.37' ~ 4½"

Based on the results of the above calculation, the site paved roads designated for waste transportation are safe to be used by the heavier truckloads carrying shipping casks used in RH TRU mixed waste transportation to the WIPP.

A4-3 Waste Handling Building Traffic

CH TRU mixed waste will arrive by tractor-trailer at the WIPP facility in sealed Contact Handled Packages. Upon receipt, security checks, radiological surveys, and shipping documentation reviews will be performed. A forklift or Yard Transfer Vehicle will remove the Contact Handled Packages and transport them a short distance through an air lock that is designed to maintain differential pressure in the WHB. The forklift or Yard Transfer Vehicle will place the shipping containers at one of the two TRUPACT-II unloading docks (**TRUDOCK**) inside the WHB or, in the case of the TRUPACT-III, at the payload transfer station in Room 108.

The TRUPACT-II may hold up to two 55-gallon drum seven-packs, two 85-gallon drum four-packs, two 100-gallon drum three-packs, two standard waste boxes (SWB), or one ten-drum overpack (**TDOP**). A HalfPACT may hold seven 55-gallon drums, one SWB, one shielded container 3-pack, or four 85-gallon drums. The TRUPACT-III holds a single SLB2. A six-ton overhead bridge crane or Facility Transfer Vehicle with a transfer table will be used to remove the contents of the Contact Handled Package. Waste containers will be surveyed for radioactive contamination and decontaminated or returned to the Contact Handled Package as necessary.

Each facility pallet will accommodate four 55-gallon drum seven-packs, four SWBs, four 85-gallon drum four-packs, four 100-gallon drum three-packs, two shielded container 3-packs, two TDOPs, or an SLB2. Waste containers will be secured to the facility pallet prior to transfer. A forklift or facility transfer vehicle will transport the loaded facility pallet the air lock at the Waste Shaft (Figures A4-3, A4-3a, and A4-3b). The facility transfer vehicle will be driven onto the waste shaft conveyance deck, where the loaded facility pallet will be transferred to the waste shaft conveyance and downloaded for emplacement.

RH TRU mixed waste will arrive at the WIPP facility in a payload container contained in a shielded cask loaded on a tractor-trailer. Upon arrival, radiological surveys, security checks, and shipping documentation reviews will be performed, and the trailer carrying the cask will be moved into the Parking Area or directly into the RH Bay of the Waste Handling Building Unit.

The cask is unloaded from the trailer in the RH Bay and is placed on the Cask Transfer Car. The Cask Transfer Car is used to move the cask to the Cask Unloading Room. At this point, a crane moves the waste to the Hot Cell or the Transfer Cell. Some RH TRU mixed waste may be moved to the Hot Cell for overpacking before being moved to the Transfer Cell. Once in the Transfer Cell, the Transfer Cell Shuttle Car moves the waste beneath the facility cask. A crane is used to move the waste from the Transfer Cell Shuttle Car into the facility cask. The Facility Cask Transfer Car then moves the facility cask to the underground. A more detailed description of waste handling in the WHB is included in Attachment M1. Figures A4-5, A4-6 and A4-7 show RH TRU mixed waste transport routes.

ATTACHMENT C1

WASTE CHARACTERIZATION SAMPLING METHODS

Introduction

The Permittees will require generator/storage sites (**sites**) to use the following methods, as applicable, for characterization of TRU mixed waste which is managed, stored, or disposed at WIPP. These methods include requirements for headspace-gas sampling, sampling of homogeneous solids and soil/gravel, and radiography or visual examination. Additionally, this Attachment provides quality control, sample custody, and sample packing and shipping requirements.

C1-1 Sampling of Debris Waste (Summary Category S5000)

Headspace gas sampling and analysis shall be used to resolve the assignment of Environmental Protection Agency (**EPA**) hazardous waste numbers to debris waste streams.

C1-1a Method Requirements

The Permittees shall require all headspace-gas sampling be performed in an appropriate radiation containment area on waste containers that are in compliance with the container equilibrium requirements (i.e., 72 hours at 18° C or higher).

For those waste streams without an acceptable knowledge (**AK**) Sufficiency Determination approved by the U.S. Department of Energy (**DOE**), containers shall be randomly selected from waste streams designated as summary category S5000 (Debris waste) and shall be categorized under one of the sampling scenarios shown in Table C1-5 and depicted in Figure C1-1. If the container is categorized under Scenario 1, the applicable drum age criteria (**DAC**) from Table C1-6 must be met prior to headspace gas sampling. If the container is categorized under Scenario 2, the applicable Scenario 1 DAC from Table C1-6 must be met prior to venting the container and then the applicable Scenario 2 DAC from Table C1-7 must be met after venting the container. The DAC for Scenario 2 containers that contain filters or rigid liner vent holes other than those listed in Table C1-7 shall be determined using footnotes "a" and "b" in Table C1-7. Containers that have not met the Scenario 1 DAC at the time of venting must be categorized under Scenario 3. Containers categorized under Scenario 3 must be placed into one of the Packaging Configuration Groups listed in Table C1-8. If a specific packaging configuration cannot be determined based on the data collected during packaging and/or repackaging (Attachment C, Section C-3d(1)), a conservative default Packaging Configuration Group of 3 for 55-gallon drums and shielded containers, 6 for Standard Waste Boxes (**SWBs**) ten-drum overpacks (**TDOPs**), and standard larged box 2s (**SLB2s**), and 8 for 85-gallon and 100-gallon drums must be assigned, provided the drums do not contain pipe component packaging. If a container is designated as Packaging Configuration Group 4 (i.e., a pipe component), the headspace gas sample must be taken from the pipe component headspace. Drums, TDOPs, SLB2s, or SWBs that contain compacted 55-gallon drums containing a rigid liner may not be disposed of under any packaging configuration unless headspace gas sampling was performed before compaction in accordance with this waste analysis plan (**WAP**). The DAC for Scenario 3 containers that contain rigid liner vent holes that are undocumented during packaging, repackaging, and/or venting (Section C1-1a[4][ii]) shall be determined using

the default conditions in footnote "b" in Table C1-9.The DAC for Scenario 3 containers that contain filters that are either undocumented or are other than those listed in Table C1-9 shall be determined using footnote 'a' in Table C1-9. Each of the Scenario 3 containers shall be sampled for headspace gas after waiting the DAC in Table C1-9 based on its packaging configuration (note: Packaging Configuration Groups 4, 5, 6, 7, and 8 are not summary category group dependent, and 85-gallon drum, 100-gallon drum, SWB, TDOP, and SLB2 requirements apply when the 85-gallon drum, 100-gallon drum, SWB, TDOP, or SLB2 is used for the direct loading of waste).

C1-1a(1) General Requirements

The determination of packaging configuration consists of identifying the number of confinement layers and the identification of rigid poly liners when present. Generator/storage sites shall use either the default conditions specified in Tables C1-7 through C1-9 for retrievably stored waste or the data documented during packaging, repackaging, and/or venting (Section C1-1a[4][ii]) for determining the appropriate DAC for each container from which a headspace gas sample is collected. These drum age criteria are to ensure that the container contents have reached 90 percent of steady state concentration within each layer of confinement (Lockheed, 1995; BWXT, 2000). The following information must be reported in the headspace gas sampling documents for each container from which a headspace gas sample is collected:

- sampling scenario from Table C1-5 and associated information from Tables C1-6 and/or Table C1-7;
- the packaging configuration from Table C1-8 and associated information from Table C1-9, including the diameter of the rigid liner vent hole, the number of inner bags, the number of liner bags, the presence/absence of drum liner, and the filter hydrogen diffusivity,
- the permit-required equilibrium time,
- the drum age,
- for supercompacted waste, both
  - the absence of rigid liners in the compacted 55-gallon drums which have not been headspace gas sampled in accordance with this permit prior to compaction, and
  - the absence of layers of confinement must be documented in the WWIS if Packaging Configuration Group 7 is used.

For all retrievably stored waste containers, the rigid liner vent hole diameter must be assumed to be 0.3 inches unless a different size is documented during drum venting or repackaging. For all retrievably stored waste containers, the filter hydrogen diffusivity must be assumed to be the most restrictive unless container-specific information clearly identifies a filter model and/or diffusivity characteristic that is less restrictive. For all retrievably stored waste containers that have not been repackaged, acceptable knowledge shall not be used to justify any packaging configuration less conservative than the default (i.e., Packaging Configuration Group 3 for 55-gallon drums and shielded containers, 6 for SWBs TDOPs, and SLB2s, and 8 for 85-gallon and

100-gallon drums). For information reporting purposes listed above, sites may report the default packaging configuration for retrievably stored waste without further verification.

All waste containers with unvented rigid containers greater than 4 liters (exclusive of rigid poly liners) shall be subject to innermost layer of containment sampling or shall be vented prior to initiating drum age and equilibrium criteria. When sampling the rigid poly liner under Scenario 1, the sampling device must form an airtight seal with the rigid poly liner to ensure that a representative sample is collected (using a sampling needle connected to the sampling head to pierce the rigid poly liner, and that allows for the collection of a representative sample, satisfies this requirement). The configuration of the containment area and remote-handling equipment at each sampling facility are expected to differ. Headspace-gas samples will be analyzed for the analytes listed in Table C3-2 of Permit Attachment C3. If additional packaging configurations are identified, an appropriate Permit Modification will be submitted to incorporate the DAC using the methodology in BWXT (2000). Consistent with footnote "a" in Table C1-8, any waste container selected for headspace gas sampling that cannot be assigned a packaging configuration specified in Table C1-8 shall be assigned a conservative default packaging configuration..

Drum age criteria apply only to 55-gallon drums, 85-gallon drums, 100-gallon drums, SWBs, TDOPs, ~~and~~ SLB2s, and shielded containers. Drum age criteria for all other container types must be established through permit modification prior to performing headspace gas sampling.

The Permittees shall require site personnel to collect samples in SUMMA® or equivalent canisters using standard headspace-gas sampling methods that meet the general guidelines established by the EPA in the Compendium Method TO-14A or TO-15, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air (EPA, 1999) or by using on-line integrated sampling/analysis systems. Samples will be directed to an analytical instrument instead of being collected in SUMMA® or equivalent canisters if a single-sample on-line integrated sampling/analysis system is used. If a multi-sample on-line integrated sampling/analysis system is used, samples will be directed to an integrated holding area that meets the cleaning requirements of Section C1-1c(1). The leak proof and inert nature of the integrated holding area interior surface must be demonstrated and documented. Samples are not transported to another location when using on-line integrated sampling/analysis systems; therefore, the sample custody requirements of Section C1-4 and C1-5 do not apply. The same sampling manifold and sampling heads are used with on-line integrated sampling/analysis systems and all of the requirements associated with sampling manifolds and sampling heads must be met. However, when using an on-line integrated sampling/analysis system, the sampling batch and analytical batch quality control (**QC**) samples are combined as on-line batch QC samples as outlined in Section C1-1b.

C1-1a(2) Manifold Headspace Gas Sampling

This headspace-gas sampling protocol employs a multiport manifold capable of collecting multiple simultaneous headspace samples for analysis and QC purposes. The manifold can be used to collect samples in SUMMA® or equivalent canisters or as part of an on-line integrated sampling/analysis system. The sampling equipment will be leak checked and cleaned prior to first use and as needed thereafter. The manifold and sample canisters will be evacuated to 0.0039 inches (in.) (0.10 millimeters [mm]) mercury (**Hg**) prior to sample collection. Cleaned and evacuated sample canisters will be attached to the evacuated manifold before the manifold inlet valve is opened. The manifold inlet valve will be attached to a changeable filter connected to either a side port needle sampling head capable of forming an airtight seal (for penetrating a

Table C1-8
Scenario 3 Packaging Configuration Groups

Packaging Configuration Group	Covered S5000 Packaging Configuration Groups
Packaging Configuration Group 1, 55-gal drums [a]	• No layers of confinement, filtered inner lid [b] • No inner bags, no liner bags (bounding case)
Packaging Configuration Group 2, 55-gal drums [a]	• 1 inner bag • 1 filtered inner bag • 1 liner bag • 1 filtered liner bag • 1 inner bag, 1 liner bag • 1 filtered inner bag, 1 filtered liner bag • 2 inner bags • 2 filtered inner bags • 2 inner bags, 1 liner bag • 2 filtered inner bags, 1 filtered liner bag • 3 inner bags • 3 filtered inner bags • 3 filtered inner bags, 1 filtered liner bag • 3 inner bags, 1 liner bag (bounding case)
Packaging Configuration Group 3, 55-gal drums and shielded containers [a]	• 2 liner bags • 2 filtered liner bags • 1 inner bag, 2 liner bags • 1 filtered inner bag, 2 filtered liner bags • 2 inner bags, 2 liner bags • 2 filtered inner bags, 2 filtered liner bags • 3 filtered inner bags, 2 filtered liner bags • 4 inner bags • 3 inner bags, 2 liner bags • 4 inner bags, 2 liner bags (bounding case)
Packaging Configuration Group 4, pipe components	• No layers of confinement inside a pipe component • 1 filtered inner bag, 1 filtered metal can inside a pipe component • 2 inner bags inside a pipe component • 2 filtered inner bags inside a pipe component • 2 filtered inner bags, 1 filtered metal can inside a pipe component • 2 inner bags, 1 filtered metal can inside a pipe component (bounding case)
Packaging Configuration Group 5, Standard Waste Box, Ten-Drum Overpack, or Standard Large Box 2 [a]	• No layers of confinement • 1 SWB liner bag (bounding case)
Packaging Configuration Group 6, Standard Waste Box, Ten-Drum Overpack, or Standard Large Box 2 [a]	• any combination of inner and/or liner bags that is less than or equal to 6 • 5 inner bags, 1 SWB liner bag (bounding case)

Packaging Configuration Group	Covered S5000 Packaging Configuration Groups
Packaging Configuration Group 7, 85-gal. drums and 100-gal. drums [a]	• No inner bags, no liner bags, no rigid liner, filtered inner lid (bounding case) [b] • No inner bags, no liner bags, no rigid liner
Packaging Configuration Group 8, 85-gal. drums and 100-gal. drums [a]	• 4 inner bags and 2 liner bags, no rigid liner, filtered inner lid (bounding case) [b]

[a] If a specific Packaging Configuration Groups cannot be determined based on the data collected during packaging and/or repackaging, a conservative default Packaging Configuration Group of 3 for 55-gallon drums and shielded containers, 6 for SWBs, TDOPs, and SLB2s, and 8 for 85-gallon and 100-gallon drums must be assigned provided the drums do not contain pipe component packaging. If pipe components are present as packaging in the drums, the pipe components must be sampled following the requirements for Packaging Configuration Group 4.

[b] A "filtered inner lid" is the inner lid on a double lid drum that contains a filter.

Definitions:

Liner Bags: One or more optional plastic bags that are used to control radiological contamination. Liner bags for drums have a thickness of approximately 11 mils. Liner bags are typically similar in size to the container. SWB liner bags have a thickness of approximately 14 mils. TDOPs and SLB2s use SWB liner bags.

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

Wastes may be generated at the WIPP facility as a direct result of managing the TRU and TRU mixed wastes received from the off-site generators. Such generated waste may occur in either the WHB Unit or the Underground. For example, when TRU mixed wastes are received at the WHB Unit, the CH or RH Package shipping containers and the TRU mixed waste containers are checked for surface contamination. Under some circumstances,[1] if contamination is detected, the shipping container and/or the TRU mixed waste containers will be decontaminated. In the underground, waste may be generated as a result of radiation control procedures used during monitoring activities. The waste generated from radiation control procedures will be assumed to be TRU and/or TRU mixed waste. Throughout the remainder of this plan, this waste is referred to as "derived waste." All such derived waste will be placed in the rooms in HWDUs along with the TRU mixed waste for disposal.

D-1c Containers

The waste containers that will be used at the WIPP facility qualify as "containers," in accordance with 20.4.1.101 NMAC (incorporating 40 CFR §260.10). That is, they are "portable devices in which a material is stored, transported, treated, disposed of, or otherwise handled."

TRU mixed waste containers, containing off-site waste, will not be opened at the WIPP facility. Derived waste containers are kept closed at all times unless waste is being added or removed.

Waste, including "derived waste," containing liquid in excess of TSDF-WAC limits shall not be emplaced in the WIPP (See Permit Attachment C, Section C-1c).

Special requirements for ignitable, reactive, and incompatible waste are addressed in 20.4.1.500 NMAC (incorporating 40 CFR §§264.176 and 177). The RCRA Permit Treatment, Storage, and Disposal Facility Waste Acceptance Criteria (**TSDF-WAC**) precludes ignitable, reactive, or incompatible TRU mixed waste from being placed into storage or disposed of at WIPP.

D-1d Description of Containers

CH TRU mixed waste containers will be either 55-gallon (gal) (208-liter (L)) drums singly or arranged into seven (7)-packs, 85-gal (322-L) drums (used as singly or arranged into four (4)-packs, 100-gal (379 L) drums singly or arranged into three (3)-packs, ten-drum overpacks (**TDOP**), 66.3 ft^3 (1.88 m^3) SWBs, or standard large box 2s (**SLB2**).

RH TRU mixed waste containers are either canisters or drums. Canisters will be loaded singly in an RH-TRU 72-B cask and drums will be loaded in a CNS 10-160B cask. Drums in the CNS 10-160B cask will be arranged singly or in drum carriage units containing up to five drums each. Canisters and drums are described in Permit Attachment M1.

Remote-Handled TRU mixed waste may arrive in shielded containers with an internal capacity of 4.0 ft^3 (0.11 m^3). Shielded containers will be arranged as three-packs.

[1] Typically contamination that is less than six square feet in area and less than 2000 disintegrations per minute (dpm) alpha or 20,000 dpm beta/gamma, may be decontaminated. Containers that exceed these thresholds will be returned to the point of origin for decontamination.

D-1e Description of Surface Hazardous Waste Management Units

The WHB is the surface facility where waste handling activities will take place. The WHB has a total area of approximately 84,000 square feet (ft^2) (7,804 square meters [m^2]) of which 49,710 ft^2 (4,618 m^2) are designated as the WHB Unit for TRU mixed waste management. Within the WHB Unit, 32,307 ft^2 (3,001 m^2) are designated for the waste handling and container storage of CH TRU mixed waste and 17,403 ft^2 (1,617 m^2) are designated for the handling and storage of RH TRU mixed waste. These areas are being permitted as container storage units. The concrete floors within the WHB Unit are sealed with an impermeable coating that has excellent resistance to the chemicals in TRU mixed waste and, consequently, provide secondary containment for TRU mixed waste. In addition, a Parking Area Unit south of the WHB will be used for storage of waste in sealed shipping containers awaiting unloading. This area is also being permitted as a container storage unit. The sealed shipping containers provide secondary containment in this hazardous waste management unit (**HWMU**).

D-1e(1) CH Bay Operations

Once unloaded from the Contact-Handled Package, CH TRU mixed waste containers (3-pack of shielded containers, 7-packs of 55-gal drums, 3-packs of 100-gal drums, 4-packs of 85-gal drums, SWBs, TDOPs, or one SLB2) are placed on the facility pallet. The waste containers are stacked on the facility pallets (one- or two-high, depending on weight considerations). The use of facility pallets will elevate the waste at least 6 inches (in.) (15 centimeters [cm]) from the floor surface. Pallets of waste will then be stored in the CH bay. This storage area will be clearly marked to indicate the lateral limits of the storage area. This storage area will have a maximum capacity of thirteen facility pallets of waste during normal operations. These pallets will typically be in the CH Bay storage area for a period of up to five days.

In addition, four Contact-Handled Packages, containing up to 640 ft^3 of CH TRU waste in containers, may occupy positions at the TRUPACT-II Unloading Docks (**TRUDOCK**).

Aisle space shall be maintained in all CH Bay waste storage areas. The aisle space shall be adequate to allow unobstructed movement of fire response personnel, spill-control equipment, and decontamination equipment that would be used in the event of an off-normal event. An aisle space between facility and containment pallets will be maintained in all CH TRU mixed waste storage areas.

D-1e(2) RH Complex Operations

Loaded RH TRU casks are received in the RH Bay of the WHB. The RH Bay is served by an overhead bridge crane used for cask handling and maintenance operations. Storage in the RH Bay occurs in the RH-TRU 72-B or CNS 10-160B casks. A maximum of two loaded casks may be stored in the RH Bay and a maximum of one cask in the Cask Unloading Room may be stored at one time. A minimum of 44 inches (1.1 m) will be maintained between loaded casks in the RH Bay. The cask serves as secondary containment in the RH Bay for the RH TRU mixed waste payload container. In addition, the RH Bay has a concrete floor.

Single RH TRU mixed waste canisters are unloaded from the RH-TRU 72-B casks in the Transfer Cell of the RH Complex where they are transferred to facility casks. Drums of RH TRU mixed waste will be transferred remotely from the CNS 10-160B cask, into the Hot Cell, and loaded into a canister. Storage in the Hot Cell occurs in either drums or canisters. A maximum

equipment to control and plug leaks may be utilized for response to all levels of incidents.

F. Transfer refers to the process of moving a liquid, gas, or some forms of solids, either manually or by pump, from a leaking or damaged container. Scoops, shovels, jugs, and pails as well as drum transfer pumps for chemical and petroleum transfer are utilized as needed in response to all levels of incidents.

G. Vapor Suppression refers to the reduction or elimination of vapors emanating from a spilled or released material through the most efficient method or application of specially designed agents such as an aqueous foam blanket.

2. Chemical Methods of Mitigation

A. Neutralization is the process of applying acids or bases to a spill to form a neutral salt. The application of solids for neutralizing can often result in confinement of the spilled material. This would include using the neutralizing adsorbents.

B. Solidification is the process whereby a hazardous liquid is added to material such as an absorbent so that a solid material results.

The established procedures are based upon the incident level and a graded approach for nonradioactive or CH TRU waste emergencies and initiated to:

1. Minimize contamination or contact (through PPE, etc.)
2. Limit migration of contaminants
3. Properly dispose of contaminated materials

For RH TRU mixed waste that is not managed in shielded containers, the detection of contamination on or damage to a RH TRU mixed waste canister or a facility canister may occur outside the Hot Cell during cask to cask transfer of the canister or during loading of the Shielded Insert in the Transfer Cell. When such contamination or damage is found, the Permittees have the option to decontaminate or return the canister to the generator/storage site or another site for remediation. In the case of a damaged facility canister, the Shielded Insert may be used as an overpack to facilitate further management. Contamination may also be detected within the Hot Cell during the unloading of the CNS 10-160B shipping cask. In this case, the Permittees may decontaminate the 55-gallon drums or return them to the generator/storage site or another site for remediation. Spills or releases that occur within the RH Complex or the underground as the result of RH TRU mixed waste handling will be mitigated by using appropriate measures which may include the items above.

D-4d(2) Fire

The incident level emergency response identified in Section D-3 includes fire/explosion potential. WIPP fire response includes incipient, exterior structure fires, and internal structure fires. The RCRA Emergency Coordinator can implement the Memoranda of Understanding (**MOU**) for additional support.

The first option in mine fire response will be to apply mechanical methods to stop fires (e.g., cut electrical power). The last option in mine fire response will be to reconfigure ventilation using

8. No TRU mixed waste that may be incompatible with the released material will be managed in the affected area until cleanup procedures are complete.

9. The RCRA Emergency Coordinator will direct spill control, decontamination, and termination procedures described below.

D-4d(5) Decontamination of Personnel

Decontamination of personnel with radioactive contamination is the responsibility of the Radiological Control (**RC**) section. If a person is contaminated with radioactivity during a site evacuation to the staging areas, the contaminated area will be covered before the person can be moved (under escort by RC personnel) to the staging area. The RC personnel will ensure the contaminated person remains segregated from other site personnel while under RC supervision.

In the event of an emergency that requires immediate evacuation of the area, the contamination can be covered by any method warranted, given the circumstance (e.g., clean clothing wrapped around the area). If the size of the radioactive contamination on the body is small and localized, it can be covered with clothing (e.g., glove, shoe cover, coveralls). If the size of the radioactive contamination on the body is large, it may be covered by dressing the individual in a full set of Anti-Contamination clothing (coveralls, hood, gloves, shoe covers, etc.).

If time and location permit and the contamination is on the face, it will be decontaminated immediately using a cloth moistened with tepid water (and a mild detergent, if necessary). If the size of the radioactive contamination on the individual's body is small and localized, it will be decontaminated using the same method as for the face, but after the individual has been transferred to an area appropriate for conducting decontamination.

If the individual is transferred to the staging area prior to decontamination, he/she will be decontaminated at the staging area using site procedures for personnel decontamination and using decontamination supplies and equipment as appropriate for the extent and magnitude of the contamination.

D-4d(6) Control of Spills or Leaking or Punctured Containers of CH and RH TRU Mixed Waste

In the event of spills or leaking or punctured containers of CH and RH TRU mixed waste, the WIPP responds to three distinct phases: 1) the event, 2) the re-entry, and 3) the recovery.

During the event, the following immediate actions are completed: 1) stop work, 2) warn others (notify CMR), 3) isolate the area, 4) minimize exposure, and 5) close off unfiltered ventilation. These actions can take place simultaneously, as long as they are completed before proceeding to the re-entry phase.

CH TRU Mixed Waste

Prior to the re-entry following an event involving containers that are managed as ~~of~~ CH TRU mixed waste, a Radiological Work Permit (**RWP**) is written for personnel to enter with protective clothing to assess the conditions, take surveys and samples, and mitigate problems that could compound the hazards in the area (cover up spilled material with plastic material sheeting and or any approved fixatives such as polyvinyl alcohol (**PVA**) or paint, place equipment in a safe configuration, etc.). During the re-entry phase, smears and air sample filters are taken and

E-1a(2) Frequency of Inspections

Tables E-1, E-1a, and E-2 of this Permit Attachment list the inspection frequencies and monitoring schedule for equipment and systems subject to the 20.4.1 NMAC hazardous waste management requirements. The frequency is based on the rate of possible deterioration of the equipment and the probability of an environmental or human health incident if the deterioration or malfunction, or any operator error, goes undetected between inspections. Areas subject to spills, such as loading and unloading areas, are inspected daily when in use, consistent with the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.15(b)(4)).

When RH TRU mixed waste is present in the RH Complex, inspections are conducted visually and/or using closed-circuit video cameras in order to manage worker dose and to minimize occupational radiation exposures to as low as reasonably achievable (**ALARA**). More extensive inspections of these areas are performed at least annually during routine maintenance periods and when RH TRU mixed waste is not present.

E-1a(3) Monitoring Systems

There are two monitoring systems used at the WIPP to provide assurance that facility systems are operating correctly, that areas can be used safely, and that there have been no releases of hazardous waste constituents. These systems are shown in Table E-2 and include the geomechanical monitoring system and the central monitoring system (**CMS**). The geomechanical monitoring system is used to assess the condition of mined excavations to assure no unsafe conditions are allowed to develop. The CMS continuously assesses the status of the fixed radiation monitoring equipment, electrical power, fire alarm systems, ventilation system, and other facility systems including water tank levels. In addition, the CMS collects data from the meteorological monitoring system.

E-1b Specific Process Inspection Requirements

20.4.1.500 NMAC (incorporating 40 CFR §264.15(b)(4)), requires inspections of specific portions of a facility, rather than the general facility. These include container storage areas and miscellaneous units. Both are addressed below.

E-1b(1) Container Inspection

Containers are used to manage TRU mixed waste at the WIPP facility. These containers are described in Permit Part 3. Off-site ~~CH TRU mixed~~ waste that will be managed and stored as CH TRU mixed waste will arrive in 55-gallon drums arranged as seven (7)-packs, in Ten Drum Overpacks (**TDOP**), in 85-gallon drums arranged as four (4) packs, in 100-gallon drums arranged as three (3) packs, in standard waste boxes (**SWB**), ~~or~~ in standard large box 2s (**SLB2s**) or shielded containers as (3)-packs. The waste containers will be visually inspected to ensure that the waste containers are in good condition and that there are no signs that a release has occurred. This visual inspection shall not include the center drums of 7-packs and waste containers positioned such that visual observation is precluded due to the arrangement of waste assemblies on the facility pallets. If CH TRU mixed waste handling operations should stop for any reason with containers located on the TRUPACT-II Unloading Dock (**TRUDOCK** storage area of the WHB Unit) or in room 108 while still in the Contact-Handled Packages, primary waste container inspections could not be accomplished until the containers of waste are removed from the shipping containers.

As described in Permit Attachment A1, Section A1-1d(3), off-site waste that will be managed and stored as RH TRU mixed waste will arrive in containers inside Nuclear Regulatory Commission (**NRC**)-certified casks designed to provide shielding and facilitate safe handling. Canisters, will be loaded singly into an RH-TRU 72-B cask. Drums will be loaded into a CNS 10-160B cask. The cask will be visually inspected upon arrival. Because RH TRU mixed waste is stored in the Parking Area Unit in sealed casks, there are no additional requirements for engineered secondary containment systems. Following removal of the canisters and drums, the interior of the cask will be inspected and surveyed for evidence of contamination that may have occurred during transport.

Off-site waste that will be managed and stored as RH TRU mixed waste is ~~handled~~ managed and stored in the RH Complex of the WHB. The RH Complex includes the following: RH Bay, the Cask Unloading Room, the Hot Cell, the Transfer Cell, and the Facility Cask Loading Room. As RH TRU mixed waste is held in canisters within a canister rack the physical inspection of the drum or canister is not possible. Inspections of RH TRU mixed waste in these areas occurs remotely via closed-circuit cameras a minimum of once weekly when stored waste is present. Because RH TRU mixed waste is in sealed casks, there are no additional requirements for engineered secondary containment systems. However, the floors in the RH Complex (including the RH Bay, Facility Cask Loading Room and Cask Unloading Room) are coated concrete and during normal operations (i.e., when waste is present), the floor of the RH Complex is inspected visually or by using close-circuit cameras on a weekly basis to verify that it is in good condition and free of visible cracks and gaps.

Inspections of RH TRU mixed waste containers stored in the Hot Cell and Transfer Cell are conducted using remotely operated cameras. RH TRU mixed waste in the Hot Cell is stored in either drums or canisters. The containers in the Hot Cell are inspected to ensure that they are in acceptable condition. RH TRU mixed waste in the Transfer Cell is stored in the RH-TRU 72-B cask or shielded insert; therefore, inspections in this area focus on the integrity of the cask or shielded insert. RH TRU mixed waste in the Facility Cask Loading Room is stored in the facility cask; therefore, inspections in this area focus on the integrity of the facility cask.

Inspections will be conducted in the Parking Area Unit at a frequency not less than once weekly when waste is present. These inspections are applicable to loaded Contact- Handled and Remote-Handled Packages. The perimeter fence located at the lateral limit of the Parking Area Unit, coupled with personnel access restrictions into the WHB Unit, will provide the needed security. The perimeter fence and the southern border of the WHB shall mark the lateral limit of the Parking Area Unit. Radiologically controlled areas can be established temporarily with barricades. More permanent structures can be installed. The western boundary can be established with temporary barricades since this area is within the perimeter fence. Access to radiologically controlled areas will only be permitted to personnel who have completed General Employee Radiological Training (**GERT**), a program defined by the Permittees, or escorted by personnel who have completed GERT. This program ensures that personnel have adequate knowledge to understand radiological posting they may encounter at the WIPP site. The fence of the Radiologically Controlled Area, south from the WHB airlocks, was moved to provide more maneuvering space for the trucks delivering waste. Since TRU mixed waste to be stored in the Parking Area Unit will be in sealed Contact-Handled or Remote-Handled Packages, there will be no additional requirements for engineered secondary containment systems. Inspections of the Contact-Handled and Remote-Handled Packages stored in the Parking Area Unit shall be conducted at a frequency no less than once weekly and will focus on the inventory and integrity

decontamination activities that follow a release or spill and retrieval. Radiation monitoring and sampling are mandated by DOE Orders and provide an immediate indication of a release or spill, even when they are not visibly detectable. A release or spill involving hazardous constituents (except VOCs) will also likely involve a release or spill of radioactivity, based on the processes that generated the waste and the physical form of the waste. These processes mixed the hazardous and radioactive components, as described in Table G3-1, to the extent that detection of the radioactive component can indicate the potential that the hazardous component is also present. Radiological surveys to indicate the potential for hazardous waste releases will be performed as specified in the following sections.

G3-4a TRU Mixed Waste Processing

Tables G3-2 and G3-3 specify the various steps in the process of receiving and disposing containers of CH TRU mixed waste, including RH TRU mixed waste in shielded containers and RH TRU mixed waste, respectively, where radiological surveys will be performed by the Permittees. WIPP Procedure WP 12-HP1100 provides the detailed description of methods and equipment used when performing surface contamination surveys, dose rate surveys, and large area wipes.

G3-4b TRU Mixed Waste Releases

The RCRA Contingency Plan (Permit Attachment D) specifies actions required by the Permittees in the event of spills or leaking or punctured containers of CH and RH TRU mixed waste. Following completion of decontamination efforts, the Permittees will perform hazardous material sampling to confirm the removal of hazardous waste constituents.

G3-4c Decontamination Activities at Closure

The Closure Plan (Permit Attachment G, Section G-1e(2)) specifies decontamination activities required by the Permittees at closure. Following completion of decontamination efforts, the Permittees will perform hazardous material sampling to confirm removal of hazardous waste constituents.

demonstration, and siting studies relevant to the permanent disposal of TRU wastes. Most of these wastes will be contaminated with hazardous constituents, making them mixed wastes.

The LWA addresses the disposal phase of the WIPP project, the period following closure of the site, and the removal of the surface facilities. The LWA set aside 10,240 acres (4,144 hectares) located in Eddy County, 26 miles (42 kilometers) east of Carlsbad, New Mexico, as the WIPP site. A 277-acre (112-hectare) portion within the 10,240 acres (4,144 hectares) is bounded by a barbed wire fence. This fenced area contains the surface facilities and the mined salt piles for the WIPP site. Figure H1-1 is a cutaway illustrating the spatial relationship of the surface facilities and the underground repository.

Upon receipt of the necessary certifications and permits from the EPA and the New Mexico Environment Department, the Permittees will begin disposal of contact-handled (**CH**) and remote-handled (**RH**) TRU and TRU mixed waste in the WIPP. This waste emplacement and disposal phase will continue until the regulated capacity of the repository of 6,200,000 cubic feet (175,588 cubic meters) of TRU and TRU mixed waste has been reached, and as long as the Permittees comply with the requirements of the Permit. For the purposes of this Permit Attachment, this time period is assumed to be 25 years. The waste will be shipped from DOE facilities across the country in specially designed transportation containers certified by the Nuclear Regulatory Commission. The transportation routes from these facilities to the WIPP have been predetermined. The CH TRU mixed waste will be packaged in 55-gallon (208-liter), 85-gallon (322-liter), 100-gallon (379-liter) steel drums, standard waste boxes (**SWBs**), ten drum overpacks (**TDOPs**), and/or standard large box 2s (**SLB2s**). An SWB is a steel container having a free volume of 66.3 cubic feet (1.88 cubic meters). Figure H1-2 shows the general arrangement of a seven-pack of drums and an SWB as received in a Contact-Handled Package. RH TRU mixed waste inside a Remote-Handled Package is contained in one or more of the allowable containers described in Permit Attachment A1. Some RH TRU mixed waste may arrive in shielded containers as described in Permit Attachment A1.

Upon receipt and inspection of the waste containers in the waste handling building, the containers will be moved into the repository 2,150 feet (655 meters) below the surface. The containers will then be transported to a disposal room. (See Figure H1-1 for room and panel arrangement.) The initial seven disposal rooms are in Panel 1. Panel 1 is the first of eight panels planned to be excavated. Special supports and ground control corrective actions have been implemented in Panel 1 to ensure its stability. Upon filling an entire panel, that panel will be closed to isolate it from the rest of the repository and the ventilation system. During the period of time it takes to fill a given panel, an additional panel will be excavated. Sequential excavation of Panels 2 through 8 will ensure that these individual panels remain stable during the entire time a panel is being filled with waste. Ground control maintenance and evaluation with appropriate corrective action will be required to ensure that Panels 9 and 10 (ventilation and access drifts in the repository) remain stable.

Decontamination of the WIPP facility will commence with a detailed radiation survey of the entire site. Contaminated areas and equipment will be evaluated and decontaminated in accordance with applicable requirements. Where decontamination efforts identify areas that meet clean closure standards for permitted container storage units and are below radiological release criteria, routine dismantling and salvaging practices will determine the disposition of the material or equipment involved. Material and equipment that do not meet these standards and criteria will be emplaced in the access entries (Panels 9 and/or 10). Upon completion of emplacement of the contaminated facility material, the entries will be closed and the repository