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**RENEWAL APPLICATION  
APPENDIX M1  
CONTAINER STORAGE**



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## RENEWAL APPLICATION APPENDIX M1

### CONTAINER STORAGE

#### Introduction

Management and storage of transuranic (TRU) mixed waste in the Waste Isolation Pilot Plant (WIPP) facility is subject to regulation under Title 20 of the New Mexico Administrative Code, Chapter 4, Part 1 (20.4.1 NMAC), Subpart V. The technical requirements of 20.4.1.500 NMAC (incorporating 40 CFR §§264.170 to 264.178) are applied to the operation of the Waste Handling Building Container Storage Unit (WHB Unit)(Figure M1-1), and the Parking Area Container Storage Unit (Parking Area Unit)(Figure M1-2). This Renewal Application Appendix describes the container storage units, the TRU mixed waste management facilities and operations, and compliance with the technical requirements of 20.4.1 NMAC. The configuration of the WIPP facility consists of completed structures, including all buildings and systems for the operation of the facility.

#### M1-1 Container Storage

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."

#### M1-1a Containers with Residual Liquids

The Treatment, Storage, and Disposal Facility (TSDF) Waste Acceptance Criteria (WAC) and Renewal Application Chapter B (Waste Analysis Plan) prohibit the shipment of liquid waste to the WIPP. This prohibition is enforced as a maximum residual liquids requirement. In no case shall the total liquid equal or exceed one volume percent of the waste container (e.g., drum, standard waste box ~~{SWB}~~, or canister). Since the maximum amount of liquid is one percent, calculations made to determine the secondary containment as required by 20.4.1.500 NMAC (incorporating §264.175) are based on ten percent of one percent of the volume of the containers, or one percent of the largest container, whichever is greater.

#### M1-1b Description of Containers

20.4.1.500 NMAC (incorporating 40 CFR §264.171) requires that containers holding waste be in good condition. Waste containers shall be in good condition prior to shipment from the ~~generator sites~~ TRU waste sites, i.e., containers will be of high integrity, intact, and free of surface contamination above U. S. Department of Energy (DOE) limits. The Manager of the DOE Carlsbad Field Office has the authority to suspend a TRU waste site's ~~generator's~~ certification to ship TRU mixed waste to the WIPP facility should the TRU waste site ~~generator~~ fail to meet this requirement. The containers will be certified free of surface contamination above DOE limits upon shipment. This condition shall be verified upon receipt of the waste at WIPP. The level of rigor applied in these areas to ensure container integrity and the absence of external contamination on both ends of the transportation process will ensure that waste

1 containers entering the waste management process line at WIPP meet the applicable Resource  
2 Conservation and Recovery Act (**RCRA**) requirements for container condition.

### 3 M1-1b(1) CH TRU Mixed Waste Containers

4 Contact handled (**CH**) TRU mixed waste containers will be either 55-gal (208-L) drums singly  
5 or arranged into 7-packs, 85-gal (321-L) drums singly or arranged into 4-packs, 100-gal (379 L)  
6 drums singly or arranged into 3-packs, ten-drum overpacks (**TDOP**), or SWBs. A summary  
7 description of each CH TRU mixed waste container type is provided below.

#### 8 Standard 55-Gallon Drums

9 Standard 55-gal (208-L) drums meet the requirements for U.S. Department of Transportation  
10 (**DOT**) specification 7A regulations.

11 A standard 55-gal (208-L) drum has a gross internal volume of 7.4 cubic feet (ft<sup>3</sup>) (0.210 cubic  
12 meters (m<sup>3</sup>)). Figure M1-3 shows a standard TRU mixed waste drum. One or more filtered  
13 vents (as described in Section M1-1d(1)) will be installed in the drum lid to prevent the escape of  
14 any radioactive particulates and to eliminate any potential of pressurization.

15 Standard 55-gal (208-L) drums are constructed of mild steel and may also contain rigid, molded  
16 polyethylene (or other compatible material) liners. These liners are procured to a specification  
17 describing the functional requirements of fitting inside the drum, material thickness and  
18 tolerances, and quality controls and required testing. A quality assurance surveillance program is  
19 applied to all procurements to verify that the liners meet the specification.

20 Standard 55-gal (208-L) drums may be used to collect derived waste.

#### 21 Standard Waste Boxes

22 ~~The SWBs~~ Standard Waste Boxes meet all the requirements of DOT specification 7A regulations.

23 One or more filtered vents (as described in Section M1-1d(1)) will be installed in the SWB body  
24 and located near the top of the SWB to prevent the escape of any radioactive particulates and to  
25 eliminate any potential of pressurization. They have an internal volume of 66.3 ft<sup>3</sup> (1.88 m<sup>3</sup>).  
26 Figure M1-4 shows a SWB.

27 The SWB is the largest container that may be used to collect derived waste.

#### 28 Ten-Drum Overpacks

29 The TDOP is a metal container, similar to a SWB, that meets DOT specification 7A and is  
30 certified to be noncombustible and to meet all applicable requirements for Type A packaging.  
31 The TDOP is a welded-steel, right circular cylinder, approximately 74 inches (in.) (1.9 meters  
32 (m)) high and 71 in. (1.8 m) in diameter (Figure M1-5). The maximum loaded weight of a  
33 TDOP is 6,700 pounds (lbs) (3,040 kilograms (kg)). A bolted lid on one end is removable;  
34 sealing is accomplished by clamping a neoprene gasket between the lid and the body. One or

1 more filter vents are located near the top of the TDOP on the body to prevent the escape of any  
2 radioactive particulates and to eliminate any potential of pressurization. A TDOP may contain  
3 up to ten standard 55-gal (208-L) drums or one SWB. TDOPs may be used to overpack drums  
4 or SWBs containing CH TRU mixed waste. The TDOP may also be direct loaded with CH TRU  
5 mixed waste. Figure M1-5 shows a TDOP.

#### 6 Eighty-Five Gallon Drums

7 ~~The~~ 85-gal (321-L) drums meet the requirements for DOT specification 7A regulations. One or  
8 more filtered vents (as described in Section M1-1d(1)) will be installed in the 85-gal drum to  
9 prevent the escape of any radioactive particulates and to eliminate any potential of  
10 pressurization.

11 85-gal (321-L) drums are constructed of mild steel and may also contain rigid, molded  
12 polyethylene (or other compatible material) liners. These liners are procured to a specification  
13 describing the functional requirements of fitting inside the drum, material thickness and  
14 tolerances, and quality controls and required testing. A quality assurance surveillance program is  
15 applied to all procurements to verify that the liners meet the specification.

16 ~~The~~ An 85-gal (321-L) drum, which is shown in Figure M1-6, will be used for overpacking  
17 contaminated 55-gal (208 L) drums at the WIPP facility. The 85-gal drum may also be direct  
18 loaded with CH TRU mixed waste.

19 85-gal (321-L) drums may be used to collect derived waste.

#### 20 100-Gallon Drums

21 100-gal (379-L) drums meet the requirements for DOT specification 7A regulations.

22 A 100-gal (379-L) drum has a gross internal volume of 13.4 ft<sup>3</sup> (0.38 m<sup>3</sup>). One or more filtered  
23 vents (as described in Section M1-1d(1)) will be installed in the drum lid or body to prevent the  
24 escape of any radioactive particulates and to eliminate any potential of pressurization.

25 100-gal (379-L) drums are constructed of mild steel and may also contain rigid, molded  
26 polyethylene (or other compatible material) liners. These liners are procured to a specification  
27 describing the functional requirements of fitting inside the drum, material thickness and  
28 tolerances, and quality controls and required testing. A quality assurance surveillance program is  
29 applied to all procurements to verify that the liners meet the specification.

30 100-gal (379-L) drums may be direct loaded.

#### 31 M1-1b(2) RH TRU Mixed Waste Containers

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

1 RH TRU Canisters

2 The An RH TRU Canister is a steel single shell container which is constructed to be of high  
3 integrity. An example canister is depicted in Figure M1-16a. The RH TRU Canister is vented  
4 and will have a nominal internal volume of 31.4 ft<sup>3</sup> (0.89 m<sup>3</sup>) and shall contain waste packaged in  
5 small containers (e.g., drums) or waste loaded directly into the canister.

6 Standard 55-Gallon Drums

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

12 M1-1b(3) Container Compatibility

13 All containers will be made of steel, and some will contain rigid, molded polyethylene liners.  
14 The compatibility study, documented in Renewal Application Addendum B2 of the ~~WIPP RCRA~~  
15 ~~Part B Permit Application (DOE, 1997a)~~, included container materials to assure containers are  
16 compatible with the waste. Therefore, these containers meet the requirements of 20.4.1.500  
17 NMAC (incorporating 40 CFR §264.172).

18 M1-1c Description of the Container Storage Units

19 M1-1c(1) Waste Handling Building Container Storage Unit

20 The Waste Handling Building (**WHB**) is the surface facility where TRU mixed waste handling  
21 activities will take place (Figure M1-1a). The WHB has a total area of approximately 84,000  
22 square feet (ft<sup>2</sup>) (7,804 square meters (m<sup>2</sup>)) of which 26,151 ft<sup>2</sup> (2,430 m<sup>2</sup>) are designated for the  
23 waste handling and container storage of CH TRU mixed waste and 17,403 ft<sup>2</sup> (1,617 m<sup>2</sup>) are  
24 designated for handling and storage of RH TRU mixed waste, as shown in Figures M1-1, M1-  
25 14a, and M1-17a, b, c, and d. These areas are being permitted as the WHB Unit. The concrete  
26 floors are sealed with a coating that is sufficiently impervious to the chemicals in TRU mixed  
27 waste to meet the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.175(b)(1)).  
28 Storage capacities for the WHB Unit are given in Table M1-1.

29 CH Bay Surge Storage Area

30 The Permittees will coordinate shipments with the generator/storage sites certified  
31 characterization programs in an attempt to minimize the use of surge storage. However, there  
32 may be circumstances causing shipments to arrive that would exceed the maximum capacity of  
33 the CH Bay Storage Area. The Permittees may use the CH Bay Surge Storage Area as specified  
34 ~~in Module III~~ (see Figure M1-1) only when the maximum capacities in the CH Bay Storage Area  
35 (except for the Shielded Storage Room) and the Parking Area Unit are reached and at least one  
36 of the following conditions is met:

- 1 • Surface or underground waste handling equipment malfunctions prevent the Permittees  
2 from moving waste to disposal locations;
- 3 • Hoisting or underground ventilation equipment malfunctions prevent the Permittees from  
4 moving waste into the underground;
- 5 • Power outages cause a suspension of waste emplacement activities;
- 6 • Inbound shipment delays are imminent because Parking Area Container Storage Unit  
7 Surge Storage is in use; or
- 8 • Onsite or offsite emergencies cause a suspension of waste emplacement activities.

9 The Permittees must notify NMED and those on the e-mail notification list upon using the CH  
10 Bay Surge Storage and provide justification for its use.

#### 11 CH TRU Mixed Waste

12 The ~~Contact-Handled~~ CH Packages used to transport TRU mixed waste containers will be  
13 received through one of three air-lock entries to the CH Bay of the WHB Unit. The WHB  
14 heating, ventilation and air conditioning (HVAC) system maintains the interior of the WHB at a  
15 pressure lower than the ambient atmosphere to ensure that air flows into the WHB, preventing  
16 the inadvertent release of any hazardous or radioactive constituents contamination as the result of  
17 a contamination event. The doors at each end of the air lock are interlocked to prevent both from  
18 opening simultaneously and equalizing CH Bay pressure with outside atmospheric pressure. The  
19 CH Bay houses two TRUPACT-II Docks (TRUDOCKs), each equipped with overhead cranes  
20 for opening and unloading ~~Contact-Handled~~ CH Packages. The TRUDOCKs are within ~~the~~  
21 TRUDOCK Storage Area of the WHB Unit.

22 The cranes are rated to lift the ~~Contact-Handled~~ CH Packaging lids as well as their contents. The  
23 cranes are designed to remain on their tracks and hold their load even in the event of a design-  
24 basis earthquake.

25 Upon receipt and removal of CH TRU mixed waste containers from the ~~Contact-Handled~~ CH  
26 Packaging, the waste containers are required to be in good condition (i.e., no severe rusting, no  
27 apparent structural defects, no signs of pressurization, and not leaking) as provided in Permit  
28 Module III. The waste containers will be visually inspected for physical damage (~~severe rusting,~~  
29 ~~apparent structural defects, signs of pressurization, etc.~~) and leakage to ensure they are in good  
30 condition prior to storage. Waste containers will also be checked for external surface  
31 contamination. If a primary waste container is not in good condition, the Permittees will  
32 overpack the container, repair/patch the container in accordance with 49 CFR §173 and §178  
33 (e.g., 49 CFR §173.28), or return the container to the TRU waste site generator. The Permittees  
34 may initiate local decontamination, return unacceptable containers to a DOE generator TRU  
35 waste site or send the ~~Contact-Handled~~ CH Package to the third party contractor.  
36 Decontamination activities will not be conducted on containers which are not in good condition,  
37 or which are leaking. If local decontamination activities are opted for, the work will be

1 conducted in the WHB Unit on the TRUDOCK. These processes are described in Section M1-  
2 1d. ~~The area previously designated as the Overpack and Repair Room will not be used for TRU~~  
3 ~~mixed waste management in any instances.~~

4 Once unloaded from the ~~Contact-Handled~~ CH Packaging, CH TRU mixed waste containers (7-  
5 packs, 3-packs, 4-packs, SWBs, or TDOPs) are placed in one of two positions on the facility  
6 pallet or on a containment pallet. The waste containers are stacked, on the facility pallets (one-  
7 or two-high, depending on weight considerations). Waste on containment pallets will be stacked  
8 one-high. The use of facility or containment pallets will elevate the waste at least 6 in. (15 cm)  
9 from the floor surface. Pallets of waste will then be relocated within ~~to~~ the CH Bay Storage Area  
10 of the WHB Unit for ~~normal~~ storage. ~~This~~ The CH Bay Storage Area, which is shown in Figure  
11 M1-1, will be clearly marked to indicate the lateral limits of the storage area. ~~This~~ The CH Bay  
12 Storage Area will have a maximum capacity of 13 pallets (4,160 ft<sup>3</sup> (~~{~~ 118 m<sup>3</sup> ~~}~~)) of TRU mixed  
13 waste containers during normal operations.

14 In addition, four ~~Contact-Handled~~ CH Packages, containing up to eight 7-packs, 3-packs, 4-  
15 packs, SWBs, or four TDOPs, may occupy positions at the TRUDOCKs. If waste containers are  
16 left in this area, they will be in the ~~Contact-Handled~~ CH Package with or without the shipping  
17 container lids removed. The maximum volume of waste in containers in four ~~Contact-~~  
18 ~~Handled~~ CH Packages is 640 ft<sup>3</sup> (18.1 m<sup>3</sup>).

19 The Derived Waste Storage Area of the WHB Unit is on the north wall of the CH Bay. This area  
20 will contain containers up to the volume of a SWB for collecting derived waste from all TRU  
21 mixed waste handling processes in the WHB Unit. The Derived Waste Storage Area is being  
22 permitted to allow containers in size up to a SWB to be used to accumulate derived waste. The  
23 volume of TRU mixed waste stored in this area will be up to 66.3 ft<sup>3</sup> (1.88 m<sup>3</sup>). The derived  
24 waste containers in the Derived Waste Storage Area will be stored on standard drum pallets,  
25 which are polyethylene trays with a grated deck, which will elevate the derived waste containers  
26 approximately 6 in. (15 cm) from the floor surface, and provide approximately 50 gal (190 L) of  
27 secondary containment capacity.

28 Aisle space shall be maintained in all WHB Unit TRU mixed waste storage areas. The aisle  
29 space shall be adequate to allow unobstructed movement of fire-fighting personnel, spill-control  
30 equipment, and decontamination equipment that would be used in the event of an off-normal  
31 event. An aisle space of 44 in. (1.1 m) between facility pallets will be maintained in all WHB  
32 Unit TRU mixed waste storage areas. An aisle space of 60 in. (1.5 m) will be maintained  
33 between the west wall of the CH Bay and facility pallets.

34 The WHB has been designed to meet DOE design and associated quality assurance requirements.  
35 Table M1-~~1~~ 2 summarizes basic design requirements, principal codes, and standards for the WIPP  
36 facility. ~~Appendix D2 of the WIPP RCRA Part B Permit Application (DOE, 1997a) provided~~  
37 ~~engineering design basis earthquake and tornado reports. The design basis earthquake report~~  
38 ~~provides the basis for seismic design of WIPP facility structures, including the WHB foundation.~~  
39 The WIPP design-basis earthquake is 0.1 g. The WIPP design-basis tornado includes a  
40 maximum windspeed of 183 mi per hr (mi/hr) (294.5 km/hr), which is the vector sum of all  
41 velocity components. It is also limited to a translational velocity of 41 mi/hr (66 km/hr) and a

1 tangential velocity of 124 mi/hr (200 km/hr). Other parameters are a radius of maximum wind of  
2 325 ft (99 m), a pressure drop of 0.5 lb per in.<sup>2</sup> (3.4 kilopascals [kPa]), and a rate-of-pressure  
3 drop of 0.09 lb/in.<sup>2</sup>/s (0.6 kPa/s). A design-basis flood report is not available because flooding is  
4 not a credible phenomenon at the WIPP facility. ~~Design calculations for the probable maximum~~  
5 ~~precipitation (PMP) event, provided in Appendix D7 of the WIPP RCRA Part B Permit~~  
6 ~~Application (DOE, 1997a), illustrated run-on protection for the WIPP facility. The WIPP facility~~  
7 ~~has been constructed in accordance with these applicable design bases and requirements.~~

8 The following are the major pieces of equipment that will be used to manage CH TRU mixed  
9 waste in the container storage units. A summary of equipment capacities, as required by  
10 20.4.1.500 NMAC is included in Table M1-3.

### 11 TRUPACT-II Type B Packaging

12 The TRUPACT-II (Figure M1-8a) is a double-contained cylindrical shipping container 8 ft (2.4  
13 m) in diameter and 10 ft (3 m) high. It meets Nuclear Regulatory Commission (NRC) Type B  
14 shipping container requirements and has successfully completed rigorous container-integrity  
15 tests. The payload consists of approximately 7,265 lbs (3,300 kg) gross weight in up to fourteen  
16 55-gal (208-L) drums, eight 85-gal (322-L) drums, six 100-gal (379-L) drums, two SWBs, or one  
17 TDOP.

### 18 HalfPACT Type B Packaging

19 The HalfPACT (Figure M1-8b) is a double-contained right cylindrical shipping container 7.8  
20 ft (2.4 m) in diameter and 7.6 ft (2.3 m) high. It meets NRC Type B shipping container  
21 requirements and has successfully completed rigorous container-integrity tests. The payload  
22 consists of approximately 7,600 lbs (3,500 kg) gross weight in up to seven 55-gal (208-L) drums,  
23 one SWB, or four 85-gallon drums.

### 24 Unloading Docks

25 Each TRUDOCK is designed to accommodate up to two ~~Contact-Handled~~ CH Packages. The  
26 TRUDOCK functions as a work platform, providing TRU mixed waste handling personnel easy  
27 access to the container during unloading operations (see Figure M1-1a) (~~Also see Drawing 41-~~  
28 ~~M-001-W in Appendix D3 of the WIPP RCRA Part B Permit Application (DOE, 1997a)).~~

### 29 Forklifts

30 Forklifts will be used to transfer the ~~Contact-Handled~~ CH Packages into the WHB Unit and may  
31 be used to transfer palletized CH TRU mixed waste containers to the facility transfer vehicle.  
32 Another forklift will be used for general-purpose transfer operations. This forklift has  
33 attachments and adapters to handle individual TRU mixed waste containers, if required.

34

35

1 Cranes and Adjustable Center-of-Gravity Lift Fixtures

2 At each TRUDOCK, an overhead bridge crane is used with a specially designed lift fixture for  
3 disassembly of the ~~Contact-Handled~~ CH Packages. Separate lifting attachments have been  
4 specifically designed to accommodate SWBs and TDOPs. The lift fixture, attached to the crane,  
5 has built-in level indicators and two counterweights that can be moved to adjust the center of  
6 gravity of unbalanced loads and to keep them level.

7 Facility or Containment Pallets

8 The facility pallet is a fabricated steel unit designed to support 7-packs, 4-packs, or 3-packs of  
9 drums, SWBs, or TDOPs, and has a rated load of 25,000 lbs. (11,430 kg). The facility pallet will  
10 accommodate up to four 7-packs, four 3-packs, or four 4-packs of drums or four SWBs (in two  
11 stacks of two units), two TDOPs, or any combination thereof. Loads are secured to the facility  
12 pallet during transport to the emplacement area. Facility pallets are shown in Figure M1-10.  
13 Fork pockets in the side of the pallet allow the facility pallet to be lifted and transferred by  
14 forklift to prevent direct contact between TRU mixed waste containers and forklift tines. This  
15 arrangement reduces the potential for puncture accidents. Facility pallets may also be moved by  
16 facility transfer vehicles. WIPP facility operational documents define the operational load of the  
17 facility pallet to ensure that the rated load of a facility pallet is not exceeded.

18 Containment pallets are fabricated units having a containment capacity of at least ten percent of  
19 the volume of the containers and designed to support a minimum of either a single drum, a single  
20 SWB or a single TDOP. The pallets will have a rated load capacity of equal to or greater than  
21 the gross weight limit of the container(s) to be supported on the pallet. Loads are secured to the  
22 containment pallet during transport. A typical containment pallet is shown in Figure M1-10a.  
23 Fork pockets in the side of the pallet allow the containment pallet to be lifted and transferred by  
24 forklift. WIPP facility operational documents define the operational load of the containment  
25 pallet to assure that the rated load of a containment pallet is not exceeded.

26 Facility Transfer Vehicle

27 The facility transfer vehicle is a battery or electric powered automated vehicle that either  
28 operates on tracks or has an on-board guidance system that allows the vehicle to operate on the  
29 floor of the WHB. It is designed with a flat bed that has adjustable height capability and may  
30 transfer waste payloads on facility pallets or off the facility pallet stands in the CH Bay storage  
31 area, and on and off the waste shaft conveyance by raising and lowering the bed (see Figure  
32 M1-11).

33 RH TRU Mixed Waste

34 The RH TRU mixed waste is handled and stored in the RH Complex of the WHB ~~Unit~~ which  
35 comprises the following locations: RH Bay (12,552 ft<sup>2</sup> (1,166 m<sup>2</sup>)), the Cask Unloading Room  
36 (382 ft<sup>2</sup> (36 m<sup>2</sup>)), the Hot Cell (1,841 ft<sup>2</sup> (171 m<sup>2</sup>)), the Transfer Cell (1,003 ft<sup>2</sup> (93 m<sup>2</sup>)) (Figures  
37 M1-17a, b and c), and the Facility Cask Loading Room (1,625 ft<sup>2</sup> (151 m<sup>2</sup>)) (Figure M1-17d).

1 The RH Bay (Figure M1-14a) is a high-bay area for receiving casks and subsequent handling  
2 operations. The trailer carrying the RH-TRU 72-B or CNS 10-160B shipping cask (Figures M1-  
3 18, M1-19, M1-20 and M1-21) enters the RH Bay through a set of double doors on the east side  
4 of the WHB. The RH Bay houses the Cask Transfer Car. The RH Bay is served by the RH Bay  
5 Overhead Bridge Crane used for cask handling and maintenance operations. Storage in the RH  
6 Bay occurs in the RH-TRU 72-B or CNS 10-160B casks. The storage occurs after the trailer  
7 containing the cask is moved into the RH Bay and prior to moving the cask into the Cask  
8 Unloading Room to stage the waste for disposal operations. A maximum of two loaded casks  
9 and one 55-gallon drum for derived waste ( $156 \text{ ft}^3$  ( $4.4 \text{ m}^3$ )) may be stored in the RH Bay.

10 The Cask Unloading Room (Figure M1-17a) provides for transfer of the RH-TRU 72-B cask to  
11 the Transfer Cell, or the transfer of drums from the CNS 10-160B cask to the Hot Cell. Storage  
12 in the Cask Unloading Room will occur in the RH-TRU 72-B or CNS 10-160B casks. Storage in  
13 this area typically occurs at the end of a shift or in an off-normal event that results in the  
14 suspension of waste handling operations. A maximum of one cask ( $74 \text{ ft}^3$  ( $2.1 \text{ m}^3$ )) may be  
15 stored in the Cask Unloading Room.

16 The Hot Cell (Figure M1-17b) is a concrete shielded room in which drums of RH TRU mixed  
17 waste will be transferred remotely from the CNS 10-160B cask, staged in the Hot Cell, and  
18 loaded into a Facility Canister. The loaded Facility Canister is then lowered from the Hot Cell  
19 into the Transfer Cell Shuttle Car containing a Shielded Insert. Storage in the Hot Cell occurs in  
20 either drums or Facility Canisters. Drums that are stored are either on the drum carriage unit that  
21 was removed from the CNS 10-160B cask or in a Facility Canisters. A maximum of 12 55-  
22 gallon drums and one 55-gallon drum for derived waste ( $94.9 \text{ ft}^3$  ( $2.7 \text{ m}^3$ )) may be stored in the  
23 Hot Cell.

24 The Transfer Cell (Figure M1-17c) houses the Transfer Cell Shuttle Car, which moves the RH-  
25 TRU 72-B cask or Shielded Insert into position for transferring the canister to the Facility Cask.  
26 Storage in this area typically occurs at the end of a shift or in an off-normal event that results in  
27 the suspension of a waste handling evolution. A maximum of one canister ( $31.4 \text{ ft}^3$  ( $0.89 \text{ m}^3$ ))  
28 may be stored in the Transfer Cell in the Transfer Cell Shuttle Car.

29 The Facility Cask Loading Room (Figure M1-17d) provides for transfer of a canister to the  
30 Facility Cask for subsequent transfer to the waste shaft conveyance and to the Underground  
31 Hazardous Waste Disposal Unit (**HWDU**). The Facility Cask Loading Room also functions as  
32 an air lock between the Waste Shaft and the Transfer Cell. Storage in this area typically occurs  
33 at the end of a shift or in an off-normal event that results in the suspension of waste handling  
34 operations. A maximum of one canister ( $31.4 \text{ ft}^3$  ( $0.89 \text{ m}^3$ )) may be stored in the Facility Cask  
35 (Figure M1-23) in the Facility Cask Loading Room.

36 Following is a description of major pieces of equipment that are used to manage RH TRU mixed  
37 waste in the WHB-Unit. A summary of equipment capacities, as required by 20.4.1.500 NMAC,  
38 is included in Table M1-4.

39

1 Casks

2 The RH-TRU 72-B cask (Figure M1-20) is a cylinder designed to meet ~~U.S. Department of~~  
3 ~~Transportation (DOT)~~ Type B shipping container requirements. It consists of a separate inner  
4 vessel within a stainless steel, lead-shielded outer cask protected by impact limiters at each end,  
5 made of stainless steel skins filled with polyurethane foam. The inner vessel is made of stainless  
6 steel and provides an internal containment boundary and a cavity for the payload. Neither the  
7 outer cask nor the inner vessel is vented. Payload capacity of each RH-TRU 72-B shipping cask  
8 is 8,000 lbs (3,628 kg). The payload consists of a canister of RH TRU mixed waste, which may  
9 contain up to 31.4 ft<sup>3</sup> (0.89 m<sup>3</sup>) of directly loaded waste or waste in smaller containers.

10 The CNS 10-160B cask (Figure M1-21) is designed to meet DOT Type B container requirements  
11 and consists of two carbon steel shells and a lead shield, welded to a carbon steel bottom plate.  
12 A 12-gauge stainless steel thermal shield surrounds the cask outer shell, which is equipped with  
13 two steel-encased, rigid polyurethane foam impact limiters attached to the top and bottom of the  
14 cask. The CNS 10-160B cask is not vented. Payload capacity of each CNS 10-160B cask is  
15 14,500 lbs (6,577 kg). The payload consists of up to ten 55-gallon drums.

16 Shielded Insert

17 The Shielded Insert (Figure M1-30) is specifically designed to be used in the Transfer Cell to  
18 hold and transport loaded Facility Canisters from the Hot Cell until loaded into the Facility Cask.  
19 The Shielded Insert, designed and constructed similar to the RH-TRU 72-B shipping cask, has a  
20 29 in. inside diameter with an inside length of 130.5 in. to accommodate the Facility Canister,  
21 which is 28.5 in. in diameter by 117.5 in. long. The Shielded Insert is installed on and removed  
22 from the Transfer Cell Shuttle Car in the same manner as the RH-TRU 72-B shipping cask.

23 CNS 10-160B Drum Carriage

24 The CNS 10-160B drum carriage (Figure M1-25) is a steel device used to handle drums in the  
25 CNS 10-160B cask. The drum carriages are stacked two high in the CNS 10-160B cask during  
26 shipment. They are removed from the cask using a below-the-hook lifting device termed a  
27 pentapod. The drum carriage is rated to lift up to five drums with a maximum weight of 1000  
28 pounds each.

29 RH Bay Overhead Bridge Crane

30 In the RH Bay, an overhead bridge crane is used to lift the cask from the trailer and place it on  
31 the Cask Transfer Car. It is also used to remove the impact limiters from the casks and the outer  
32 lid of the RH-TRU 72-B cask.

33 Cask Lifting Yoke

34 The lifting yoke is a lifting fixture that attaches to the RH Bay Overhead Bridge Crane and is  
35 designed to lift and rotate the RH-TRU 72-B cask onto the Cask Transfer Car.

1 Cask Transfer Cars

2 The Cask Transfer Cars (Figures M1-22a and M1-22b) are self-propelled, rail-guided vehicles;  
3 that transport casks between the RH Bay and the Cask Unloading Room.

4 6.25 Ton Grapple Hoist

5 A 6.25 Ton Grapple Hoist is used to hoist the canister from the Transfer Cell Shuttle Car into the  
6 Facility Cask.

7 Facility Canister

8 The Facility Canister is a cylindrical container designed to hold three 55-gallon drums of either  
9 RH TRU waste or dunnage (Figure M1-16).

10 Facility Cask

11 The Facility Cask body consists of two concentric steel cylinders. The annulus between the  
12 cylinders is filled with lead, and gate shield valves are located at either end. Figure M1-23  
13 provides an outline configuration of the Facility Cask. The canister is placed inside the Facility  
14 Cask for shielding during canister transfer from the RH Complex to the Underground HWDU for  
15 emplacement.

16 Facility Cask Transfer Car

17 The Facility Cask Transfer Car (Figure M1-24) is a self-propelled rail car that is used to move  
18 the Facility Cask between the Facility Cask Loading Room and the Shaft Station in the  
19 underground.

20 Hot Cell Bridge Crane

21 The Hot Cell Bridge Crane, outfitted with a rotating block and the Hot Cell Facility Grapple, will  
22 be used to lift the CNS 10-160B lid and the drum carriage units from the cask located in the Cask  
23 Unloading Room, into the Hot Cell. The Hot Cell Bridge Crane is also used to lift the empty  
24 Facility Canisters into place within the Hot Cell, move loaded drums into the Facility Canister,  
25 and lower loaded Facility Canisters into the Transfer Cell.

26 Overhead Powered Manipulator

27 The Overhead Powered Manipulator is used in the Hot Cell to lift individual drums from the  
28 drum carriage unit and lower each drum into the Facility Canister and support miscellaneous Hot  
29 Cell operations.

30

31

1 Manipulators

2 There is a maximum of two operational sets of fixed Manipulators in the Hot Cell. The  
3 Manipulators collect swipes of drums as they are being lifted from the drum carriage unit and  
4 transfer the swipes to the Shielded Material Transfer Drawer and support Hot Cell operations.

5 Shielded Material Transfer Drawer

6 The Shielded Material Transfer Drawer is used to transfer swipe samples obtained by the fixed  
7 Manipulators to the Hot Cell Gallery for radiological counting and transferring small  
8 equipment into and out of the Hot Cell.

9 Closed-Circuit Television Cameras

10 The Closed-Circuit Television Camera system is used to monitor operations throughout the Hot  
11 Cell and Transfer Cell. These cameras are used to perform inspections of waste containers and  
12 waste management areas. This camera system is operated from the shielded room in the Facility  
13 Cask Loading Room and Hot Cell Gallery. The camera system will have a video recording  
14 capability as an operational aid. This video recording capability will be available in the Transfer  
15 Cell by December 31, 2006, and in the Hot Cell prior to the initial receipt of RH TRU waste in  
16 the Hot Cell. The Transfer Cell may be used without video recording capability before  
17 December 31, 2006.

18 Transfer Cell Shuttle Car

19 The Transfer Cell Shuttle Car (Figure M1-31) positions the loaded RH-TRU 72-B cask and  
20 Shielded Insert within the Transfer Cell.

21 Cask Unloading Room Crane

22 The Cask Unloading Room Crane lifts and suspends the RH-TRU 72-B cask or Shielded Insert  
23 from the Transfer Car and lowers the cask or Shielded Insert into the Transfer Cell Shuttle Car.

24 Facility Cask Rotating Device

25 The Facility Cask Rotating Device, a floor mounted hydraulically operated structure, is designed  
26 to rotate the Facility Cask from the horizontal position to the vertical position for waste canister  
27 loading and then back to the horizontal position after the waste canister has been loaded into the  
28 Facility Cask (Figure M1-32).

29 M1-1c(2) Parking Area Container Storage Unit

30 The ~~parking area~~ **Parking Area** south of the WHB (see Figure M1-2) will be used for storage of  
31 waste containers within sealed shipping containers awaiting unloading. The area extending  
32 south from the WHB within the fenced enclosure identified as the Controlled Area on Figure  
33 M1-2 is defined as the Parking Area Unit. The Parking Area Unit provides storage space for up  
34 to 6,734 ft<sup>3</sup> (191 m<sup>3</sup>) of TRU mixed waste, contained in up to 40 loaded ~~Contact Handled~~ **CH**

1 Packages and 8 ~~Remote-Handled~~RH Packages. Secondary containment and protection of the  
2 waste containers from standing liquid are provided by the ~~Contact-Handled~~CH or ~~Remote-~~  
3 ~~Handled~~RH Packaging. Wastes placed in the Parking Area Unit will remain sealed in their  
4 ~~Contact-Handled~~CH or ~~Remote-Handled~~RH Packages, at all times while in this area.

5 The ~~Nuclear Regulatory Commission (NRC)~~ Certificate of Compliance requires that sealed  
6 ~~Contact-Handled~~CH or ~~Remote-Handled~~RH Packages which contain waste be vented every 60  
7 days to avoid unacceptable levels of internal pressure. During normal operations the maximum  
8 residence time of any one container in the Parking Area Unit is typically five days. Therefore,  
9 during normal waste handling operations, no ~~Contact-Handled~~CH or ~~Remote-Handled~~RH  
10 Packages will require venting while located in the Parking Area Unit. Any off-normal event  
11 which results in the need to store a waste container in the Parking Area Unit for a period of time  
12 approaching ~~fifty-nine (59)~~ days shall be handled in accordance with Section M1-1e(2) of this  
13 Renewal Application Appendix. Under no circumstances shall a ~~Contact-Handled~~CH or  
14 ~~Remote-Handled~~RH Package be stored in the Parking Area Unit for more than ~~fifty-nine (59)~~  
15 days after the date that the inner containment vessel of the ~~Contact-Handled~~CH or ~~Remote-~~  
16 ~~Handled~~RH Package was sealed at the TRU waste generator site. The Parking Area Unit storage  
17 capacities are listed in Table M1-5.

#### 18 Parking Area Surge Storage

19 The Permittees will coordinate shipments with the generator/storage sites certified  
20 characterization programs in an attempt to minimize the use of surge storage. However, there  
21 may be circumstances causing shipments to arrive that would exceed the maximum capacity of  
22 the Parking Area Unit. The Permittees may use the Parking Area Surge Storage ~~as specified in~~  
23 ~~Module III (see Figure M1-2)~~ only when the maximum capacity in the Parking Area Unit is  
24 reached and at least one of the following conditions is met:

- 25 • Surface or underground waste handling equipment malfunctions prevent the Permittees  
26 from moving waste to disposal locations;
- 27 • Hoisting or underground ventilation equipment malfunctions prevent the Permittees from  
28 moving waste into the underground;
- 29 • Power outages cause a suspension of waste emplacement activities;
- 30 • Inbound shipment delays are imminent because the Parking Area Unit is full (not  
31 applicable to RH TRU waste shipments); or
- 32 • Onsite or offsite emergencies cause a suspension of waste emplacement activities.

33 The Permittees must notify NMED and those on the e-mail notification list upon using the  
34 Parking Area Surge Storage and provide justification for its use.

1 M1-1d Container Management Practices

2 20.4.1.500 NMAC (incorporating 40 CFR §264.173) requires that containers be managed in a  
3 manner that does not result in spills or leaks. Containers are required to be closed at all times,  
4 unless waste is being placed in the container or removed. Because containers at the WIPP will  
5 contain radioactive waste, safety concerns require that containers be continuously vented to  
6 obviate the buildup of gases within the container. These gases could result from radiolysis,  
7 which is the breakdown of moisture by radiation. The vents, which are nominally 0.75 in. (1.9  
8 centimeters [~~1~~]) in diameter, are generally installed on or near the lids of the containers.  
9 These vents are filtered so that gas can escape while particulates are retained.

10 TRU mixed waste containers, containing off-site waste, are never opened at the WIPP facility.  
11 Derived waste containers are kept closed at all times unless waste is being added or removed.

12 Off-normal events could interrupt normal operations in the waste management process line.  
13 These off normal events fall into the following categories:

- 14 • Waste management system equipment malfunctions
- 15 • Waste shipments with unacceptable levels of surface contamination
- 16 • Hazardous Waste Manifest discrepancies that are not immediately resolved
- 17 • A suspension of emplacement activities for regulatory reasons

18 Shipments of waste from the generator TRU waste sites will be stopped as appropriate for in any  
19 events which results in an interruption to normal waste handling operations ~~that exceeds three~~  
20 ~~days~~.

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

24 M1-1d(1) Derived Waste

25 The WIPP facility operational philosophy is to introduce no new hazardous chemical  
26 components into TRU mixed waste or TRU mixed waste residues that could be present in the  
27 controlled area. This will be accomplished principally through written procedures and the use of  
28 Safe Work Permits (SWP)<sup>1</sup> and Radiological Work Permits (RWP)<sup>2</sup> which govern the activities

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1 SWPs are prepared to assure that any hazardous work (not already covered by a procedure) is performed with due precaution. SWPs are issued by the Permittees after a job supervisor completes the proper form detailing the job location, work description, personnel involved, specific hazards involved, and protective requirements. The Permittees review the form, check on the adequacy of the protective measures, and if sufficient, approve the work permit. Conditions of the SWPs must be met while any hazardous work is proceeding. Examples of activities covered by the SWP program include confined space entry, overhead work, and work on energized equipment.

2 RWPs are used to control entry into and performance of work within. Managers responsible for work within a CA must generate a work permit that specifies the work scope, limiting conditions, dosimetry, respiratory protection, protective clothing, specific worker qualifications, and radiation safety technician support. RWPs are approved by the Permittees after thorough review. No work can proceed in a CA without a valid RWP.

1 within a controlled area involving TRU mixed waste. The purpose of this operating philosophy  
2 is to avoid generating TRU mixed waste that is compositionally different than the TRU mixed  
3 waste shipped to the WIPP facility for disposal.

4 Some additional TRU mixed waste, such as used personal protective equipment, swipes, and  
5 tools, may result from decontamination operations and off-normal events. Such waste will be  
6 assumed to be contaminated with RCRA-regulated hazardous constituents in the TRU mixed  
7 waste containers from which it was derived. Derived waste may be generated as the result of  
8 decontamination activities during the waste handling process. Should decontamination activities  
9 be performed, water and a cleaning agent such as those listed in Renewal Application Chapter F  
10 (RCRA Contingency Plan) will be used. Derived waste will be considered acceptable for  
11 management at the WIPP facility, because any TRU mixed waste shipped to the facility will  
12 have already been determined to be acceptable and because no new constituents will be added.  
13 Data on the derived waste will be entered into the WWIS database. Derived waste will be  
14 contained in standard DOT ~~approved~~ Type A containers.

15 ~~The Safety Analysis Report (DOE-1997b) for packaging requires the lids of TRU mixed waste~~  
16 ~~containers to be~~ are vented through high efficiency particulate air (HEPA)-grade filters to  
17 preclude container pressurization caused by gas generation and to prevent particulate material  
18 from escaping. Filtered vents used in CH TRU mixed waste containers (55-gal (208-L) drums,  
19 85-gal (321 L) drums, 100-gal (379-L) drums, TDOPs, and SWBs) have an orifice  
20 approximately 0.375-in. (9.53-millimeters) in diameter through which internally generated gas  
21 may pass. The filter media can be any material (e.g., composite carbon, sintered metal).

22 As each derived waste container is filled, it will be closed with a lid containing a HEPA-grade  
23 filter and moved to an ~~Underground Hazardous Waste Disposal Unit (HWDU)~~ using the same  
24 equipment used for handling TRU mixed waste.

#### 25 M1-1d(2) ~~CH TRU~~ Contact-Handled Transuranic ~~Mixed Waste Handling~~

26 The CH TRU mixed waste containers will arrive by tractor-trailer at the WIPP facility in sealed  
27 shipping containers (e.g., TRUPACT-IIs or HalfPACTs) (~~see~~ Figure M1-12), at which time they  
28 will undergo security and radiological checks and shipping documentation reviews. A forklift  
29 will remove the ~~Contact-Handled~~ CH Packages and will transport them a short distance through  
30 an air lock that is designed to maintain differential pressure in the WHB. The forklift will place  
31 the shipping containers at one of the two TRUDOCKs in the TRUDOCK Storage Area of the  
32 WHB Unit, where an external survey of the ~~Contact-Handled~~ CH Package inner vessel  
33 (~~see~~ Figure M1-8a and M1-8b) will be performed as the outer containment vessel lid is lifted.  
34 The inner vessel lid will be lifted under the TRUDOCK Vent Hood System (VHS), and the  
35 contents will be surveyed during and after this lift. The TRUDOCK VHS<sup>3</sup> is attached to the

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<sup>3</sup>The TRU mixed waste container headspace may contain radiologically contaminated airborne dust particles.

1. Without the TRUDOCK VHS, a potential mechanism will exist to spread contamination (if present) in the immediate CH TRU mixed waste handling area, because lid removal will immediately expose headspace gases to prevailing air currents induced by the building ventilation system.

1 ~~Contact-Handled~~ **CH** Package to provide atmospheric control and confinement of headspace  
2 gases at their source. It also prevents potential personnel exposure and facility contamination  
3 due to the spread of radiologically contaminated airborne dust particles and minimizes personnel  
4 exposure to VOCs.

5 Contamination surveys at the WIPP facility are based in part on radiological surveys used to  
6 indicate potential releases of hazardous constituents from containers by virtue of detection of  
7 radioactive contamination (Renewal Application Appendix I3 (Radiological Surveys to Indicate  
8 Potential Hazardous Waste Releases)). Radiological surveys may be applicable to most  
9 hazardous constituent releases except the release of gaseous VOCs from TRU mixed waste  
10 containers. Radiological surveys provide the WIPP facility with a very sensitive method of  
11 indicating the potential release of nongaseous hazardous constituents through the use of surface  
12 sampling (swipes) and radioactivity counting. Radiological surveys are used in addition to the  
13 more conventional techniques such as visual inspection to identify spills.

14 Under normal operations, it is not expected that the waste containers will be externally  
15 contaminated or that removable surface contamination on the shipping package or the waste  
16 containers will be in excess of the DOE's free release limits (i.e.; < 20 disintegrations per minute  
17 (dpm)<sup>4</sup> per 100 cm<sup>2</sup> alpha or < 200 dpm per 100 cm<sup>2</sup> beta/gamma). In such a case, no further  
18 decontamination action is needed. The shipping package and waste container will be handled  
19 through the normal process. However, should the magnitude of contamination exceed the free  
20 release limits, yet still fall within the criteria for small area "spot" decontamination (i.e., less than  
21 or equal to 100 times the free release limit and less than or equal to 6 ft<sup>2</sup> [0.56 m<sup>2</sup>]), the shipping  
22 package or the waste container will be decontaminated. Decontamination activities will not be  
23 conducted on containers which are not in good condition, or containers which are leaking.  
24 Containers which are not in good condition, and containers which are leaking, will be  
25 overpacked, repaired/patched in accordance with 49 CFR §173 and §178 (e.g., 49 CFR §173.28),  
26 or returned to the TRU waste site generator. In addition, if during the waste handling process at  
27 the WIPP a waste container is breached, it will be overpacked, repaired/patched in accordance  
28 with 49 CFR §173 and §178 (e.g., 49 CFR §173.28), or returned to the TRU waste site generator.  
29 Should WIPP structures or equipment become contaminated, waste handling operations in the  
30 affected area will be immediately suspended.

31 Decontamination activities will use water and cleaning agents (~~see~~ Renewal Application  
32 Chapter F) so as to not generate any waste that cannot be considered derived waste. Items that

---

2. With the VHS, a confined and controlled set of prevailing air currents will be induced by the system blower. The TRUDOCK VHS will function as a local exhaust system to effectively control radiologically contaminated airborne dust particles (and VOCs) at essentially atmospheric pressure conditions.

Functionally, the TRUDOCK VHS will draw the TRU mixed waste container headspace gases, convey them through a HEPA filter, and ultimately duct them through the WHB exhaust ventilation system. VOCs will pass through the HEPA filter and will be conveyed to the ventilation exhaust duct system. The system principally consists of a functional aggregation of 1) vent hood assembly, 2) HEPA filter assemblies (to capture any airborne radioactive particles), 3) blower (to provide forced airflow), 4) ductwork, and 5) flexible hose.

<sup>4</sup>The unit "dpm" stands for "disintegration per minute" and is the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

1 are radiologically contaminated are also assumed to be contaminated with the hazardous wastes  
2 that are in the container involved in the spill or release. A complete listing of these waste  
3 components can be obtained from the WIPP Waste Identification ~~Information~~ **Information** System (WWIS),  
4 as described in Renewal Application Chapter B, for the purpose of characterizing derived waste.

5 It is assumed that the process of decontamination will remove the hazardous waste constituents  
6 along with the radioactive waste constituents. To provide verification of the effectiveness of the  
7 removal of hazardous waste constituents, once a contaminated surface is demonstrated to be  
8 radiologically clean, the “swipe” will be sent for analysis for hazardous constituents. The use of  
9 these confirmation analyses is as follows:

10 **For waste containers**, the analyses becomes documentation of the condition of the container at  
11 the time of emplacement. The presence of hazardous waste constituents on a container after  
12 decontamination will be at trace levels and will likely not be visible and will not pose a threat to  
13 human health or the environment. These containers will be placed in the underground without  
14 further action once the radiological contamination is removed unless there is visible evidence of  
15 hazardous waste spills or hazardous waste on the container and this contamination is considered  
16 likely to be released prior to emplacement in the underground.

17 **For area contamination**, once the area is cleaned up and is shown to be radiologically clean, it  
18 will be sampled for the presence of hazardous waste residues. If the area is large, a sampling  
19 plan will be developed which incorporates the guidance of EPA's SW-846 ([EPA, 1996](#)) in  
20 selecting random samples over large areas. Selection of constituents for sampling analysis will  
21 be based on information (in the WWIS) about the waste that was spilled and information on  
22 cleanup procedures. If the area is small, swipes will be used. If the results of the analysis show  
23 that residual contamination remains, a decision will be made whether further cleaning will be  
24 beneficial or whether final clean up shall be deferred until closure. For example, if hazardous  
25 constituents react with the floor coating and are essentially nonremovable without removing the  
26 coating, then clean up will be deferred until closure when the coatings will be stripped. In any  
27 case, appropriate notations will be entered into the operating record to assure proper  
28 consideration of formerly contaminated areas at the time of closure. Furthermore, measures such  
29 as covering, barricading, and/or placarding will be used as needed to mark areas that remain  
30 contaminated.

31 Small area decontamination, if needed, will occur in the area in which it is detected for  
32 contamination that is less than 6 ft<sup>2</sup> (0.56 m<sup>2</sup>) in area and is less than 100 times the free release  
33 limit. The free release limit is defined by DOE Orders as alpha contamination less than 20  
34 dpm/100 cm<sup>2</sup> and beta-gamma contamination less than 200 dpm/100 cm<sup>2</sup>. Overpacking would  
35 occur in the event the WIPP staff damages an otherwise intact container during handling  
36 activities. In such a case, a radiological boundary will be established, inside which all activities  
37 are carefully controlled in accordance with the protocols for the cleanup of spills or releases. A  
38 plan of recovery will be developed and executed, including overpacking the damaged container  
39 in either a 85-gal (321 L) drum, SWB, or a TDOP. The overpacked container will be properly  
40 labeled and sent underground for disposal. The area will then be decontaminated and verified to  
41 be free of contamination using both radiological and hazardous waste sampling techniques

1 (essentially, this is done with “swipes” of the surface for counting in sensitive radiation detection  
2 equipment or, if no radioactivity is present, by analysis for hazardous waste by an offsite  
3 laboratory).

4 In the event a large area contamination is discovered within a ~~Contact-Handled~~ **CH** Package  
5 during unloading, the waste will be left in the ~~Contact-Handled~~ **CH** Package and the shipping  
6 container will be resealed. The DOE considers such contamination problems the responsibility  
7 of the shipping site. Therefore, the shipper will have several options for disposition. These are  
8 as follows:

- 9
- 10 • The ~~Contact-Handled~~ **CH** Package can be returned to the shipper for decontamination and  
11 repackaging of the waste. Such waste would have to be re-approved prior to shipment to  
the WIPP.
  - 12 • Shipment to another DOE site for management in the event the original shipper does not  
13 have suitable facilities for decontamination. If the receiving site wishes to return the  
14 waste to WIPP, the site will have to meet the characterization requirements of the WAP.
  - 15 • The waste could go to a third (non-DOE) party for decontamination. In such cases, the  
16 repaired shipment would go to the original shipper and be recertified prior to shipment to  
17 the WIPP.

18 Written procedures specify materials, protocols, and steps needed to put an object into a safe  
19 configuration for decontamination of surfaces. A RWP will always be prepared prior to  
20 decontamination activities. The TRU mixed waste products from decontamination will be  
21 managed as derived waste.<sup>5</sup>

22 The TRUPACT-II may hold up to two 7-packs, two 4-packs, two 3-packs, two SWBs, or one  
23 TDOP. A HalfPACT may hold ~~one seven 55-gal (208-L) drums,~~ 7-pack, one 4-pack, one 3-  
24 pack, or one SWB, ~~or four 85-gallon drums.~~ An overhead bridge crane will be used to remove  
25 the contents of the ~~Contact-Handled~~ **CH** Package and place them on a facility pallet. The  
26 containers will be visually inspected for physical damage (severe rusting, apparent structural  
27 defects, signs of pressurization, etc.) and leakage to ensure they are in good condition prior to  
28 storage. Waste containers will also be checked for external surface contamination. If a primary  
29 waste container is not in good condition, the Permittees will overpack the container, repair/patch  
30 the container in accordance with 49 CFR §173 and §178 (e.g., 49 CFR §173.28), or return the  
31 container to the TRU waste site generator.

32 When waste is removed from the shipping package, and ~~For~~ for inventory control purposes, the  
33 TRU mixed waste container identification numbers will be verified against the information  
34 provided with the Uniform Hazardous Waste Manifest and the WWIS per Renewal Application  
35 Chapter B, Section B-5b(1). Inconsistencies will be resolved with the TRU waste site generator

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<sup>5</sup> Note that the DOE had previously proposed use of an Overpack and Repair Room to deal with major decontamination and overpacking activities. The DOE has eliminated the need for this area by: 1) limiting the size of contamination events that will be dealt with as described in this section, and 2) by performing overpacking at the point where a need for overpacking is identified instead of moving the waste to another area of the WHB. This strategy minimizes the spread of contamination.

1 before TRU mixed waste is emplaced. ~~Discrepancies that are not resolved within 15 days will be~~  
2 ~~reported to the NMED in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.72).~~

3 Each facility pallet has two recessed pockets to accommodate two sets of 7-packs, two sets of 4-  
4 packs, two sets of 3-packs, or two SWBs stacked two-high, two TDOPs, or any combination  
5 thereof. Each stack of waste containers will be secured prior to transport underground (see  
6 Figure M1-10). A forklift or the facility transfer vehicle will transport the loaded facility pallet  
7 to the conveyance loading room located adjacent to the Waste Shaft. The conveyance loading  
8 room serves as an air lock between the CH Bay and the Waste Shaft, preventing excessive air  
9 flow between the two areas. The facility transfer vehicle will be driven onto the waste shaft  
10 conveyance deck, where the loaded facility pallet will be transferred to the waste shaft  
11 conveyance, and the facility transfer vehicle will be backed off. Containers of CH TRU mixed  
12 waste (55-gal (208 L) drums, SWBs, 85-gal (321 L) drums, 100-gal (379-L) drums, and TDOPs)  
13 can be handled individually, if needed, using the forklift and lifting attachments (i.e., drum  
14 handlers, parrot beaks).

15 The waste shaft conveyance will lower the loaded facility pallet to the Underground HWDUs.  
16 Figure M1-13 is a flow diagram of the CH TRU mixed waste handling process.

#### 17 M1-1d(3) RH-TRU Remote-Handled Transuranic Mixed Waste Handling

18 The RH TRU mixed waste will be received in the RH-TRU 72-B cask or CNS 10-160B cask  
19 loaded on a trailer, as illustrated in process flow diagrams in Figures M1-26 and M1-27,  
20 respectively. These are shown schematically in Figures M1-28 and M1-29. Upon arrival at the  
21 gate, external radiological surveys, security checks, shipping documentation reviews are  
22 performed and the Uniform Hazardous Waste Manifest is signed. ~~The generator's copy of the~~  
23 ~~Uniform Hazardous Waste Manifest is returned to the generator.~~ Should the results of the  
24 contamination survey exceed acceptable levels, the shipping cask and transport trailer remain  
25 outside the WHB in the Parking Area Unit, and the appropriate radiological boundaries (i.e.,  
26 ropes, placards) are erected around the shipping cask and transport trailer. A determination will  
27 be made whether to return the cask to the originating TRU waste site or to decontaminate the  
28 cask.

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

#### 35 RH-TRU Remote-Handled Transuranic 72-B Cask Unloading

36 The Cask Transfer Car then moves the RH-TRU 72-B cask to a work stand in the RH Bay. The  
37 work stand allows access to the head area of the RH-TRU 72-B cask for conducting radiological  
38 surveys, performing physical inspections or minor maintenance, and decontamination, if  
39 necessary. The outer lid bolts on the RH-TRU 72-B cask are removed, and the outer lid is

1 removed to provide access to the lid of the cask inner containment vessel. The RH-TRU 72-B  
2 cask is moved into the Cask Unloading Room by a Cask Transfer Car and is positioned under the  
3 Cask Unloading Room Bridge Crane. The Cask Unloading Room Bridge Crane attaches to the  
4 RH-TRU 72-B cask and lifts and suspends the RH-TRU 72-B cask to clear the Cask Transfer  
5 Car. The RH-TRU 72-B cask is aligned over the Cask Unloading Room port.

6 The Cask Unloading Room shield valve is opened, and the cask is lowered through the port into  
7 the Transfer Cell Shuttle Car. The Cask Unloading Room Bridge Crane is unhooked and  
8 retracted, and the Cask Unloading Room shield valve is closed. After the cask is lowered into  
9 the Transfer Cell Shuttle Car, the bolts on the lid of the cask inner containment vessel are  
10 loosened by a robotic Manipulator. The Transfer Cell Shuttle Car is then aligned directly  
11 under the Transfer Cell shield valve in preparation for removing the inner vessel lid and  
12 transferring the canister to the Facility Cask. Operations in the Transfer Cell are monitored by  
13 closed-circuit video cameras.

14 Using the remotely-operated fixed 6.25 Ton Grapple Hoist in the Facility Cask Loading Room,  
15 the inner vessel lid is lifted clear of the RH-TRU 72-B cask, and the robotic Manipulator takes  
16 swipe samples and places them in a swipe delivery system for counting outside the Transfer Cell.  
17 If found to be contaminated above acceptable levels, the Permittees have the option to  
18 decontaminate or return the RH TRU Canister to the ~~generator/storage~~ TRU waste site or another  
19 site for remediation. If no contamination is found, the Transfer Cell Shuttle Car moves a short  
20 distance, and the inner vessel lid is lowered onto a stand on the Transfer Cell Shuttle Car. The  
21 canister is transferred to the Facility Cask as described below.

## 22 CNS 10-160B Cask Unloading

23 After the lid bolts are removed, the CNS 10-160B cask is moved using the Cask Transfer Car  
24 from the RH Bay into the Cask Unloading Room and centered beneath the Hot Cell shield plug  
25 port. The Cask Unloading Room shield door is closed, and the inner and outer Hot Cell shield  
26 plugs are removed simultaneously and set aside on the floor of the Hot Cell using the remotely  
27 operated Hot Cell Bridge Crane. The Hot Cell Bridge Crane is then lowered through the Hot  
28 Cell port and is connected to the CNS 10-160B cask lid rigging or lifting device. The Hot Cell  
29 Bridge Crane lifts the CNS 10-160B cask lid through the Hot Cell port and sets the lid aside on  
30 the Hot Cell floor.

31 Operations in the Hot Cell are monitored by closed-circuit television cameras. The drum  
32 carriage unit lifting fixture (hereafter referred to as lifting fixture) is attached to the Hot Cell  
33 Bridge Crane and lowered through the Hot Cell port. The lifting fixture is connected to the  
34 upper drum carriage unit contained in the CNS 10-160B cask. The Hot Cell Bridge Crane lifts  
35 the upper drum carriage unit from the CNS 10-160B cask through the port into the Hot Cell and  
36 sets it near the Hot Cell inspection station. The Hot Cell Bridge Crane again lowers the lifting  
37 fixture through the Hot Cell port and connects to the lower drum carriage unit. The Hot Cell  
38 Bridge Crane lifts the lower drum carriage unit from the CNS 10-160B cask through the port into  
39 the Hot Cell and sets it near the upper drum carriage unit.

1 The Hot Cell Bridge Crane lifts the CNS 10-160B cask lid from the Hot Cell floor, lowers it  
2 through the Hot Cell port and onto the top of the CNS 10-160B cask. The inner and outer Hot  
3 Cell shield plugs are replaced simultaneously. The Cask Unloading Room shield door is opened,  
4 and the CNS 10-160B cask is moved into the RH Bay using the Cask Transfer Car. The CNS  
5 10-160B cask is inspected and surveyed, the lid and impact limiter are reinstalled on the CNS  
6 10-160B cask, and it is prepared for transportation off-site.

7 The Hot Cell Bridge Crane connects to an empty Facility Canister, places it into a sleeve at the  
8 inspection station, and removes the canister lid. The Overhead Powered Manipulator or Hot Cell  
9 Crane lifts one drum from the drum carriage unit. The Hot Cell Manipulators collect swipe  
10 samples from the drum and transfer the swipes via the Transfer Drawer to the Hot Cell Gallery  
11 for counting. If the 55-gallon drums are contaminated, the Permittees may decontaminate the  
12 55-gallon drums or return them to the generator/storage TRU waste site or another site for  
13 remediation. The drum identification number is recorded, and the recorded numbers are verified  
14 against the WWIS per Renewal Application Chapter B, Section B-5b(1). ~~If there are any~~  
15 ~~discrepancies, the drum(s) in question are stored within the Hot Cell, and the generator/storage~~  
16 ~~site is contacted for resolution. Discrepancies that are not resolved within 15 days will be~~  
17 ~~reported to the NMED as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.72).~~

18 Either the Overhead Powered Manipulator or Hot Cell Bridge Crane lowers the drum into the  
19 Facility Canister. This process is repeated to place three drums in the Facility Canister. The Hot  
20 Cell Bridge Crane or powered Manipulator lifts the canister lid and places it onto the Facility  
21 Canister. The lid is locked in place using a Manipulator. Each CNS 10-160B cask shipment  
22 will contain up to ~~ten~~10 drums. Drums will be managed in sets of three. If there is a tenth drum,  
23 it will be placed in a Facility Canister or stored until WIPP receipt of the next CNS 10-160B cask  
24 shipment. The Hot Cell Bridge Crane lifts the Facility Canister and lowers it into the Transfer  
25 Cell.

26 To prepare to transfer a loaded Facility Canister from the Hot Cell to the Transfer Cell, a  
27 Shielded Insert is placed onto a Cask Transfer Car in the RH Bay. The Cask Transfer Car is then  
28 moved into the Cask Unloading Room and positioned under the Cask Unloading Room Bridge  
29 Crane. The Bridge Crane attaches to the Shielded Insert. The Cask Unloading Room Bridge  
30 Crane lifts and suspends the Shielded Insert clear of the Cask Transfer Car. The Shielded Insert  
31 is aligned over the Cask Unloading Room port. The floor valve is opened, and the Shielded  
32 Insert is lowered into the Transfer Cell Shuttle Car. The Cask Unloading Room Bridge Crane is  
33 unhooked and retracted, and the Cask Unloading Room shield valve is closed. The Shielded  
34 Insert is positioned under the Hot Cell port.

35 The Hot Cell Bridge Crane lifts a loaded, closed Facility Canister and positions it over the Hot  
36 Cell port. The Hot Cell shield valve is opened, and the crane lowers the Facility Canister  
37 through the port into the Shielded Insert positioned in the Transfer Cell Shuttle Car in the  
38 Transfer Cell. The Hot Cell Bridge Crane is disconnected from the Facility Canister and raised  
39 until the crane hook clears the Hot Cell shield valve. The Hot Cell shield valve is then closed.

40

1 Transfer of Disposal Canister into the Facility Cask

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

10 For a canisters received at the WIPP from the generator TRU waste site in a RH-TRU 72-B cask,  
11 the identification number is verified using cameras, which also provide images of the canister  
12 surfaces during the lifting operation. The identification numbers is are verified against the  
13 WWIS per Renewal Application Chapter B, Section B-5b(1). ~~If there are any discrepancies, the~~  
14 ~~canister is returned to the RH-TRU 72-B cask, returned to the Parking Area Unit, and the~~  
15 ~~generator is contacted for resolution. Discrepancies that are not resolved within 15 days will be~~  
16 ~~reported to the NMED as required by 20.4.1.500 NMAC (incorporating 40 CFR §264.72).~~ As  
17 the canister is being lifted from the RH-TRU 72-B cask into the Facility Cask, additional swipe  
18 samples may be taken.

19 Transfer of the Canister to the Underground

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

31 Returning the Empty Cask

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

1 M1-1e Inspections

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

4 M1-1e(1) WHB Unit

5 The waste containers in storage will be inspected visually or by closed-circuit television camera  
6 prior to each movement and, at a minimum, weekly, to ensure that the waste containers are in  
7 good condition and that there are no signs that a release has occurred. Waste containers will be  
8 visually inspected for physical damage (severe rusting, apparent structural defects, signs of  
9 pressurization, etc.) and leakage. If a primary waste container is not in good condition, the  
10 Permittees will overpack the container, repair/patch the container in accordance with 49 CFR  
11 §173 and §178 (e.g., 49 CFR §173.28), or return the container to the TRU waste site generator.  
12 This visual inspection of CH TRU mixed waste containers shall not include the center drums of  
13 7-packs and waste containers positioned such that visual observation is precluded due to the  
14 arrangement of waste assemblies on the facility pallets. If waste handling operations should stop  
15 for any reason with containers located at the TRUDOCK while still in the ~~Contact-Handled~~ CH  
16 Package, primary waste container inspections will not be accomplished until the containers of  
17 waste are removed from the ~~Contact-Handled~~ CH Package. If the lid to the ~~Contact-Handled~~ CH  
18 Package inner container vessel is removed, radiological checks (swipes of ~~Contact-Handled~~ CH  
19 Package inner surfaces) will be used to determine if there is contamination within the ~~Contact-~~  
20 ~~Handled~~ CH Package. Such contamination could indicate a waste container leak or spill. Using  
21 radiological surveys, a detected spill or leak of a radioactive contamination from a waste  
22 container will also be assumed to be a hazardous waste spill or release.

23 Waste containers residing within a ~~Contact-Handled~~ CH Package are not inspected, as described  
24 in the first bullet in Section M1-1e(2).

25 Waste containers will be inspected prior to reentering the waste management process line for  
26 downloading to the underground. Waste containers stored in this area will be inspected at least  
27 once weekly.

28 Loaded RH-TRU 72-B and CNS 10-160B casks will be inspected when present in the RH Bay.  
29 Physical or closed-circuit television camera inspections of the RH Complex are conducted as  
30 described in Renewal Application Chapter D, Table D-1a. Canisters loaded in an RH-TRU 72-B  
31 cask are inspected in the Transfer Cell during transfer from the cask to the Facility Cask. Waste  
32 containers received in CNS 10-160B casks are inspected in the Hot Cell during transfer from the  
33 cask to the Facility Canister by camera and/or visual inspection (through shield windows).

34 M1-1e(2) Parking Area Unit

35 Inspections will be conducted in the Parking Area Unit at a frequency not less than once weekly  
36 when waste is present. These inspections are applicable to loaded, stored ~~Contact-Handled~~ CH  
37 and ~~Remote-Handled~~ RH Packages. The perimeter fence located at the lateral limit of the  
38 Parking Area Unit, coupled with personnel access restrictions into the WHB, will provide the

1 needed security. The perimeter fence and the southern border of the WHB shall mark the lateral  
2 limit of the Parking Area Unit (Figure M1-2). Inspections of the ~~Contact-Handled~~ CH or  
3 ~~Remote-Handled~~ RH Packages stored in the Parking Area Unit will focus on the inventory and  
4 integrity of the shipping containers and the spacing between ~~Contact-Handled~~ CH and ~~Remote-~~  
5 ~~Handled~~ RH Packages. This spacing will be maintained at a minimum of four feet.

6 ~~Contact-Handled~~ CH and ~~Remote-Handled~~ RH Packages located in the Parking Area Unit will be  
7 inspected weekly during use and prior to each reuse.

8 Inspection of waste containers is not possible when the containers are in their shipping container  
9 (e.g., casks, TRUPACT-II or HalfPACTs). Inspections can be accomplished by bringing the  
10 shipping containers into the WHB Unit and opening them and lifting the waste containers out for  
11 inspection. The DOE, however, believes that removing containers strictly for the purposes of  
12 inspection results in unnecessary worker exposures and subjects the waste to additional handling.  
13 The DOE has proposed that waste containers need not be inspected at all until they are ready to  
14 be removed from the shipping container for emplacement underground. Because shipping  
15 containers are sealed and are of robust design, no harm can come to the waste while in the  
16 shipping containers and the waste cannot leak or otherwise be released to the environment.  
17 ~~Contact-Handled~~ CH or ~~Remote-Handled~~ RH Packages shall be opened every 60 days for the  
18 purposes of venting, so that the longest waste would be uninspected would be for 60 days from  
19 the date that the inner containment vessel of the ~~Contact-Handled~~ CH or ~~Remote-Handled~~ RH  
20 Package was closed at the ~~generator~~ TRU waste site. Venting the ~~Contact-Handled~~ CH or  
21 ~~Remote-Handled~~ RH Packages involves removing the outer lid and installing a tool in the port of  
22 the inner lid.

23 The following strategy will be used for inspecting waste containers that will be retained within  
24 their shipping containers for an extended period of time:

- 25 • If the reason for retaining the TRU mixed waste containers in the shipping container is  
26 due to an unresolved manifest discrepancy, the DOE will return the shipment to the TRU  
27 waste site ~~generator~~ prior to the expiration of the 60 day NRC venting period or within 30  
28 days after receipt at the WIPP, whichever comes sooner. In this case, no inspections of  
29 the internal containers will be performed. The stored ~~Contact-Handled~~ CH or ~~Remote-~~  
30 ~~Handled~~ RH Package will be inspected weekly as described above.
- 31 • If the reason for retaining the TRU mixed waste containers in the ~~Contact-Handled~~ CH or  
32 ~~Remote-Handled~~ RH Package is due to an equipment malfunction that prevents unloading  
33 the waste in the WHB Unit, the DOE will return the shipment to the TRU waste site  
34 ~~generator~~ prior to the expiration of the 60 day NRC venting period. In this case, the DOE  
35 would have to ship the TRU mixed waste containers back with sufficient time for the  
36 TRU waste site ~~generator~~ to vent the shipment within the 60 day limit. In this case, no  
37 inspections of the internal containers will be performed. The stored ~~Contact-Handled~~ CH  
38 or ~~Remote-Handled~~ RH Package will be inspected weekly as described above.
- 39 • If the reason for retaining the TRU mixed waste containers is due to an equipment  
40 malfunction that prevents the timely movement of the waste containers into the

1 underground, the waste containers will be kept in the ~~Contact-Handled~~ **CH** or ~~Remote-~~  
2 ~~Handled~~ **RH** Package until day 30 (after receipt at the WIPP) or the expiration of the 60  
3 day limit, whichever comes sooner. At that time the ~~Contact-Handled~~ **CH** or ~~Remote-~~  
4 ~~Handled~~ **RH** Package will be moved into the WHB. ~~Contact-Handled~~ **CH** TRU mixed  
5 waste containers will be removed and placed in one of the permitted storage areas in the  
6 WHB Unit. The ~~Remote-Handled~~ **RH** Package will be vented, however, the containers  
7 will not be removed from the shipping package. If there is no additional space within the  
8 permitted storage areas of the WHB Unit, the DOE will discuss an emergency permit  
9 with the NMED for the purposes of storing the waste elsewhere in the WHB Unit. Waste  
10 containers will be inspected when removed from the ~~Contact-Handled~~ **CH** Packaging and  
11 weekly while in storage in the WHB Unit. ~~Contact-Handled~~ **CH** or ~~Remote-Handled~~ **RH**  
12 Packages will be inspected weekly while they contain TRU mixed waste containers as  
13 discussed above.

14 The DOE believes that this strategy minimizes both the amount of shipping that is necessary and  
15 the amount of waste handling, while maintaining a reasonable inspection schedule. The DOE  
16 will stop shipments of waste for any equipment outage **as appropriate** ~~that will extend beyond~~  
17 ~~three days~~.

#### 18 M1-1f Containment

19 The WHB Unit has concrete floors, which are sealed with a coating that is designed to resist all  
20 but the strongest oxidizing agents. Such oxidizing agents do not meet the TSDF-WAC and will  
21 not be accepted in TRU mixed waste at the WIPP facility. Therefore, TRU mixed wastes pose  
22 no compatibility problems with respect to the WHB Unit floor. The floor coating consists of  
23 Carboline® 1340 clear primer-sealer on top of prepared concrete, Carboline® 191 primer  
24 epoxy, and Carboline® 195 surface epoxy. The manufacturer's chemical resistance guide  
25 shows "Very Good" for acids and "Excellent" for alkalis, solvents, salt, and water. Uses are  
26 indicated for nuclear power plants, industrial equipment and components, chemical processing  
27 plants, and pulp and paper mills for protection of structural steel and concrete. During the  
28 Disposal Phase, should the floors need to be re-coated, any floor coating used in the WHB Unit  
29 TRU mixed waste handling areas will be compatible with the TRU mixed waste constituents and  
30 will have chemical resistance at least equivalent to the Carboline® products. Figure M1-1  
31 shows where TRU mixed waste handling activities discussed in this section occur.

32 During normal operations, the floor of the storage areas within the WHB Unit shall be visually  
33 inspected on a weekly basis to verify that it is in good condition and free of obvious cracks and  
34 gaps. Floor areas of the WHB Unit in use during off-normal events will be inspected prior to use  
35 and weekly thereafter. All TRU mixed waste containers located in the permitted storage areas  
36 shall be elevated at least 6 in. (15 cm) from the surface of the floor. TRU mixed waste  
37 containers that have been removed from ~~Contact-Handled~~ **CH** or ~~Remote-Handled~~ **RH** Packaging  
38 shall be stored at a designated storage area inside the WHB Unit so as to preclude exposure to  
39 the elements.

40 Secondary containment at the CH Bay Storage Area inside the WHB Unit shall be provided by  
41 the WHB Unit floor (See-Figure M1-1). The WHB Unit is engineered such that during normal

1 operations, the floor capacity is sufficient to contain liquids upon release. Secondary  
2 Containment at the Derived Waste Storage Area of the WHB Unit will be provided by a  
3 polyethylene standard drum pallet. The Parking Area Unit and TRUDOCK Storage Area of the  
4 WHB Unit require no engineered secondary containment since no waste is to be stored there  
5 unless it is protected by the ~~Contact-Handled~~ **CH** or ~~Remote-Handled~~ **RH** Packaging.

6 Calculations to determine the floor surface area required to provide secondary containment in the  
7 event of a release are based on the maximum quantity of liquid which could be present within ten  
8 percent of one percent of the volume of all the containers or one percent of the capacity of the  
9 largest single container, whichever is greater.

10 Secondary containment at storage locations inside the RH Bay and Cask Unloading Room is  
11 provided by the cask. Secondary containment at storage locations inside the Transfer Cell is  
12 provided by the RH-TRU 72-B cask or Shielded Insert. Secondary containment at storage  
13 locations in the Facility Cask Loading Room is provided by the Facility Cask. In the Hot Cell,  
14 waste containers are stored in either the drum carriage unit or in canister sleeves. The Lower Hot  
15 Cell provides secondary containment as described in Section M1-f(2). In addition, the RH Bay,  
16 Hot Cell, and Transfer Cell contain 220-gallon (833-L) (Hot Cell), 11,400-gallon (43,152-L)  
17 (RH Bay), and 220-gallon (833-L) (Transfer Cell) sumps, respectively, to collect any liquids.

#### 18 M1-1f(1) Secondary Containment Requirements for the WHB Unit

19 The maximum volume of TRU mixed waste on facility pallets that will be stored in the CH Bay  
20 Storage and Surge Storage Areas of the WHB is 18 facility pallets @ 2 TDOPs per pallet = 36  
21 TDOPs of waste. 36 TDOPs @ 1,200 gal (4,540 L) per TDOP = 43,200 gal (163,440L) waste  
22 container capacity. 43,200 gal (163,440 L) x ten percent of the total volume = 4,320 gal (16,344  
23 L) of waste. Since 4,320 gal (16,344 L) is greater than 1,200 gal (4,540 L), the configuration of  
24 possible TDOPs in the storage area is used for the calculation of secondary containment  
25 requirements. 4,320 gal (16,344 L) of liquid x one percent liquids = 43.2 gal (163.4 L) of liquid  
26 for which secondary containment is needed.

27 The maximum volume of TRU mixed waste that will be stored in the Derived Waste Storage  
28 Area of the WHB Unit is one SWB. 1 SWBs @ 496 gal (1,878 L) per SWB = 496 gal (1,878 L)  
29 waste container capacity. Since the maximum storage volume of 496 gal (1,878 L) is equal to  
30 the volume of the largest single container, the volume of the a single SWB is used for the  
31 calculation of secondary containment requirements. 496 gal (1,878 L) of liquid x one percent  
32 liquids = 4.96 gal (18.8 L) of liquid for which secondary containment is needed.

33 The maximum volume of TRU mixed waste that will be stored in the Hot Cell is 13 RH TRU  
34 drums @ 55 gal (210 L) per drum = 715 (2,730 L) of waste in drums. 715 gal (2,730 L) of waste  
35 x ten percent of total volume = 71.5 gal (273 L) of waste. Secondary containment for liquids  
36 will need to have a capacity of 71.5 gal (273 L). Since 71.5 gal (273 L) is less than the volume  
37 of the single container of 235 gal (890 L) therefore, the larger volume is used for determining the  
38 secondary containment requirements. 235 gal (890 L) of waste x one percent liquids = 2.35 gal  
39 (8.9 L) of liquid needed for secondary containment.

1 The maximum volume of TRU mixed waste that will be stored in the Transfer Cell is one RH-  
2 TRU 72-B Canister or one Facility Canister @ 235 gal (890 L) per canister x ten percent of total  
3 volume = 23.5 gal (8.90 L) of waste. Since 23.5 gal (8.90 L) is less than the volume of the single  
4 container of 235 gal (890 L) therefore, the larger volume is used for determining the secondary  
5 containment requirements. 235 gal (890 L) of waste x one percent liquids = 2.35 gal (8.9 L) of  
6 liquid needed for secondary containment.

7 M1-1f(2) Secondary Containment Description

8 The following is a calculation of the surface area the quantities of liquid would cover. Using a  
9 conversion factor of 0.1337 ft<sup>3</sup>/gal (0.001 m<sup>3</sup>/L) and assuming the spill is 0.0033 ft (0.001 m)  
10 thick, the following calculation can be used:

11 gallons x cubic feet per gallon ÷ thickness in feet = area covered in square feet

12 CH Bay Storage Area

13 43.2 gal x 0.1337 ft<sup>3</sup>/gal ÷ 0.0033 ft = 1,750 ft<sup>2</sup> (162.7 m<sup>2</sup>)

14 Hot Cell

15 2.35 gal x 0.1337 ft<sup>3</sup>/gal ÷ 0.0033 ft = 95 ft<sup>2</sup> (8.8 m<sup>2</sup>)

16 Transfer Cell

17 2.35 gal x 0.1337 ft<sup>3</sup>/gal ÷ 0.0033 ft = 95 ft<sup>2</sup> (8.8 m<sup>2</sup>)

18 The WHB Unit has 33,175 ft<sup>2</sup> (3,082 m<sup>2</sup>) of floor space, the CH Bay Storage Area has 26,151 ft<sup>2</sup>  
19 (2,430 m<sup>2</sup>) of floor space. The CH Bay Storage Area requires 1,750 ft<sup>2</sup> (162.7 m<sup>2</sup>) for  
20 containment, Thus, the floor area of the CH Bay Storage Area of the WHB Unit provide  
21 sufficient secondary containment to contain a release of ten percent of one percent of the volume  
22 of all of the containers, or one percent of the capacity of the largest container, whichever is  
23 greater.

24 The Hot Cell and Transfer Cell are the only portions of the RH Complex managing RH TRU  
25 mixed waste outside of casks or canisters. The Hot Cell has 1,841 ft<sup>2</sup> (171 m<sup>2</sup>) of floor space and  
26 the Transfer Cell has 1,003 ft<sup>2</sup> (93 m<sup>2</sup>) of floor space. The Hot Cell and Transfer Cell require  
27 only 95 ft<sup>2</sup> for containment, therefore there is sufficient floor space to contain a release of ten  
28 percent of one percent of containers in these storage areas.

29 In addition, both the Hot Cell and the Transfer Cell each contain a 220 gal (833 L) sump that will  
30 collect any liquids that spill from containers.

31 Derived Waste Storage Area

32 The derived waste containers in the Derived Waste Storage Area will be stored on standard drum  
33 pallets, which provides approximately 50 gal (190 L) of secondary containment capacity. Thus

1 the secondary containment capacity of the standard drum pallet is sufficient to contain a release  
2 of ten percent of one percent of the largest container (4.96 gal or 18.8 L).

3 Parking Area Unit

4 Containers of TRU mixed waste to be stored in the Parking Area Unit will be in ~~Contact-~~  
5 ~~Handled~~ **CH** or ~~Remote-Handled~~ **RH** Packages. There will be no additional requirements for  
6 engineered secondary containment systems.

7 M1-1g Special Requirements for Ignitable, Reactive, and Incompatible Waste

8 Special requirements for ignitable, reactive, and incompatible waste are addressed in 20.4.1.500  
9 NMAC (incorporating 40 CFR §§264.176 and 264.177). Renewal Application Chapter B, Waste  
10 Analysis Plan, precludes ignitable, reactive, or incompatible waste at the WIPP. No additional  
11 measures are required.

12 M1-1h Closure

13 Clean closure is planned in accordance with 20.4.1.500 NMAC (incorporating 40 CFR  
14 §264.178) for all permitted container storage areas. The applicable areas and the plans for clean  
15 closure are detailed in Renewal Application Chapter I.

16 M1-1i Control of Run On

17 The WHB Unit is located indoors which prevents run-on from a precipitation event. In addition,  
18 the CH TRU containers are stored on facility pallets, containment pallets, or standard drum  
19 pallets, which elevate the CH TRU mixed waste containers at least 6 in. (15 cm) off the floor, or  
20 in ~~Contact-Handled~~ **CH** or ~~Remote-Handled~~ **RH** Packages, so that any firewater released in the  
21 building will not pool around containers. Within the RH Bay, Cask Unloading Room, Transfer  
22 Cell, and Facility Cask Loading Room, waste containers are stored in casks or Shielded Inserts  
23 and protected from any potential run on. Any firewater released in the building will not pool  
24 around the waste containers as they are stored in casks, or Shielded Inserts. Within the Hot Cell,  
25 there is no source of water during operations. However, control of run-on is provided by the  
26 Lower Hot Cell, which lies below a sloped floor surrounded by a grating and canister sleeves in  
27 the Hot Cell above.

28 In the Parking Area Unit, the containers of TRU mixed waste are always in ~~Contact-Handled~~ **CH**  
29 or ~~Remote-Handled~~ **RH** Packages which protect them from precipitation and run on. Therefore,  
30 the WIPP container storage units will comply with the requirements of 20.4.1.500 NMAC  
31 (incorporating 40 CFR §264.175(b)(4)).

- 1 **References**
- 2 ~~DOE, 1997a. Resource Conservation and Recovery Act Part B Permit Application, Waste~~
- 3 ~~Isolation Pilot Plant (WIPP), Carlsbad, New Mexico, Rev. 6.5, 1997.~~
- 4 ~~DOE, 1997b. Waste Isolation Pilot Plant Safety Analysis Report (DOE/WIPP 95-2065, Rev. 1),~~
- 5 ~~U.S. Department of Energy, Carlsbad Area Office, Carlsbad, NM, April 1997.~~

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**TABLES**

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**TABLE M1-1**  
**RH TRU MIXED WASTE HANDLING EQUIPMENT CAPACITIES**

<u>Description</u>	<u>Area</u>	<u>Maximum Capacity</u>	<u>Container Equivalent</u>
<u>CH Bay Storage Area</u>	<u>26,151 ft<sup>2</sup></u> <u>(2,430 m<sup>2</sup>)</u>	<u>4,800 ft<sup>3</sup></u> <u>(135.9 m<sup>3</sup>)</u>	<u>13 loaded facility pallets and 4 CH Packages at the TRUDOCKS</u>
<u>CH Bay Surge Storage Area</u>	<u>included in CH Bay Storage Area</u>	<u>1,600 ft<sup>3</sup></u> <u>(45.3 m<sup>3</sup>)</u>	<u>5 loaded facility pallets</u>
<u>Derived Waste Storage Area</u>	<u>included in CH Bay Storage Area</u>	<u>66.3 ft<sup>3</sup></u> <u>(1.88 m<sup>3</sup>)</u>	<u>1 Standard Waste Box</u>
<b><u>Total for CH Waste</u></b>	<b><u>26,151 ft<sup>2</sup></u></b> <b><u>(2,430 m<sup>2</sup>)</u></b>	<b><u>6,466.3 ft<sup>3</sup></u></b> <b><u>(183.1 m<sup>3</sup>)</u></b>	
<u>RH Bay</u>	<u>12,552 ft<sup>2</sup></u> <u>(1,166 m<sup>2</sup>)</u>	<u>156 ft<sup>3</sup></u> <u>(4.4 m<sup>3</sup>)</u>	<u>2 loaded casks and 1 drum of derived waste</u>
<u>Cask Unloading Room</u>	<u>382 ft<sup>2</sup></u> <u>(36 m<sup>2</sup>)</u>	<u>74 ft<sup>3</sup></u> <u>(2.1 m<sup>3</sup>)</u>	<u>1 loaded cask</u>
<u>Hot Cell</u>	<u>1,841 ft<sup>2</sup></u> <u>(171 m<sup>2</sup>)</u>	<u>94.9 ft<sup>3</sup></u> <u>(2.7 m<sup>3</sup>)</u>	<u>12 drums and 1 drum of derived waste</u>
<u>Transfer Cell</u>	<u>1,003 ft<sup>2</sup></u> <u>(93 m<sup>2</sup>)</u>	<u>31.4 ft<sup>3</sup></u> <u>(0.89 m<sup>3</sup>)</u>	<u>1 canister</u>
<u>Facility Cask Loading Room</u>	<u>1,625 ft<sup>2</sup></u> <u>(151 m<sup>2</sup>)</u>	<u>31.4 ft<sup>3</sup></u> <u>(0.89 m<sup>3</sup>)</u>	<u>1 canister</u>
<b><u>Total for RH Waste</u></b>	<b><u>17,403 ft<sup>2</sup></u></b> <b><u>(1,617 m<sup>2</sup>)</u></b>	<b><u>387.7 ft<sup>3</sup></u></b> <b><u>(11.0 m<sup>3</sup>)</u></b>	<u>—</u>
<b><u>Facility Total</u></b>	<b><u>43,554 ft<sup>2</sup></u></b> <b><u>(4,047 m<sup>2</sup>)</u></b>	<b><u>6,854 ft<sup>3</sup></u></b> <b><u>(194.1 m<sup>3</sup>)</u></b>	<u>—</u>

**TABLE M1-12**  
**BASIC DESIGN REQUIREMENTS, PRINCIPAL CODES, AND STANDARDS**

	Structure/Supports			Liquid and Process Air Handling Processing and Storage Equipment							Air Hdlg Ducting & Fans	HVAC Filters		Mechanical Handling Equipment			Instrumentation and Electrical			Quality Assurance Program	
	DBE DBT ACI-318 AISC	ANSI A58.1	Site-Specific Requirements	Vessel ASME VIII NFPA <sup>e</sup>	Piping & Valves ANSI BBB,1 NFPA <sup>e</sup> UP		Pumps API-610 NFPA <sup>e</sup>	Storage Tanks API-650 or API-620	Heat Exchgrs ASME VIII TEMA	All Other Equipment MFRs STD	ARI SMACNA AMCA	Pre-Filters ASHRAE 52.68	HEPA Filters MIL F 51068C ANSI N 509 ANSI N 510	Crane and Related Equipment CMAA	CMAA AISC AWS	All Other Equipment MFRs STD	A-NE	ANSI SODS or NAT'L Electrical Code	IA/ MFRs STD	ANSI/ASME NQA-1 and Supplements	Com. and Industry Practices
Design Class I	X		a	X <sup>f</sup>			X	X	X		X <sup>c</sup>	X <sup>c,d</sup>	X <sup>c</sup>	X	X		X	X		X	
Design Class II	a,b	X	a	X	X		X	X	X		X <sup>c</sup>	X <sup>c</sup>	X <sup>c</sup>	X	X			X	X	X	
Design Class IIIA	a	X	a	a	X		a			X	X <sup>c</sup>	X <sup>c</sup>	X <sup>c</sup>	a	a	X		X	X	X	
Design Class III		X	g		a	X				X	X	X				X		X			X

X – Minimum Requirements

a-Requirements to be determined on a case-by-case basis.

b-Required for structure and supports needed for confinement and control of radioactivity.

c-Except structures and supports that are designed to withstand a design-basis earthquake (DBE)/design-basis tornado (DBT) when specified in column 1 of this table.

d-Underwriter's Laboratory (UL) Class I Listed.

e-For fire protection systems.

f-American Society for Mechanical Engineers (ASME) III for other Class I vessels.

g-Design of underground structures, mining equipment, and facilities are basically governed by the MSHA and experience in local mines.

ACI = American Concrete Institute	CMAA = Crane Manufacturers Association	MIL = Military (specification)
AISC = American Institute of Steel Construction	DBE = Design-basis earthquake	MSHA = Mine Safety and Health Administration
AMCA = Air Moving and Conditioning Association	DBT = Design-basis tornado	NFPA = National Fire Protection Association
API = American Petroleum Institute	HEPA = High-efficiency particulate air	NQA = Nuclear Quality Assurance (Standard)
ARI = Air Conditioning and Refrigeration Institute	HVAC = Heating, Ventilation, and Air-Conditioning	SMACNA = Sheet Metal and Air Conditioning Contractors National Association, Inc.
ASHRAE = American Society of Heating, Refrigeration, and Air Conditioning Engineers, Inc.	A = Institute of Electronics and Electronic Engineers	STD = Standard
AWS = American Welding Society	IA = Instrument Society of America	TEMA = Tubular Exchanger Manufacturers Association
	MFR = Manufacturer	UP = Uniform Plumbing Code

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**TABLE M1-23**  
**WASTE HANDLING EQUIPMENT CAPACITIES**

<b>CAPACITIES FOR EQUIPMENT</b>	
CH Bay overhead bridge crane	12,000 lbs.
CH Bay forklifts	26,000 lbs.
Facility Pallet	25,000 lbs.
Adjustable center-of-gravity lift fixture	10,000 lbs.
Facility Transfer Vehicle	30,000 lbs.
<b>MAXIMUM GROSS WEIGHTS OF CONTAINERS</b>	
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.
<b>MAXIMUM NET EMPTY WEIGHTS OF EQUIPMENT</b>	
TRUPACT-II	13,140 lbs.
HalfPACT	10,500 lbs.
Adjustable center of gravity lift fixture	2,500 lbs.
Facility pallet	4,120 lbs.

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**TABLE M1-34**  
**RH TRU MIXED WASTE HANDLING EQUIPMENT CAPACITIES**

<b>CAPACITIES FOR EQUIPMENT</b>	
RH Bay Overhead Bridge Crane	140 tons main hoist 25 tons auxiliary hoist
RH-TRU 72-B Cask Transfer Car	20 tons
CNS 10-160B Cask Transfer Car	35 tons
Transfer Cell Shuttle Car	29 tons
Hot Cell Bridge Crane	15 tons
Overhead Powered Manipulator	2.5 tons
Facility Cask Rotating Device	No specific load rating
Cask Unloading Room Crane	25 tons
6.25 Ton Grapple Hoist	6.25 tons
Facility Cask Transfer Car	40 tons
<b>MAXIMUM GROSS WEIGHTS OF RH TRU CONTAINERS</b>	
RH TRU Canister	8,000 lbs
55-Gallon Drum	1,000 lbs
Facility Canister	10,000 lbs
<b>MAXIMUM NET EMPTY WEIGHTS OF EQUIPMENT</b>	
RH-TRU 72-B Cask	37,000 lbs
CNS 10-160B Cask	57,500 lbs
Facility Cask	67,700 lbs
Shielded Insert	26,300 lbs

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**Table M1-5**  
**PARKING AREA UNIT STORAGE CAPACITIES**

<b><u>Description</u></b>	<b><u>Area</u></b>	<b><u>Maximum Capacity</u></b>	<b><u>Container Equivalent</u></b>
<b><u>Parking Area</u></b>	<b><u>137,050 ft<sup>2</sup></u></b> <b><u>(12,730 m<sup>2</sup>)</u></b>	<b><u>6,734 ft<sup>3</sup></u></b> <b><u>(191 m<sup>3</sup>)</u></b>	<b><u>40 Contact-Handled Packages containing waste and 8 Remote-Handled Packages containing waste. The total number of Contact-Handled Packages containing waste in the Parking Area Unit cannot exceed 50.</u></b>
<b><u>Parking Area Surge Storage</u></b>	<b><u>included in Parking Area</u></b>	<b><u>2,129 ft<sup>3</sup></u></b> <b><u>(60 m<sup>3</sup>)</u></b>	<b><u>12 Contact-Handled Packages and 4 Remote-Handled Packages. The total number of Contact-Handled Packages containing waste in the Parking Area Unit cannot exceed 50.</u></b>

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**FIGURES**

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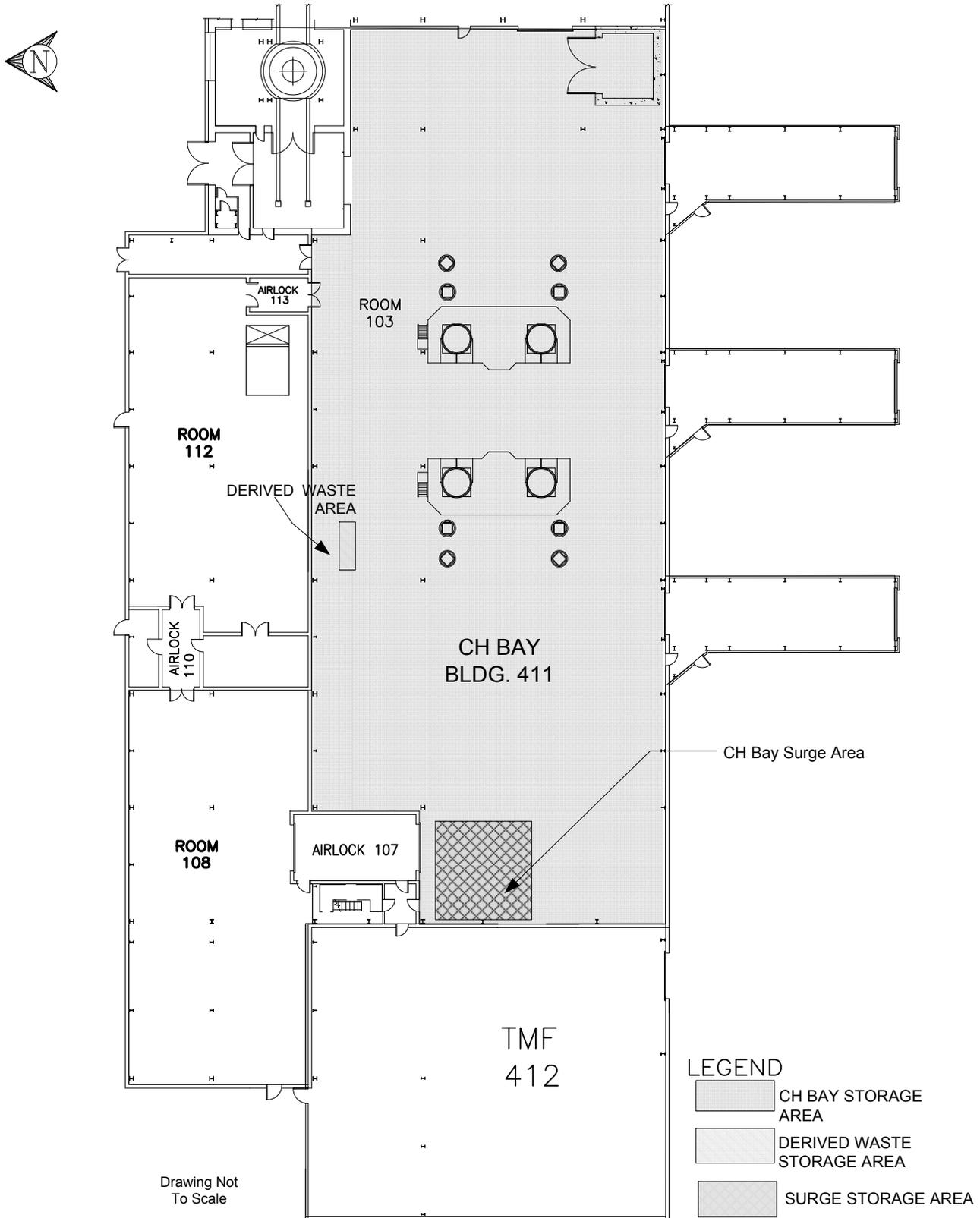
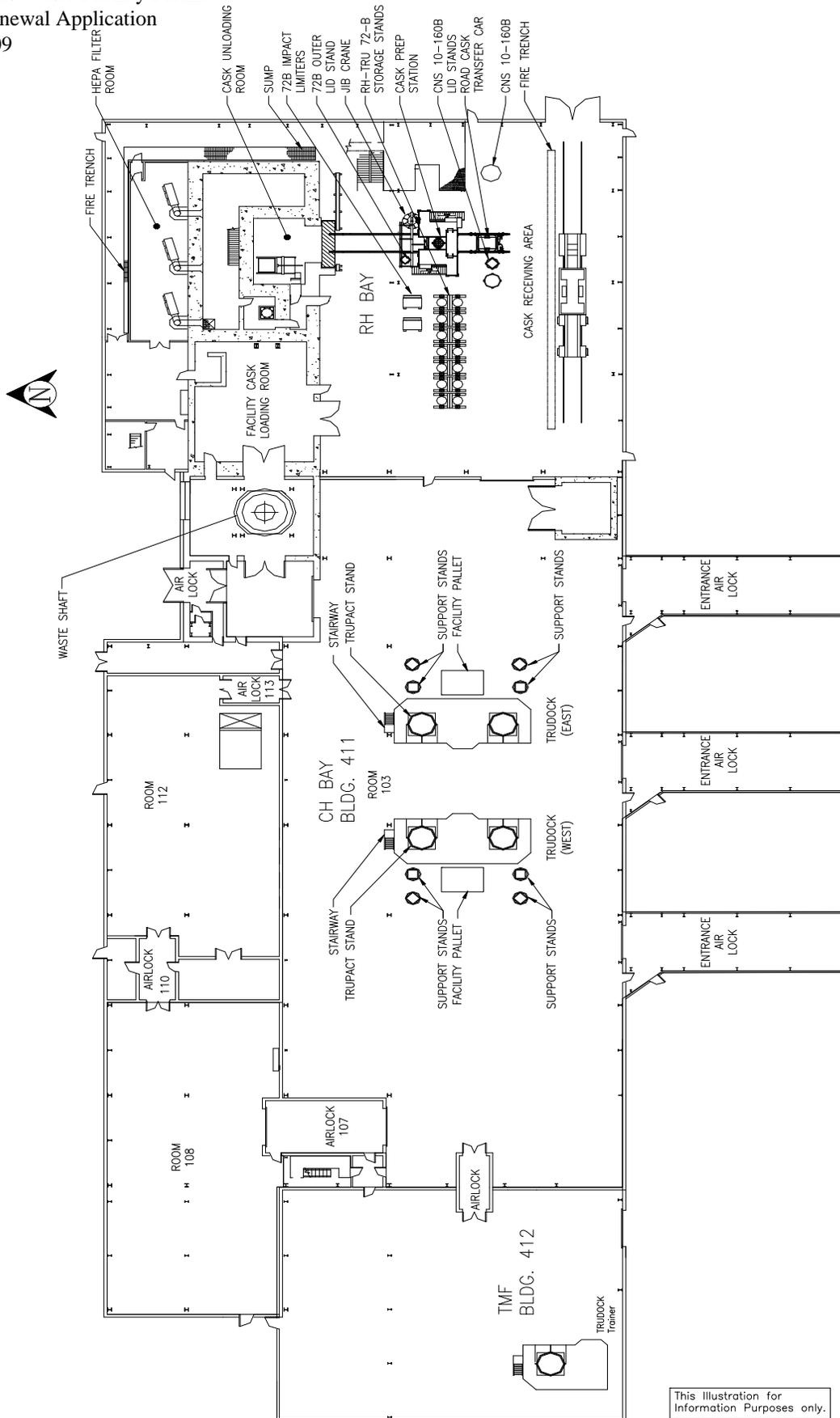


Figure M1-1  
Waste Handling Building - CH TRU Mixed Waste Container Storage and Surge Areas



This illustration for Information Purposes only.

Figure M1-1a  
 Waste Handling Building Plan (Ground Floor)  
 RENEWAL APPLICATION APPENDIX M1  
 Page M1-42 of 79

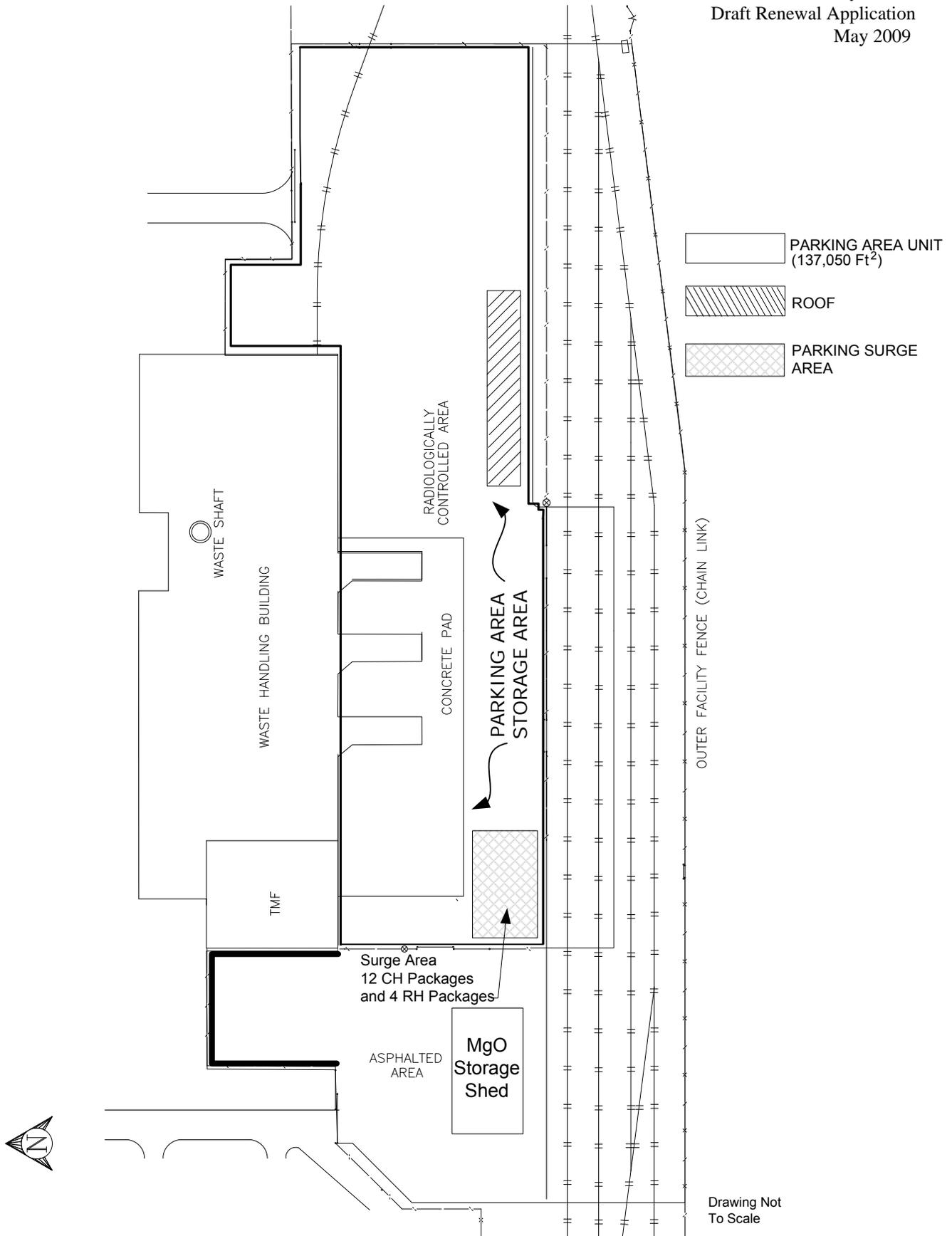


Figure M1-2  
 Parking Area - Container Storage and Surge Areas

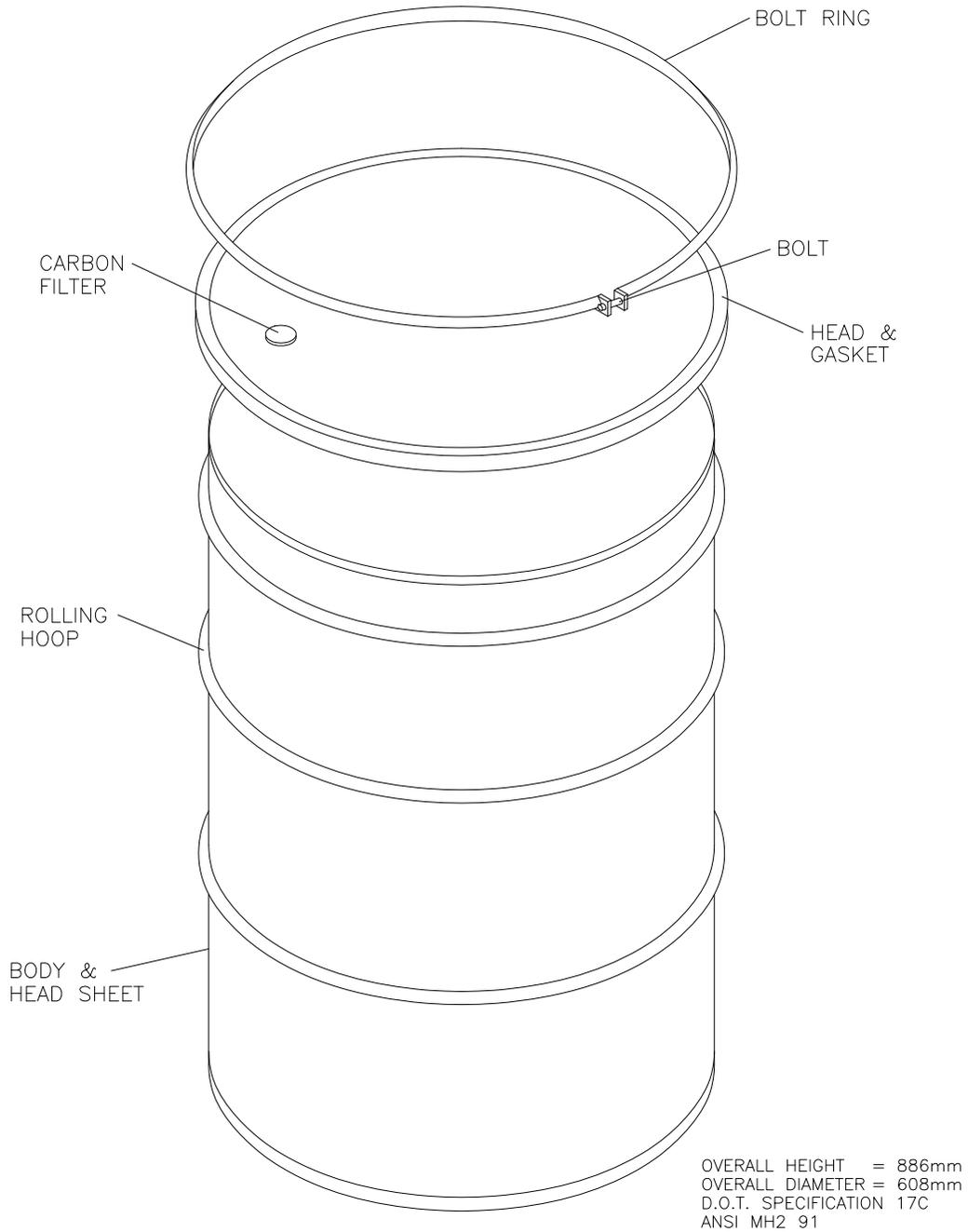


Figure M1-3  
Standard 55-Gallon Drum (Typical)

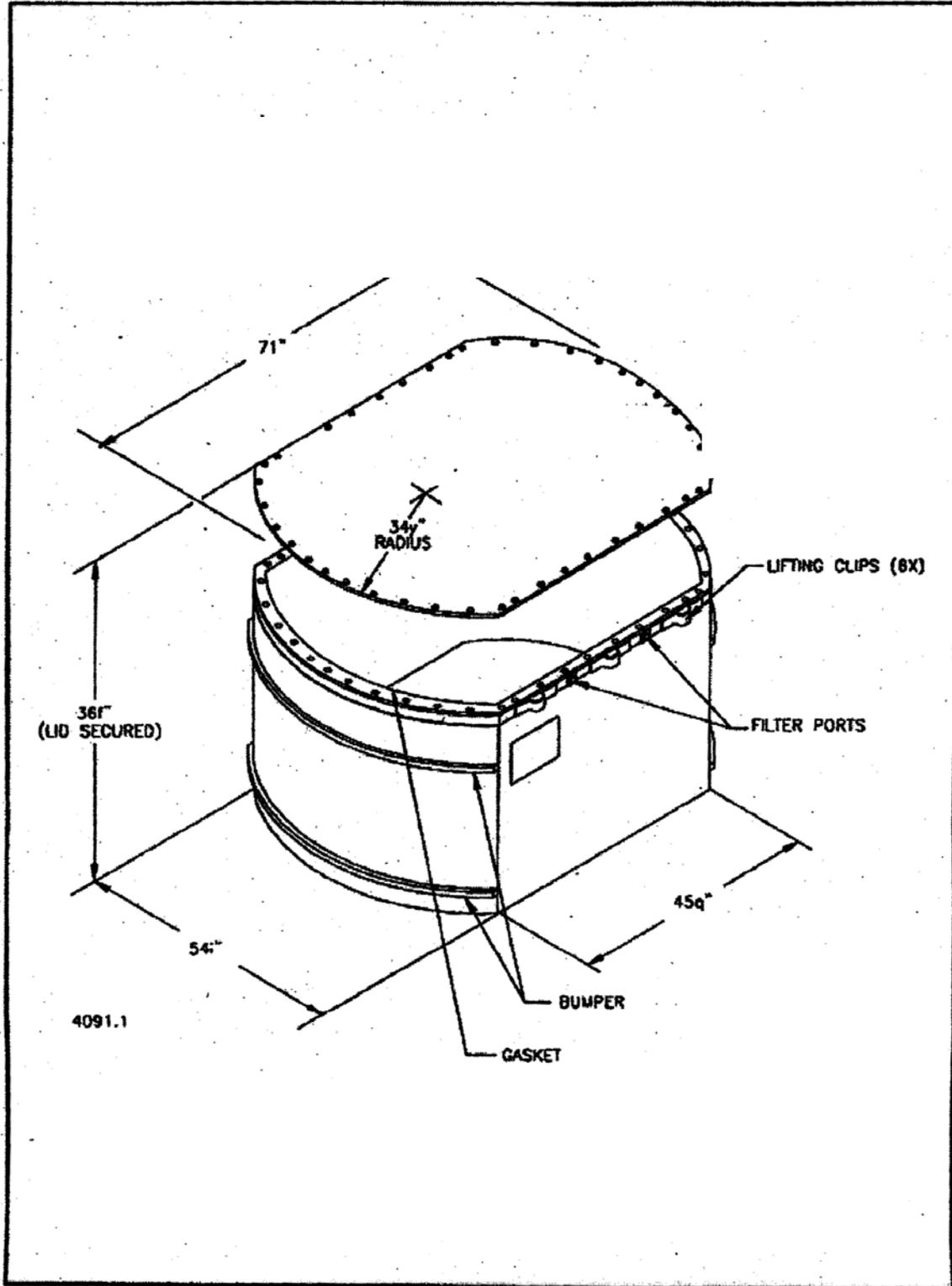


Figure M1-4  
Standard Waste Box

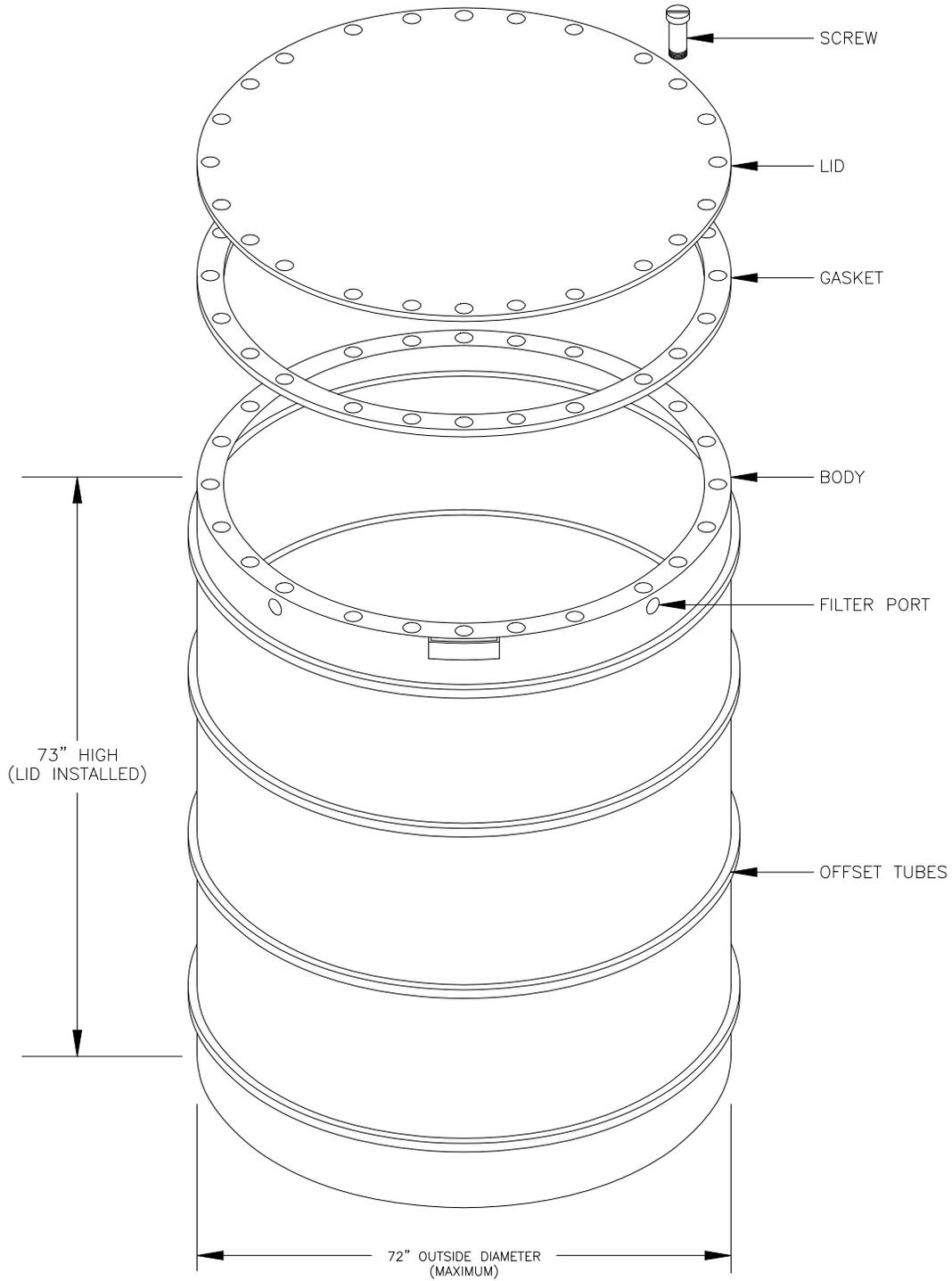


Figure M1-5  
Ten-Drum Overpack

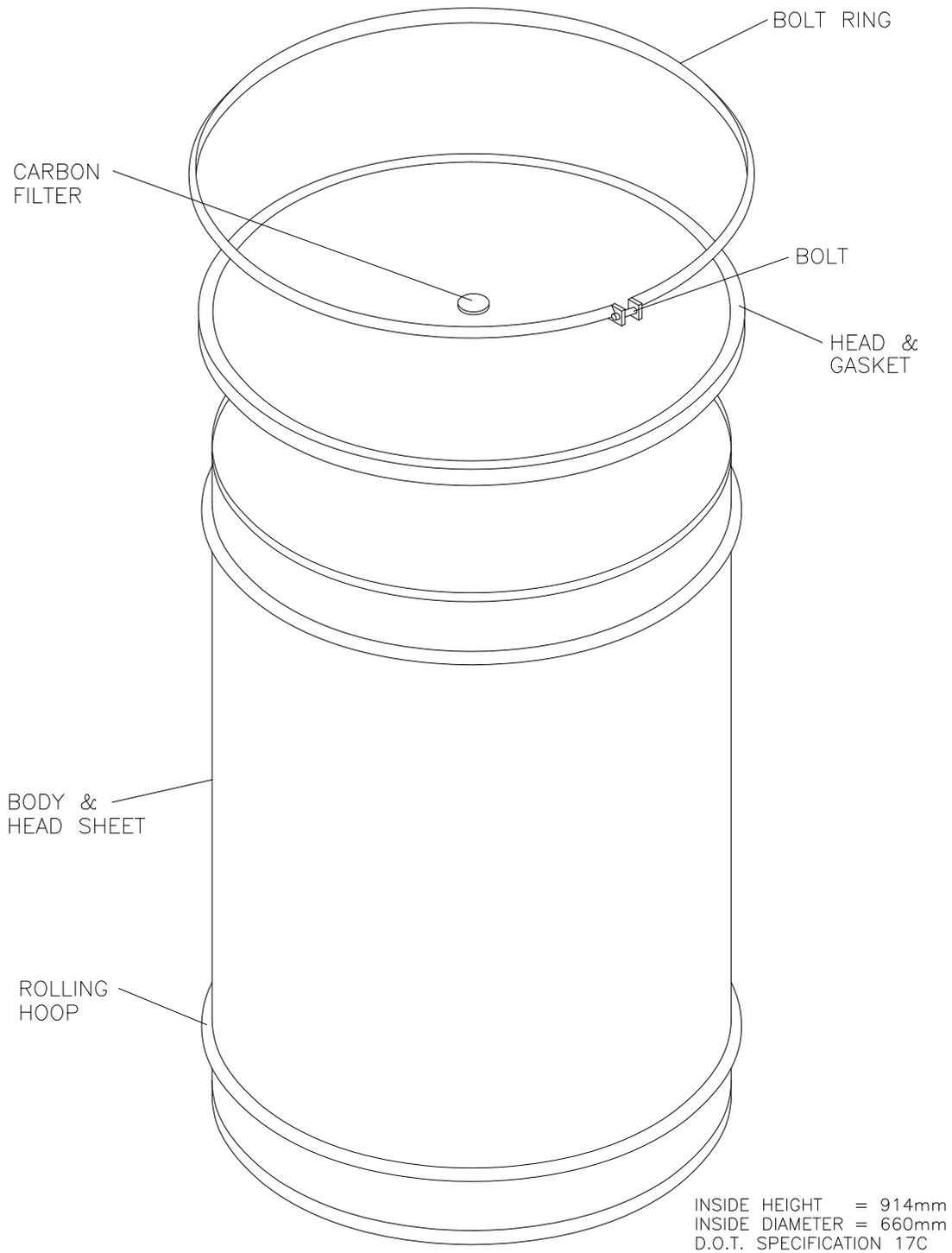


Figure M1-6  
85-Gallon Drum

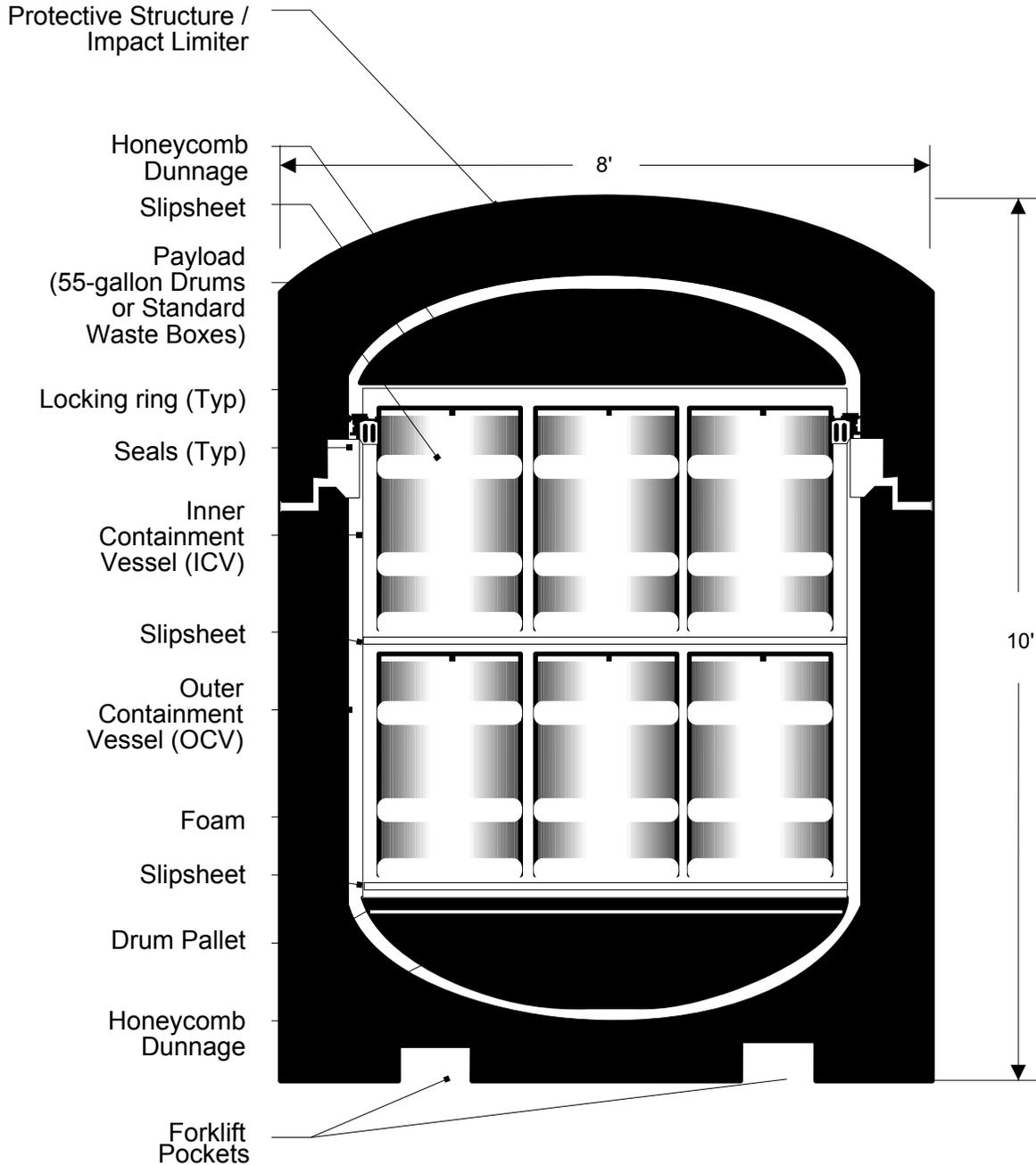


Figure M1-8a  
TRUPACT-II Shipping Container for CH Transuranic Mixed Waste (Schematic)

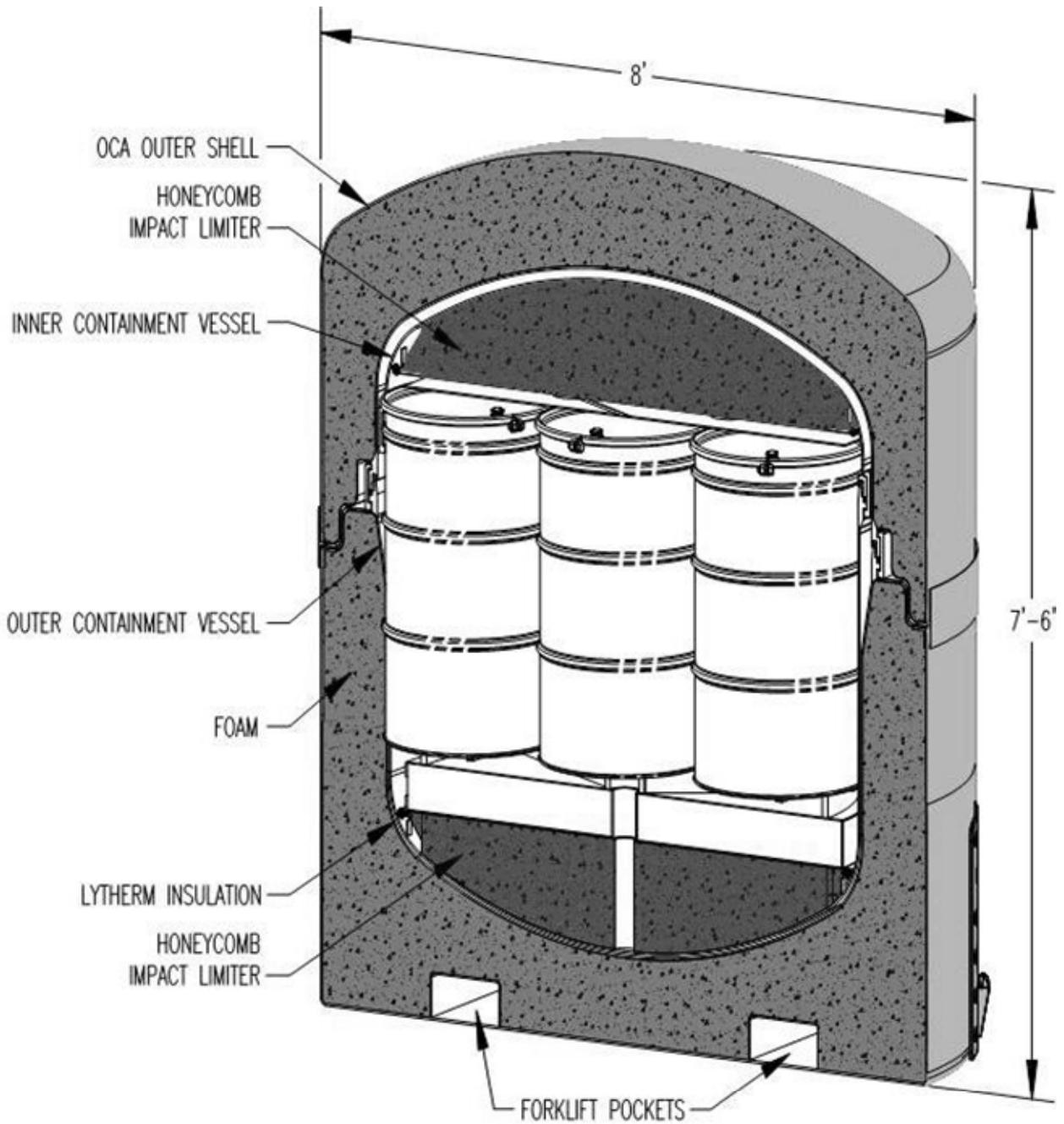


Figure M1-8b  
Typical HalfPACT Shipping Container for CH Transuranic Mixed Waste (Schematic)

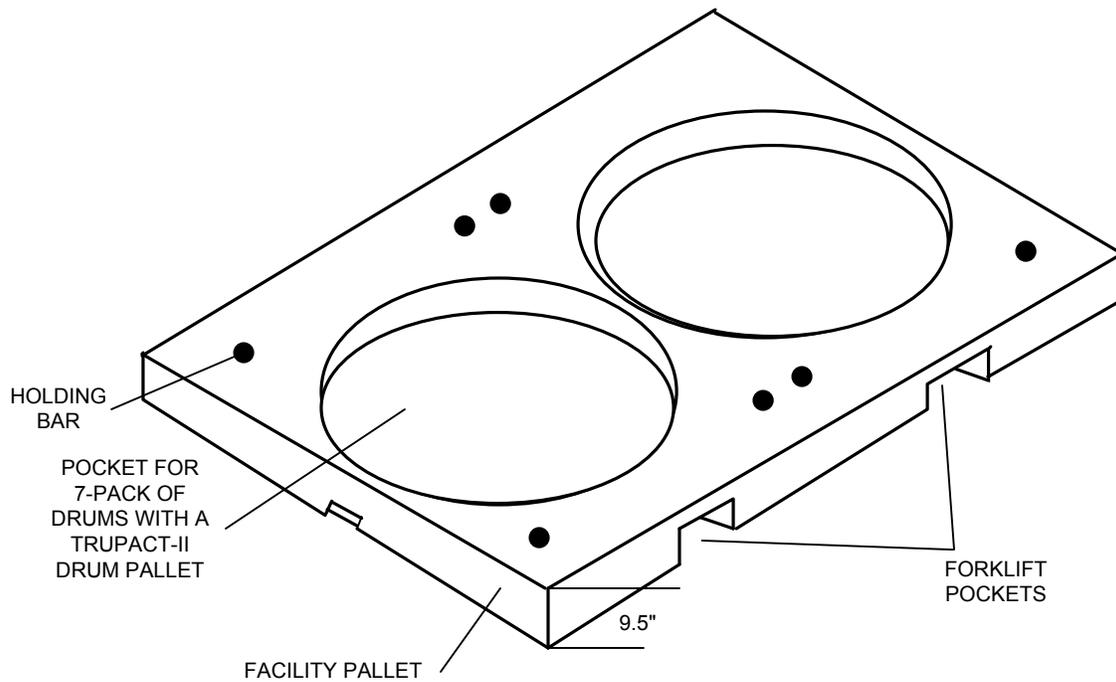


Figure M1-10  
Facility Pallet for Seven-Pack of Drums

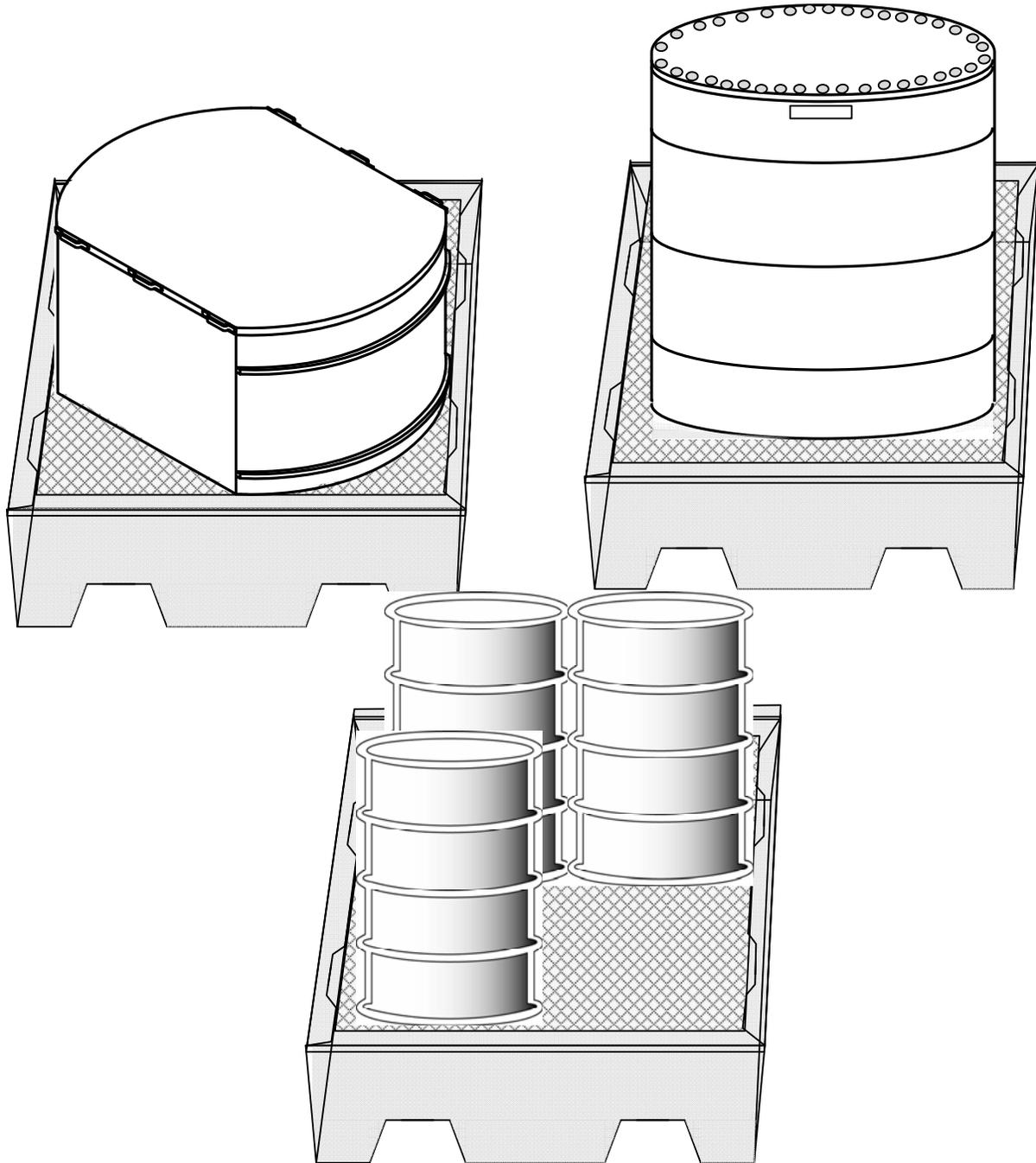


Figure M1-10a  
Typical Containment Pallet

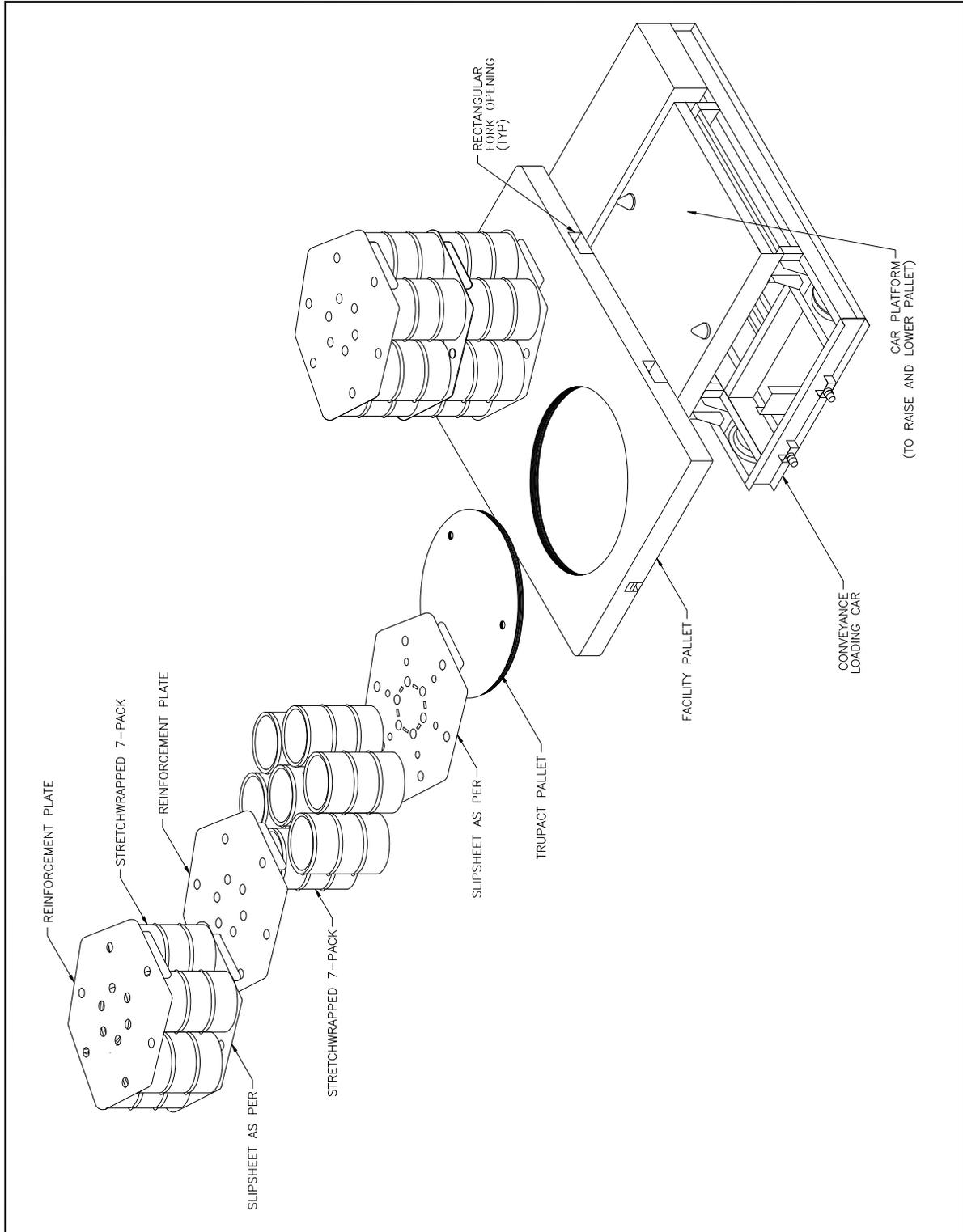


Figure M1-11  
Facility Transfer Vehicle (Example) with Seven-Packs and Facility Pallet

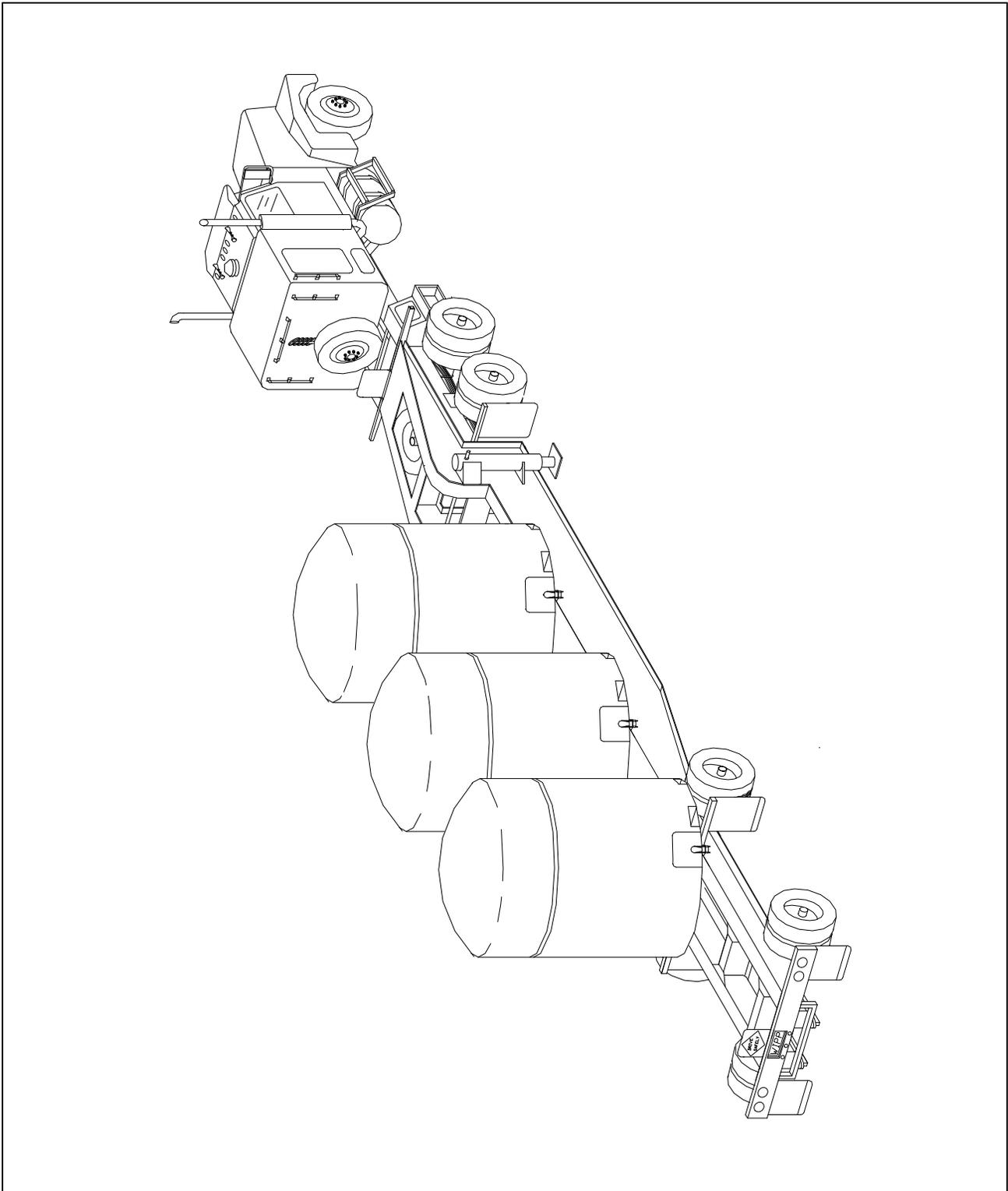


Figure M1-12  
TRUPACT-II Containers on Trailer

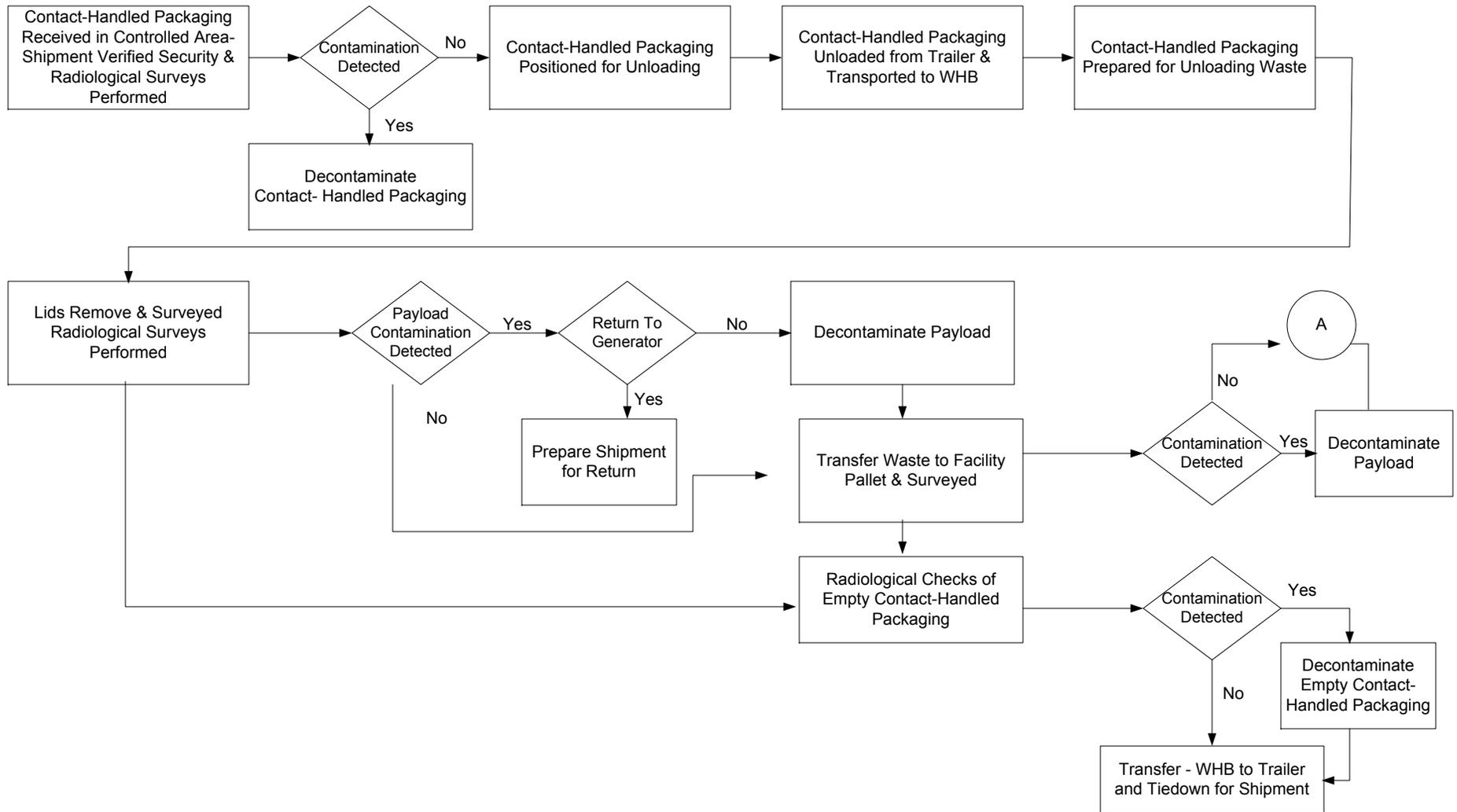


Figure M1-13  
 WIPP Facility Surface and Underground CH Transuranic Mixed Waste Process Flow

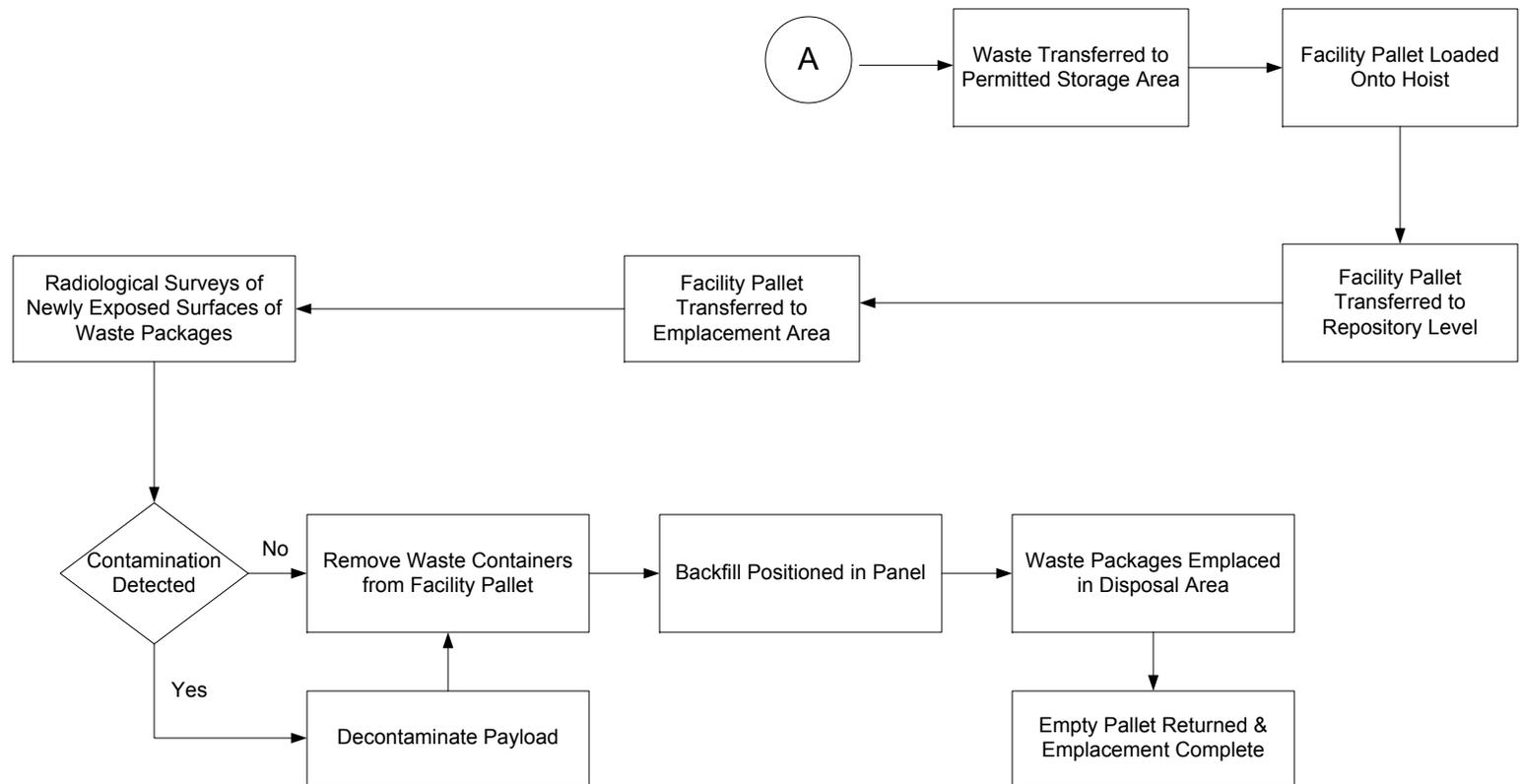
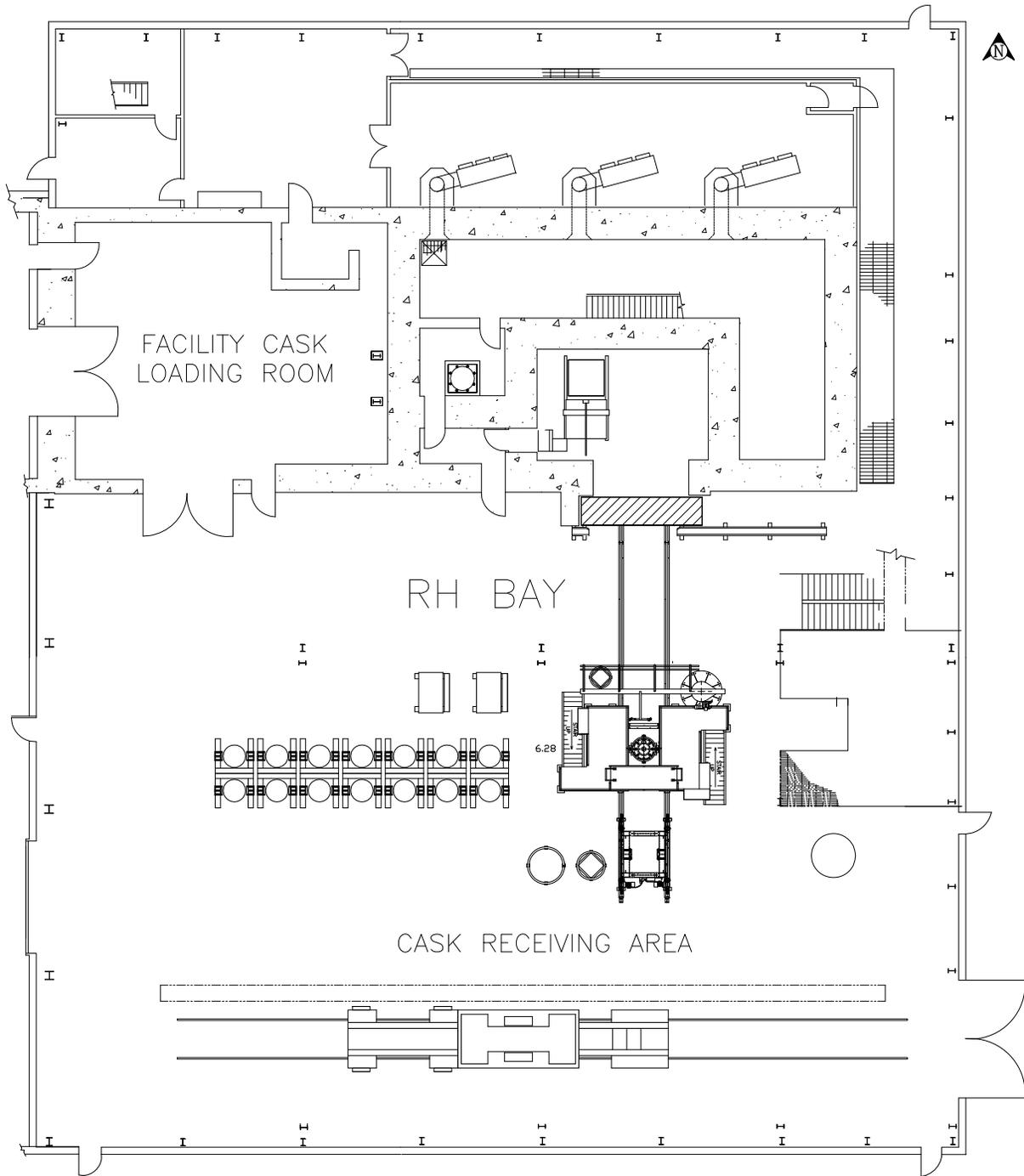


Figure M1-13  
 WIPP Facility Surface and Underground CH Transuranic Mixed Waste Process Flow (continued)



Figures M1-14a  
RH Bay Ground Floor

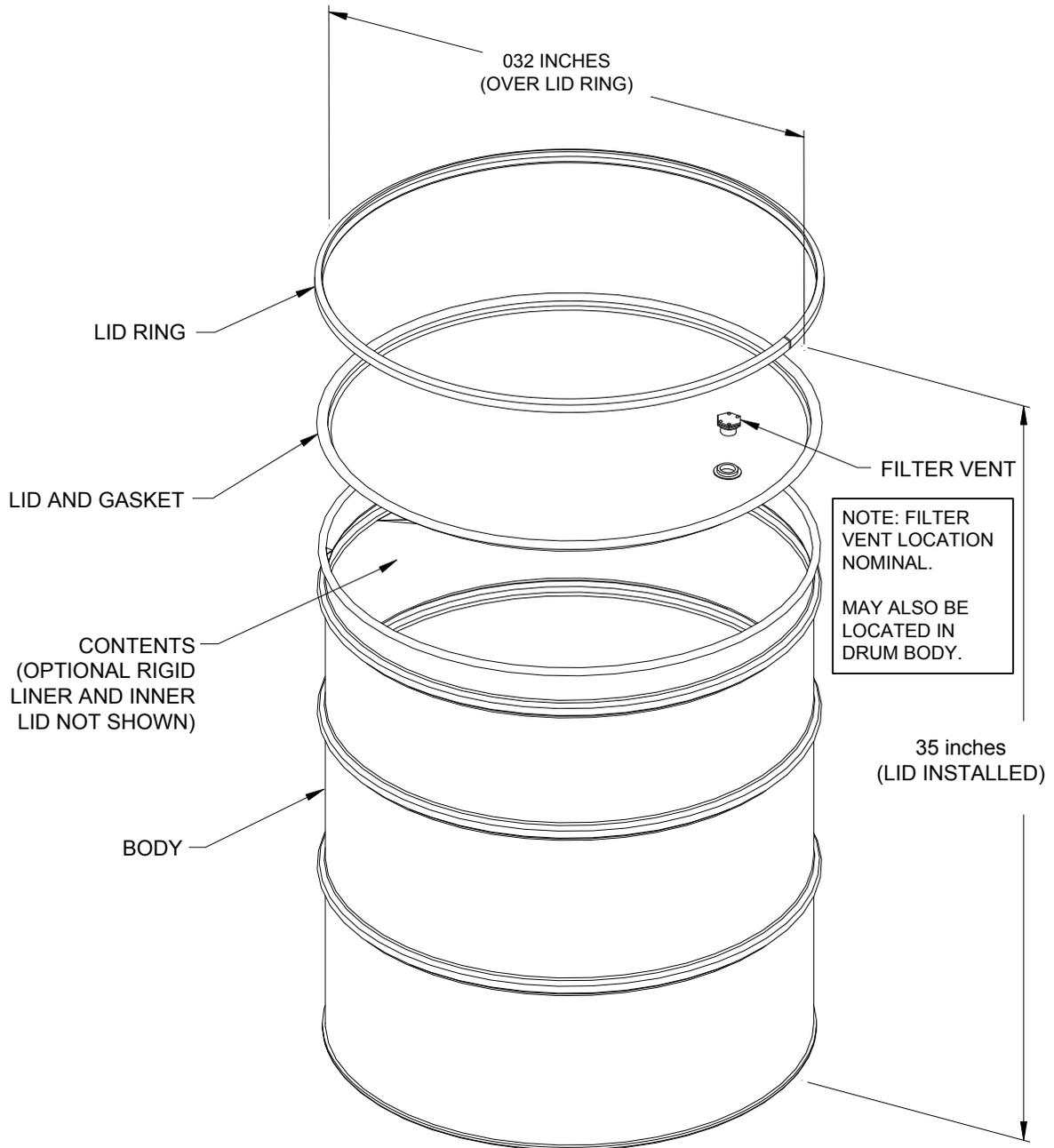


Figure M1-15  
100-Gallon Drum

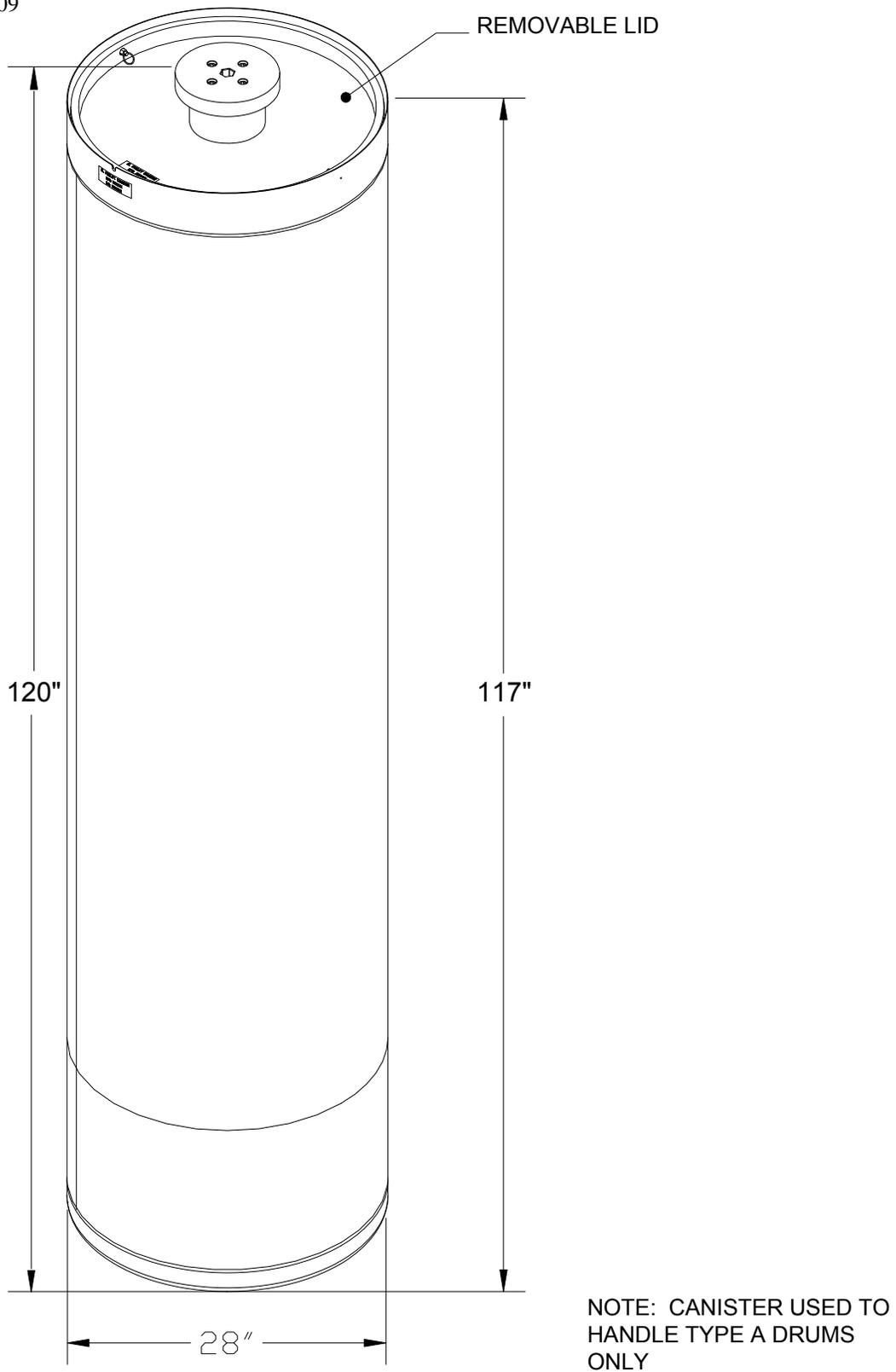


Figure M1-16  
RH-TRU Facility Canister Assembly

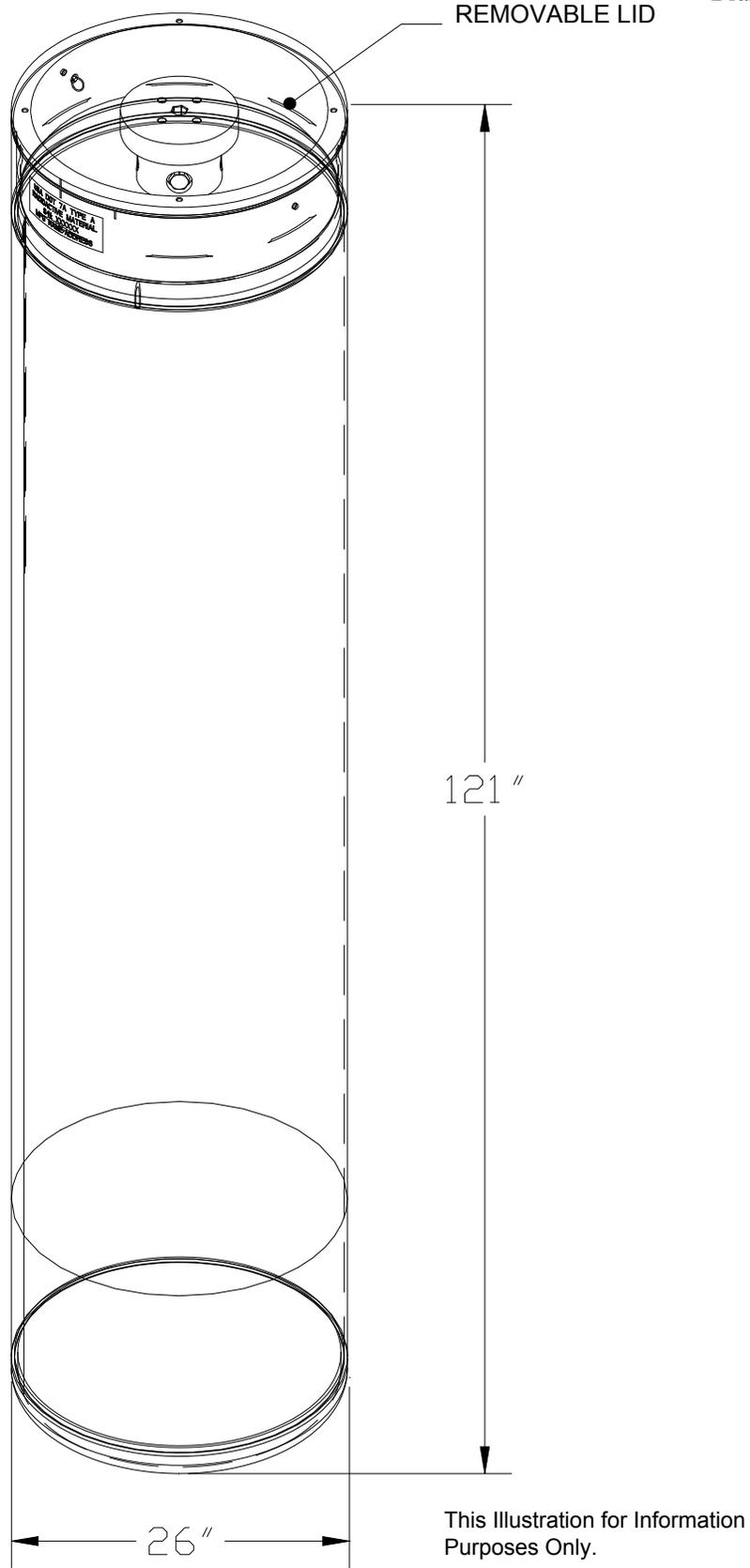


Figure M1-16a  
RH-TRU 72B Canister Assembly

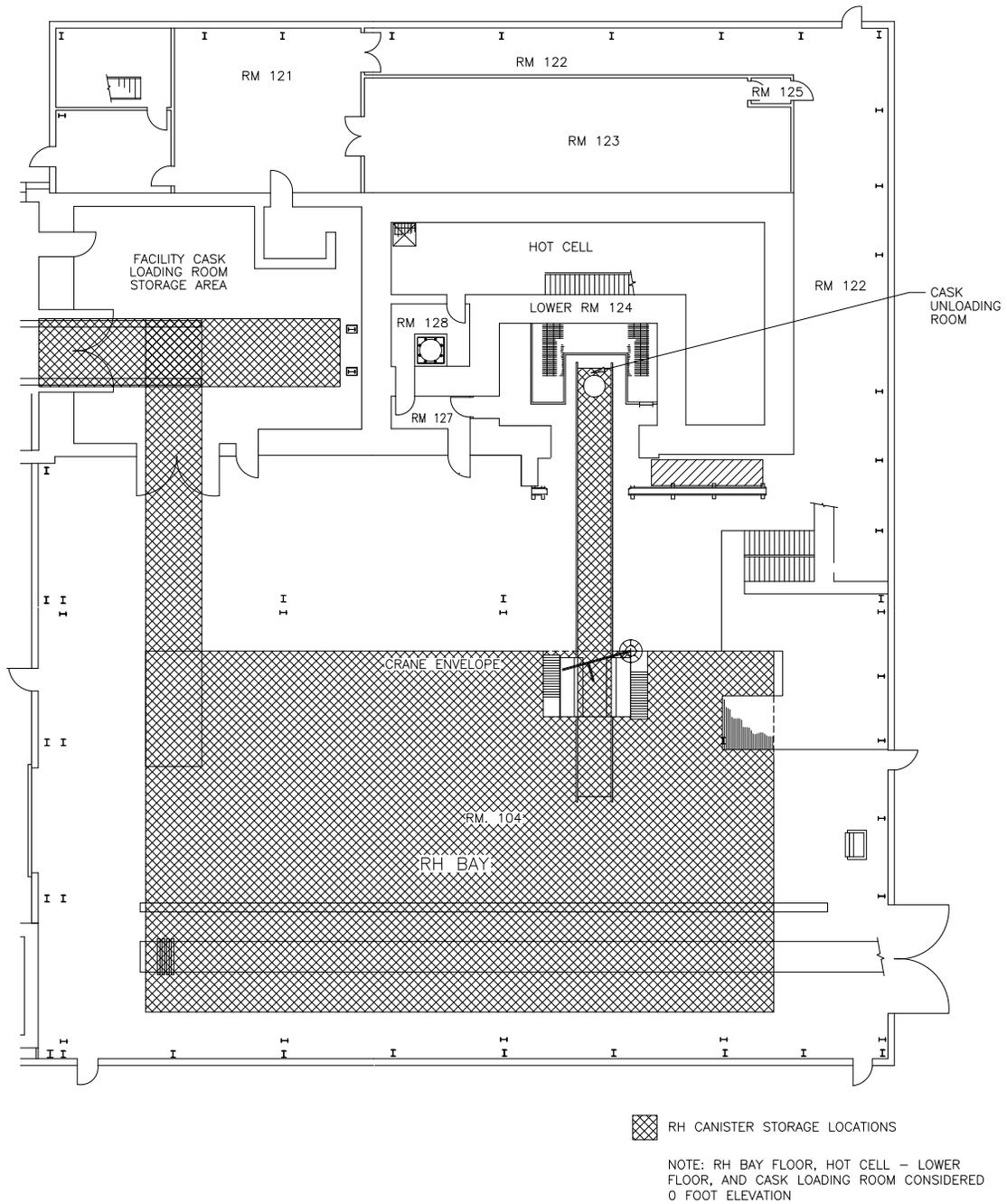
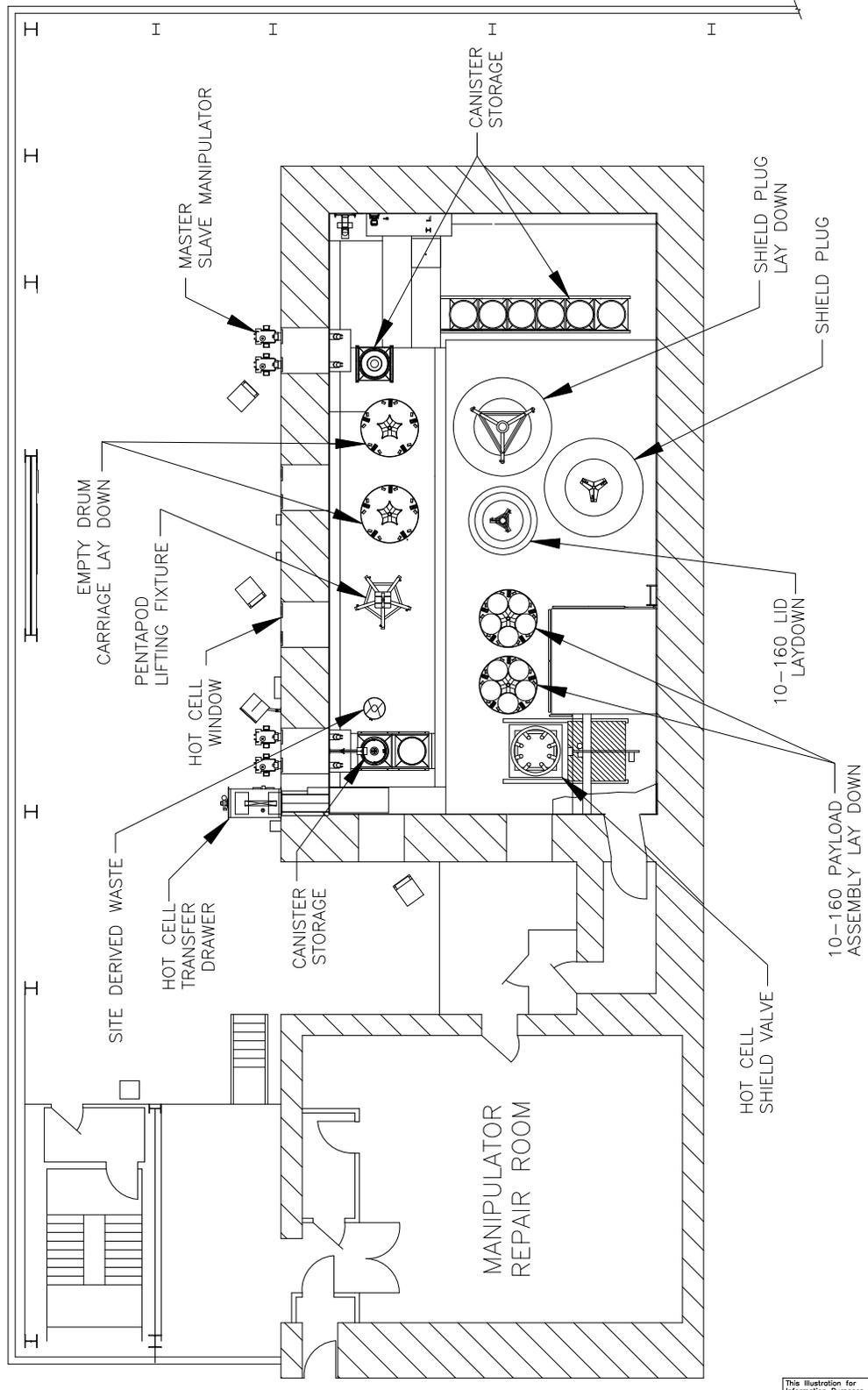


Figure M1-17a  
RH Bay, Cask Unloading Room, Hot Cell, Facility Cask Loading Room



This illustration for Information Purposes only.

Figure M1-17b  
 RH Hot Cell Storage Area

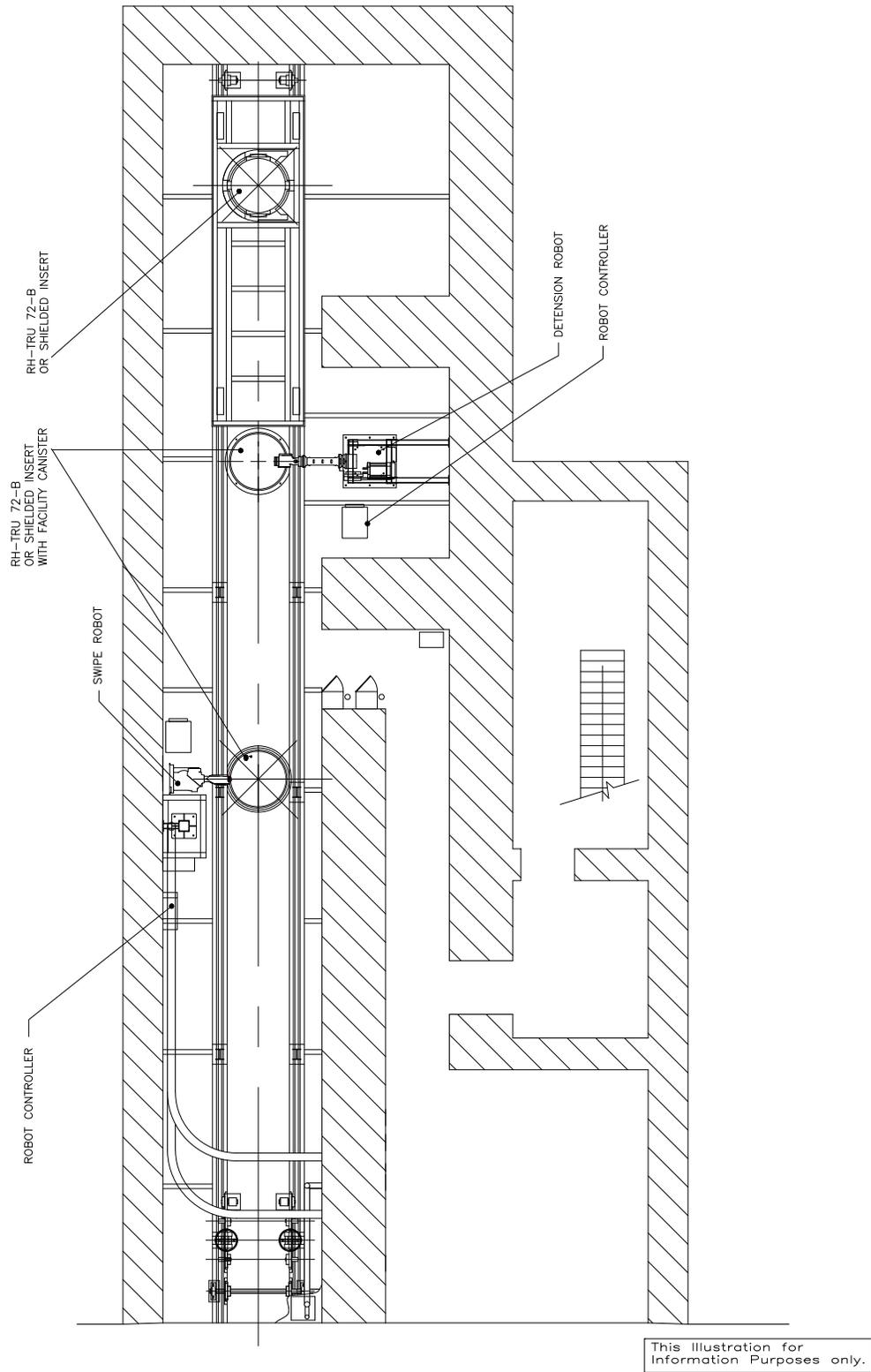


Figure M1-17c  
RH Canister Transfer Cell Storage Area

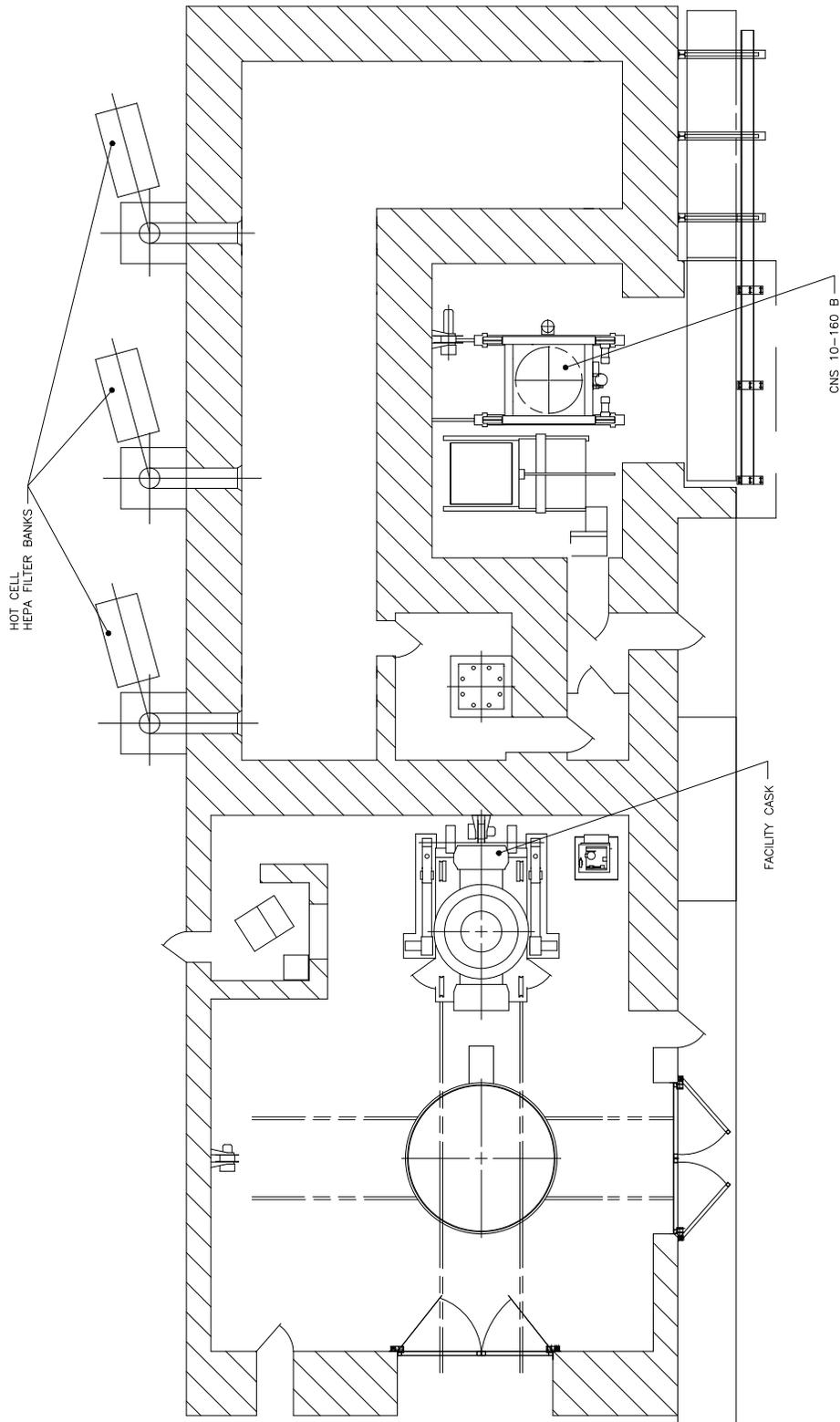


Figure M1-17d  
RH Facility Cask Loading Room Storage Area

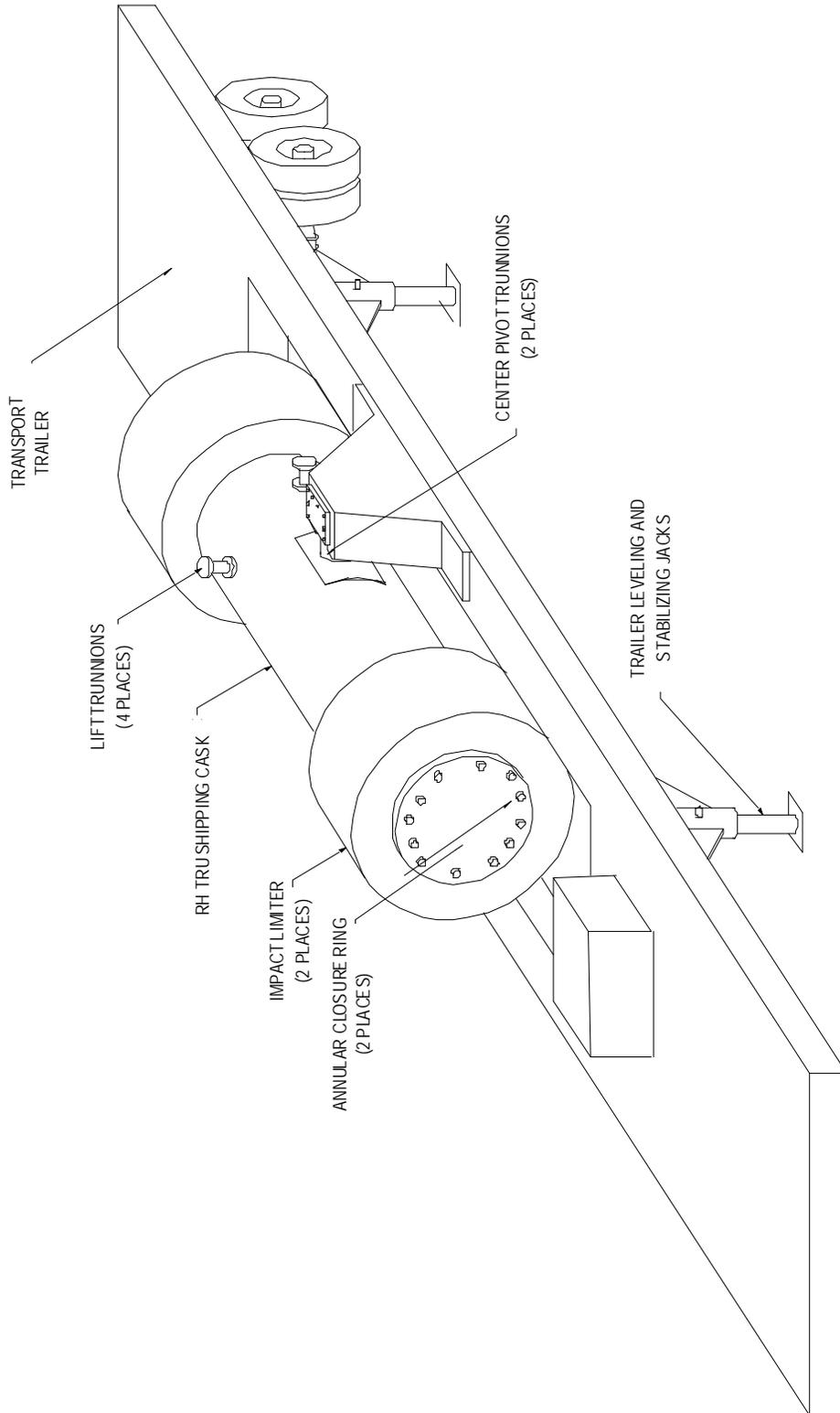


Figure M1-18  
RH-TRU 72B Shipping Cask on Trailer

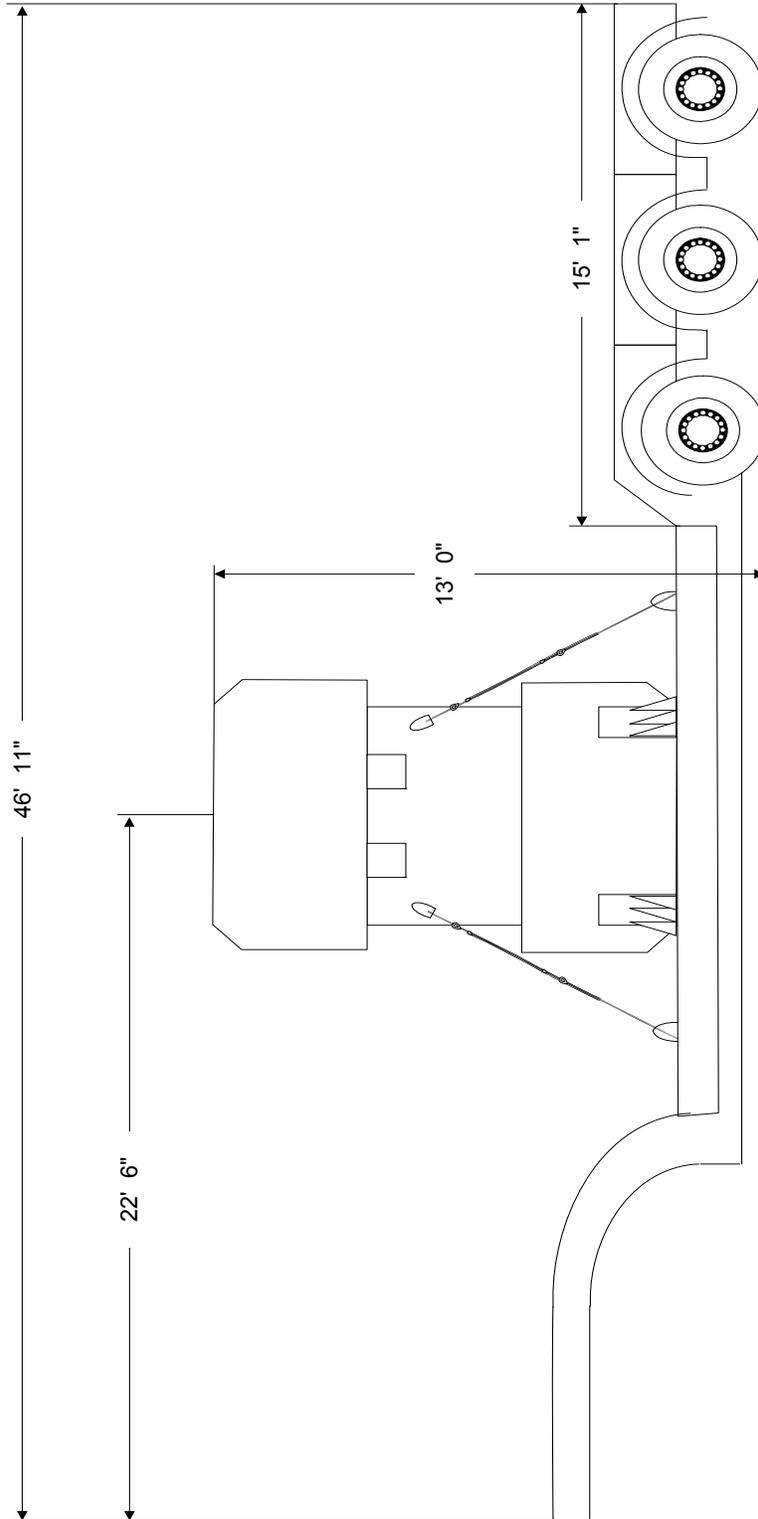


Figure M1-19  
CNS 10-160B Shipping Cask on Trailer

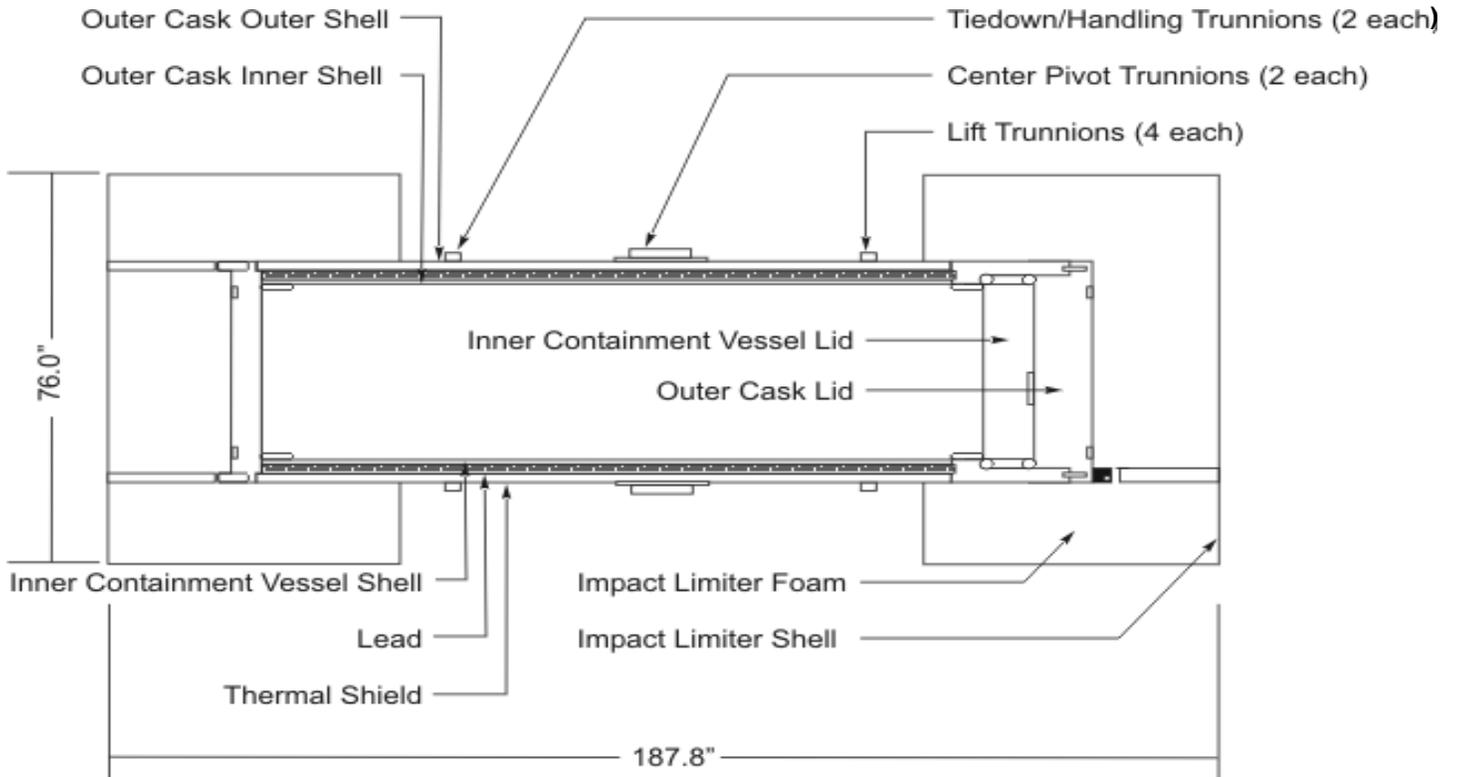


Figure M1-20  
RH-TRU 72-B Shipping Cask for RH Transuranic Waste (Schematic)

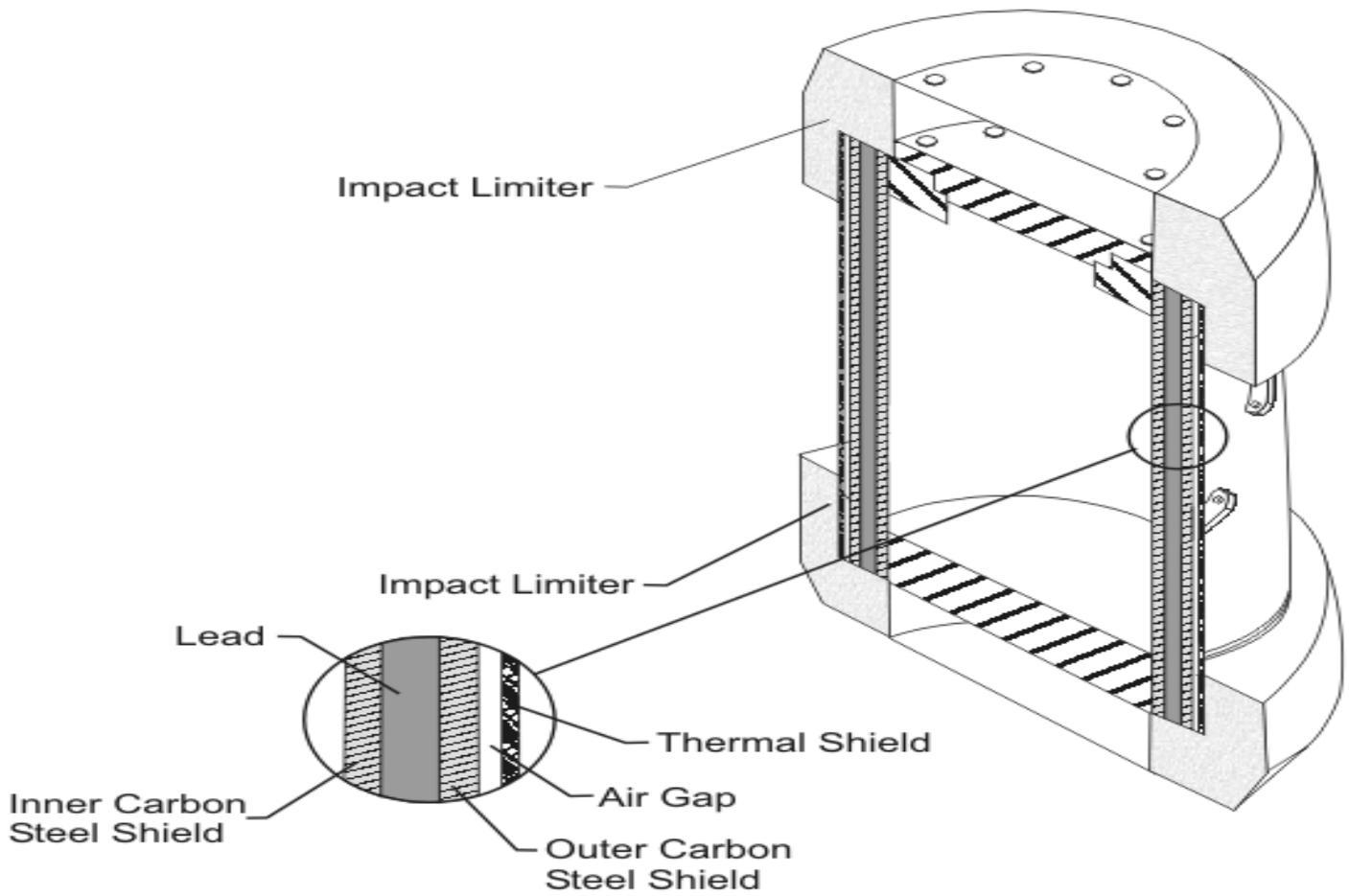


Figure M1-21  
10-160B Shipping Cask for RH Transuranic Waste (Schematic)

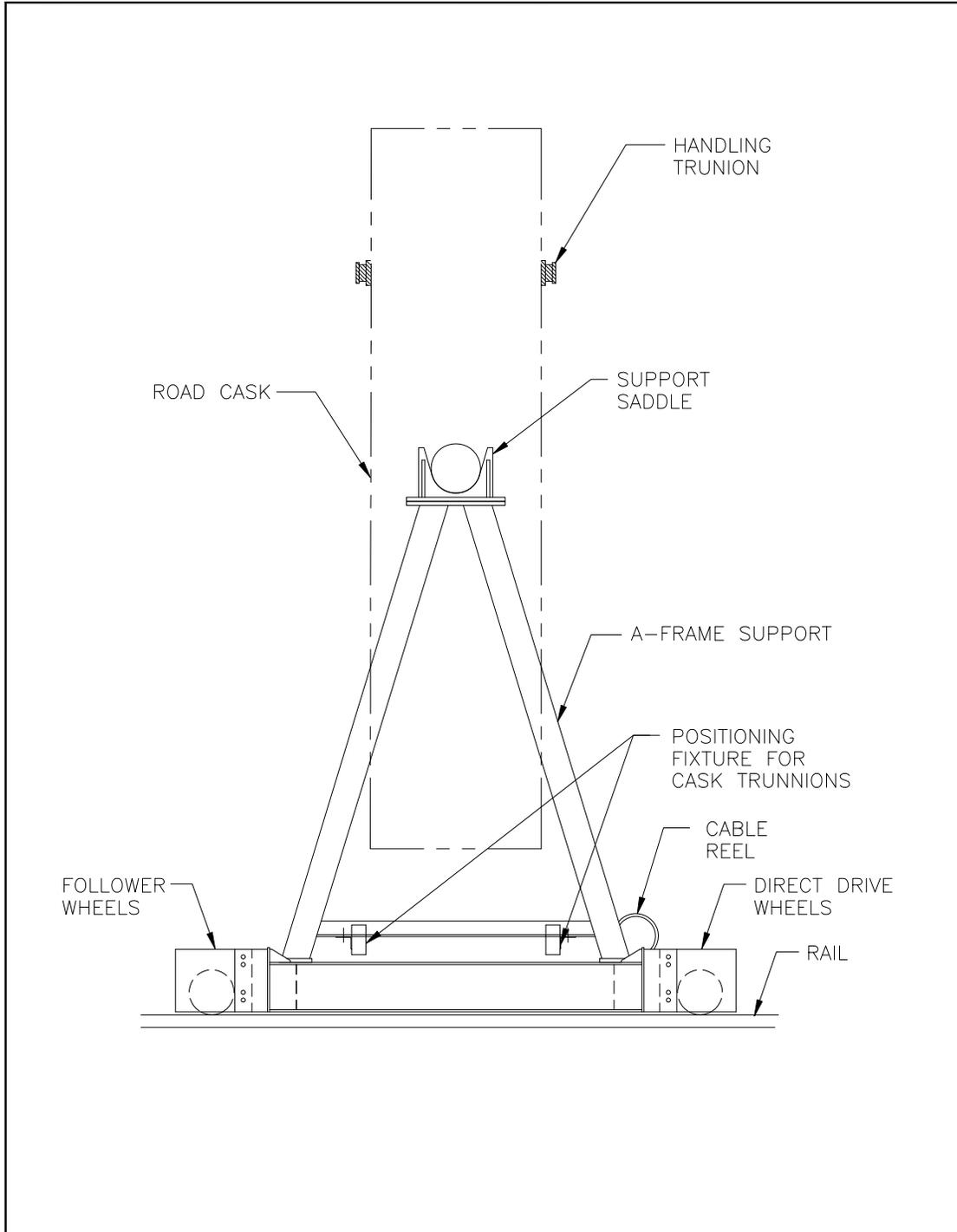
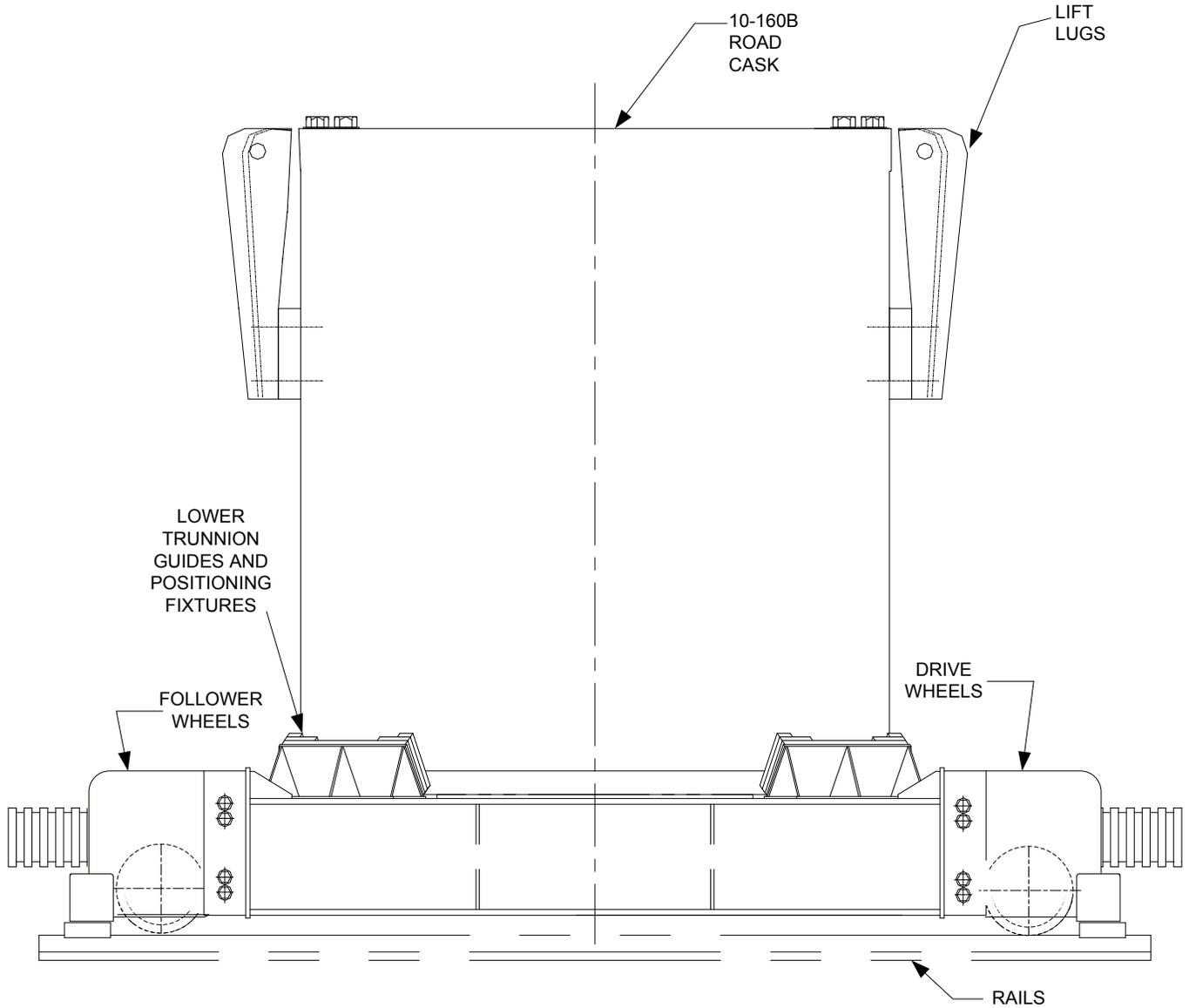


Figure M1-22a  
RH-72b Cask Transfer Car



This Illustration for Information  
Purposes Only

Figure M1-22b  
10-160B Cask Transfer Car

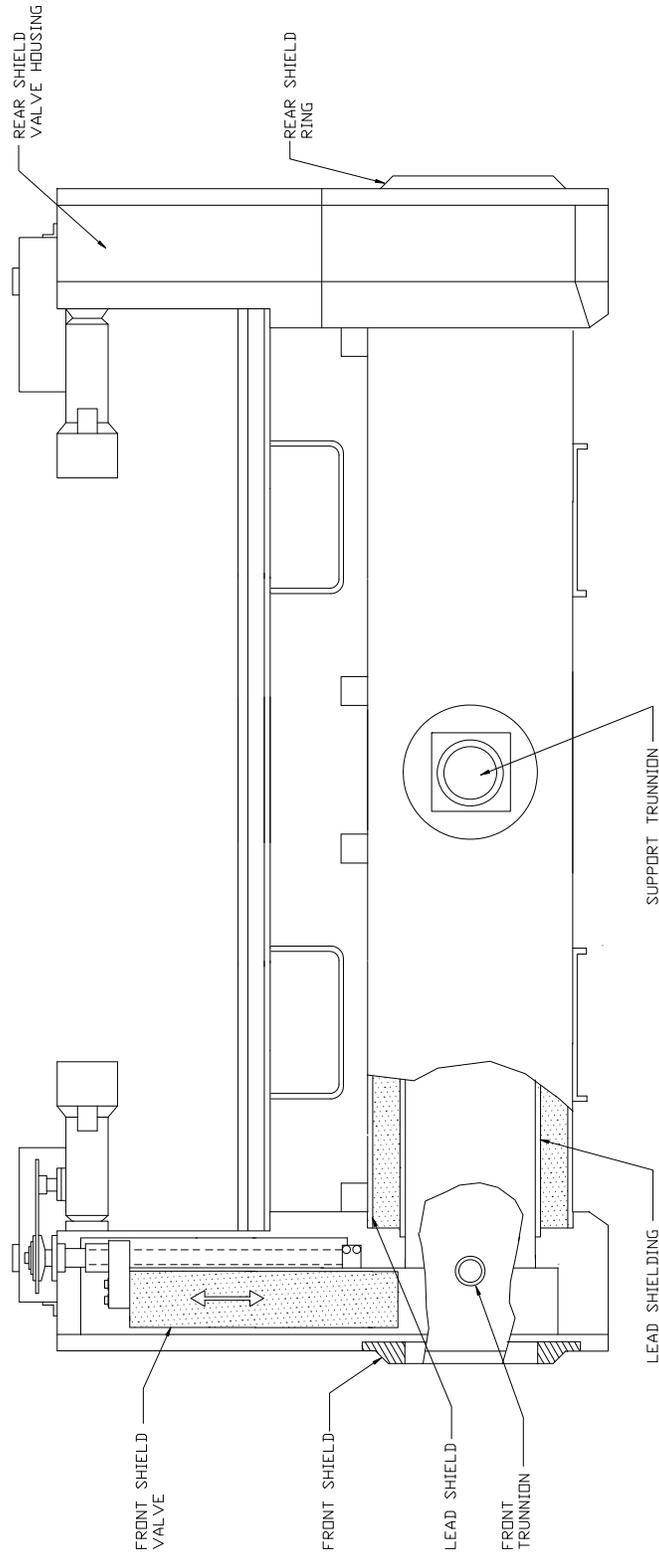


Figure M1-23  
RH Transuranic Waste Facility Cask

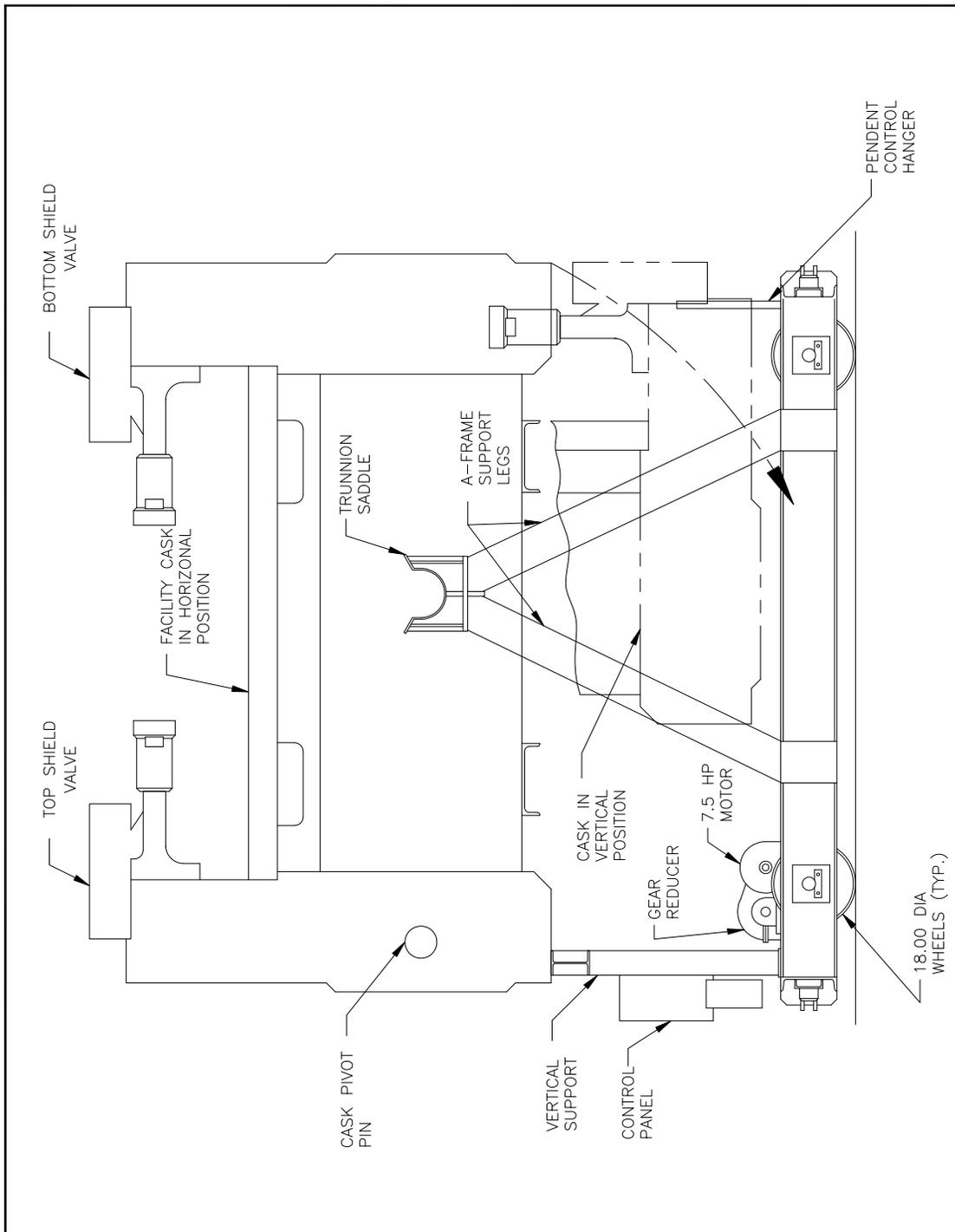


Figure M1-24  
Facility Cask Transfer Car (Side View)

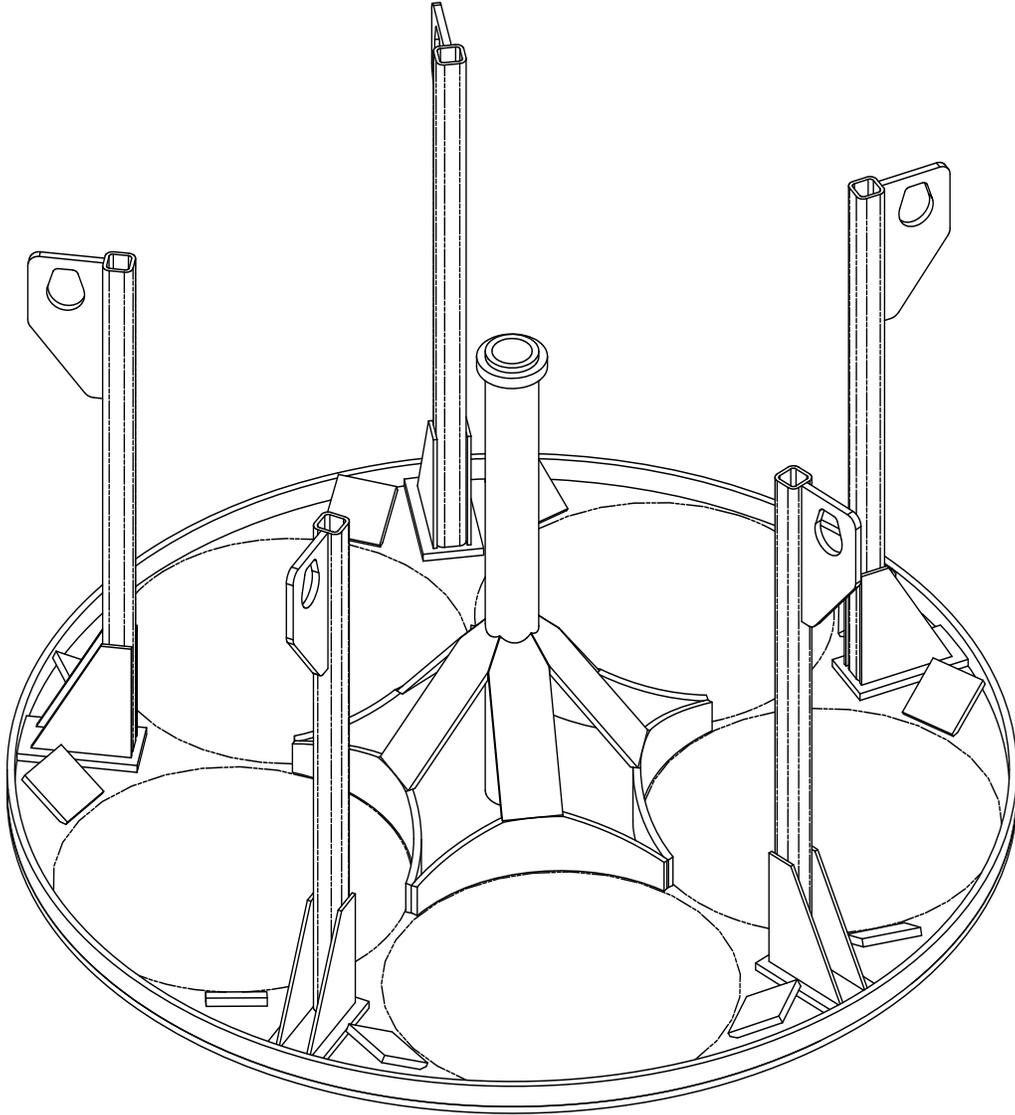
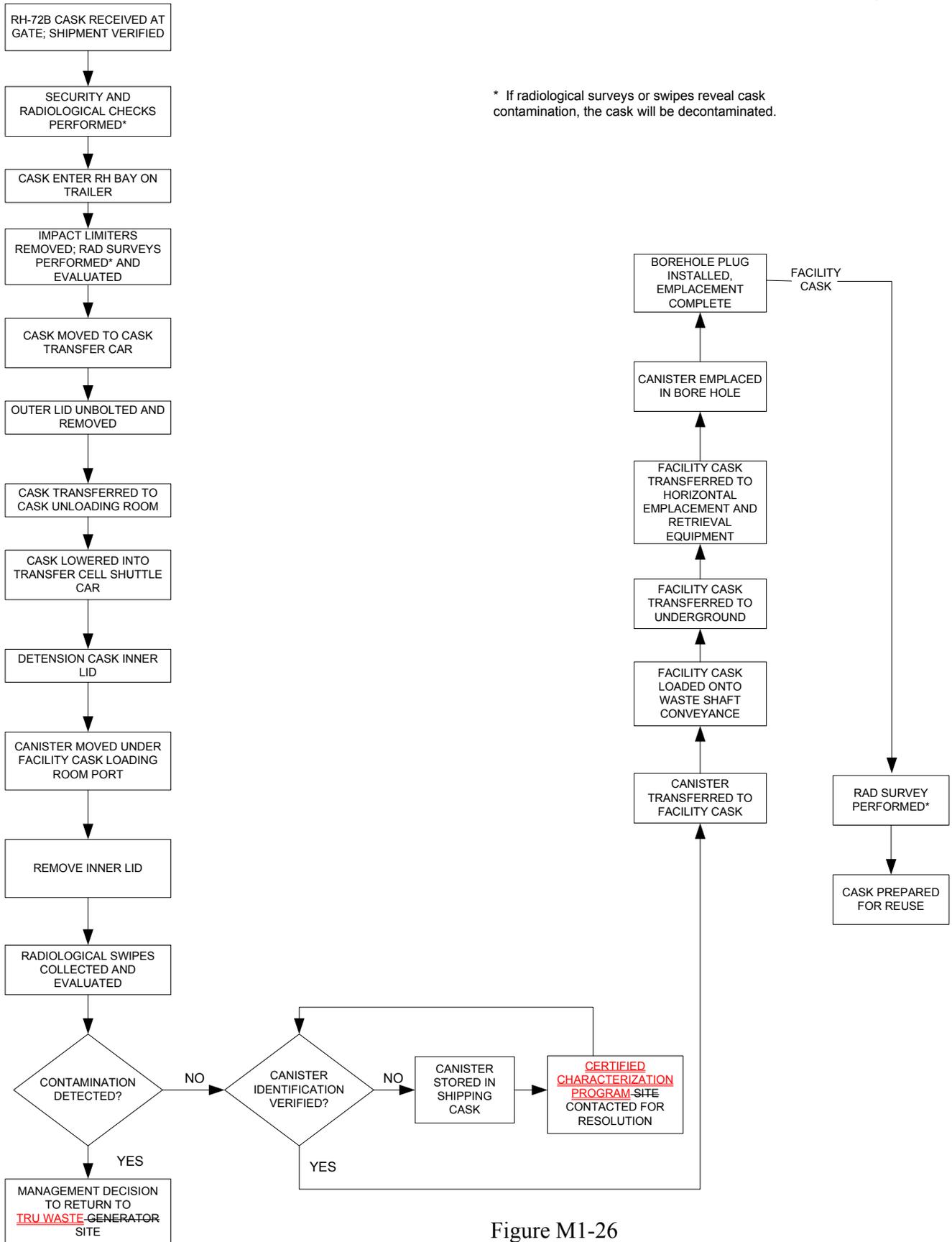
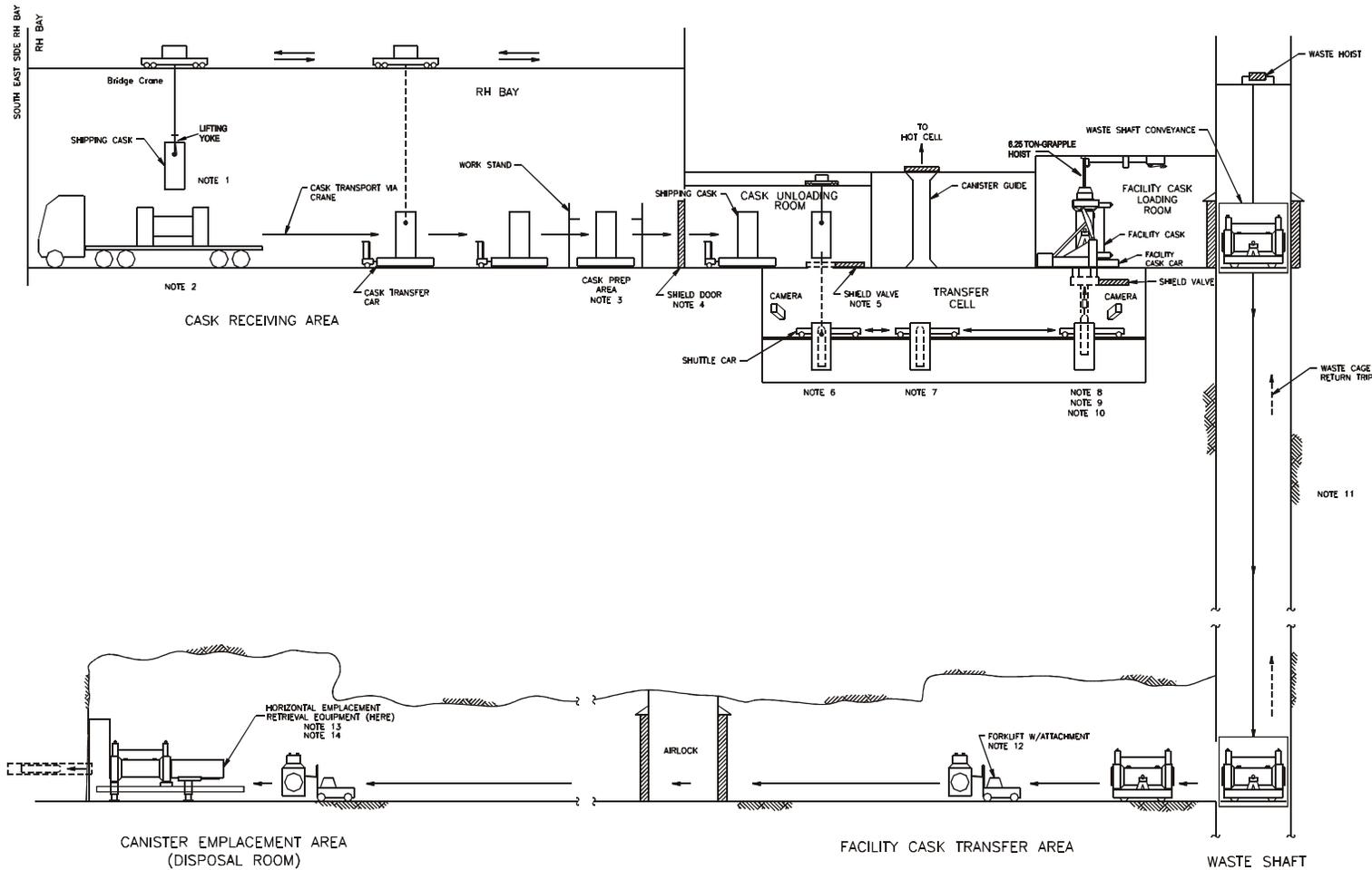


Figure M1-25  
CNS 0-160B Drum Basket



\* If radiological surveys or swipes reveal cask contamination, the cask will be decontaminated.

Figure M1-26  
 Surface and Underground RH Transuranic Mixed Waste Process Flow  
 Diagram for RH-TRU 72-B Shipping Cask  
 RENEWAL APPLICATION APPENDIX M1



- | NOTES |  |
|-------|--|
| 1.    | REMOVE IMPACT LIMITERS BEFORE LIFTING CASK FROM TRANSPORTER WITH 25 TON CRANE.   |
| 2.    | CASK TRANSPORTED TO THE WORK STAND ON CASK TRANSFER CAR.   |
| 3.    | RAD SURVEYS CONDUCTED AND OUTER LID REMOVED  |
| 4.    | SHIELD DOOR IS NOT CLOSED FOR LOADING 72B CASK WITH CANISTER INTO THE TRANSFER CELL.                                   |
| 5.    | CASK UNLOADING ROOM FLOOR SHIELD VALVE IS CLOSED WHEN 72B CASK WITH CANISTER IS IN TRANSFER CELL.                      |
| 6.    | 72B CASK WITH CANISTER IS LOWERED INTO THE TRANSFER CELL SHUTTLE CAR.  |
| 7.    | CASK INNER LID DETENSIONED ROBOTICALLY.  |
| 8.    | CASK INNER LID REMOVED WITH THE FACILITY GRAPPLE AND CHECKED FOR CONTAMINATION ROBOTICALLY PRIOR TO REMOVING CANISTER. |
| 9.    | SWIPES TAKEN ROBOTICALLY AND CHECKED FOR CONTAMINATION AS CANISTER IS RAISED INTO FACILITY CASK.                       |
| 10.   | WASTE CANISTER LIFTED USING FACILITY GRAPPLE INTO FACILITY CASK.   |
| 11.   | WASTE IS LOWERED TO THE UNDERGROUND FOR DISPOSAL.  |
| 12.   | FORKLIFT (41-TON) IS USED TO TRANSFER THE FACILITY CASK TO THE DISPOSAL ROOM.  |
| 13.   | THE HERE IS USED TO PUSH THE CANISTER OUT OF THE FACILITY CASK INTO THE DISPOSAL BOREHOLE.                             |
| 14.   | A SHIELD PLUG IS THEN EMPLACED OVER THE BOREHOLE TO MINIMIZE RADIATION EXPOSURE FROM THE EMPLACED CANISTER.            |

R.H. WASTE HANDLING  
 MECHANICAL FLOW DIAGRAM  
 (72B CASK)

Figure M1-28  
 Schematic of the RH Transuranic Waste Process for the RH-TRU 72-B Shipping Cask

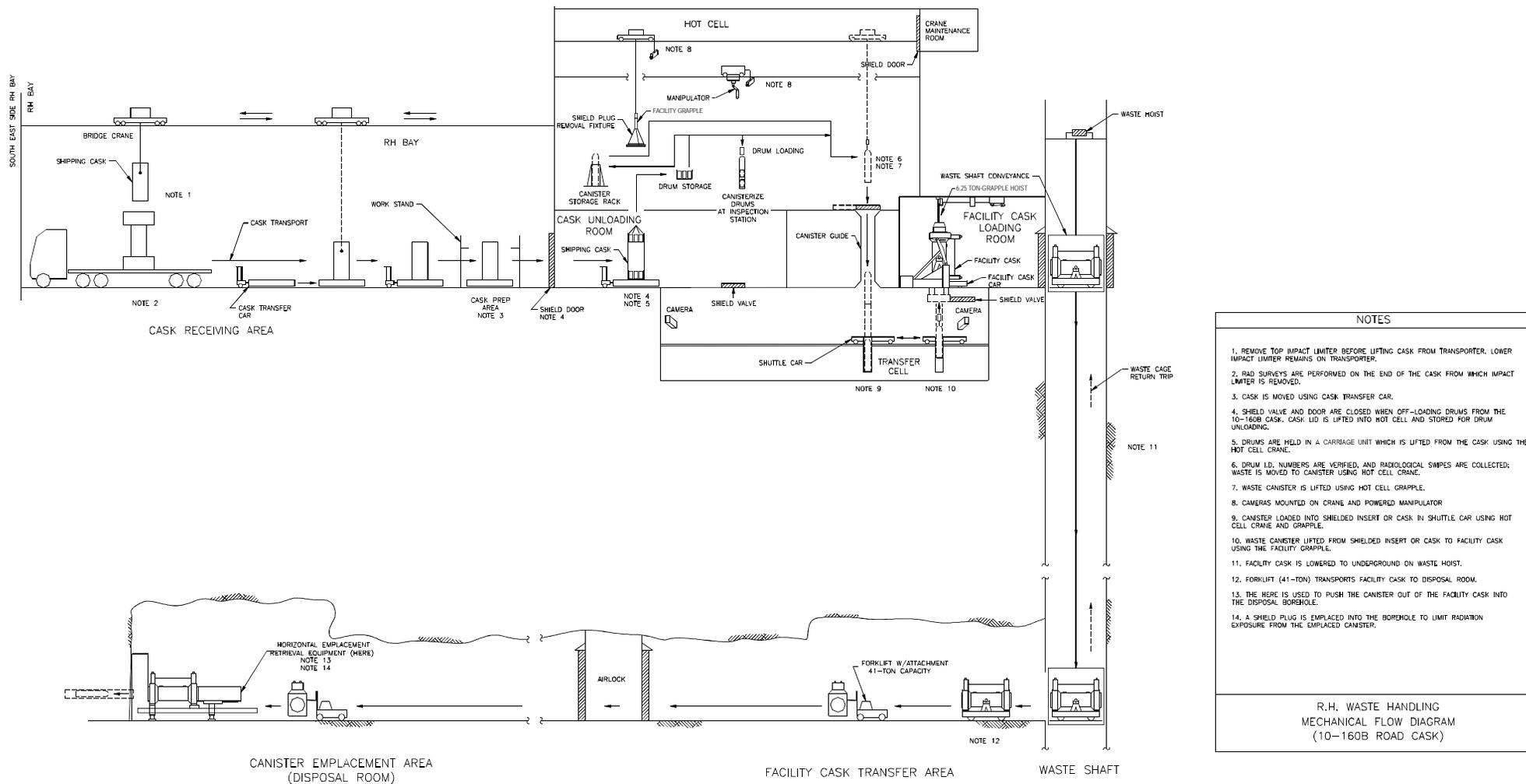


Figure M1-29  
 Schematic of the RH Transuranic Waste Process for the CNS 10-160B Shipping Cask

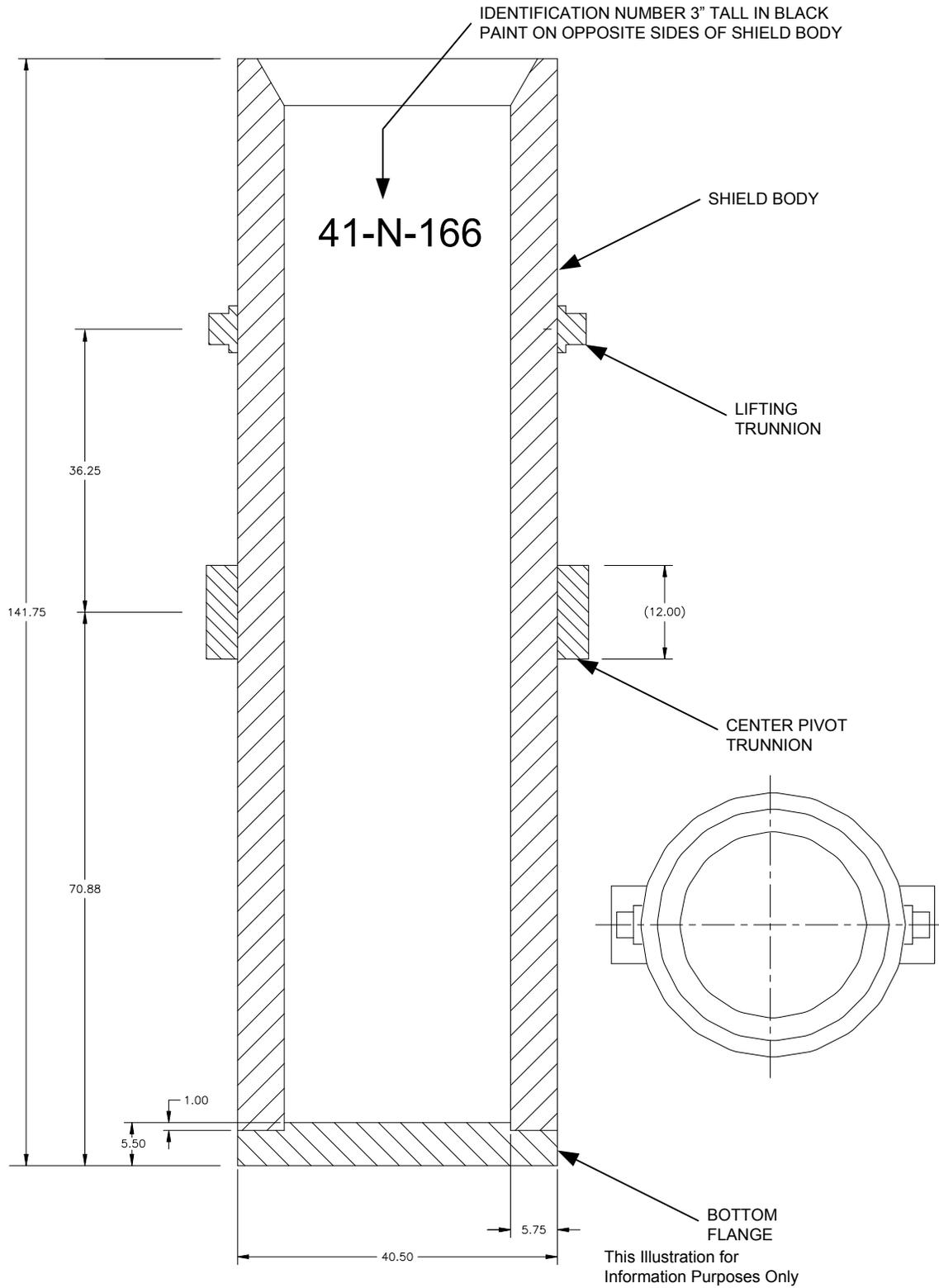


Figure M1-30  
RH Shielded Insert Assembly

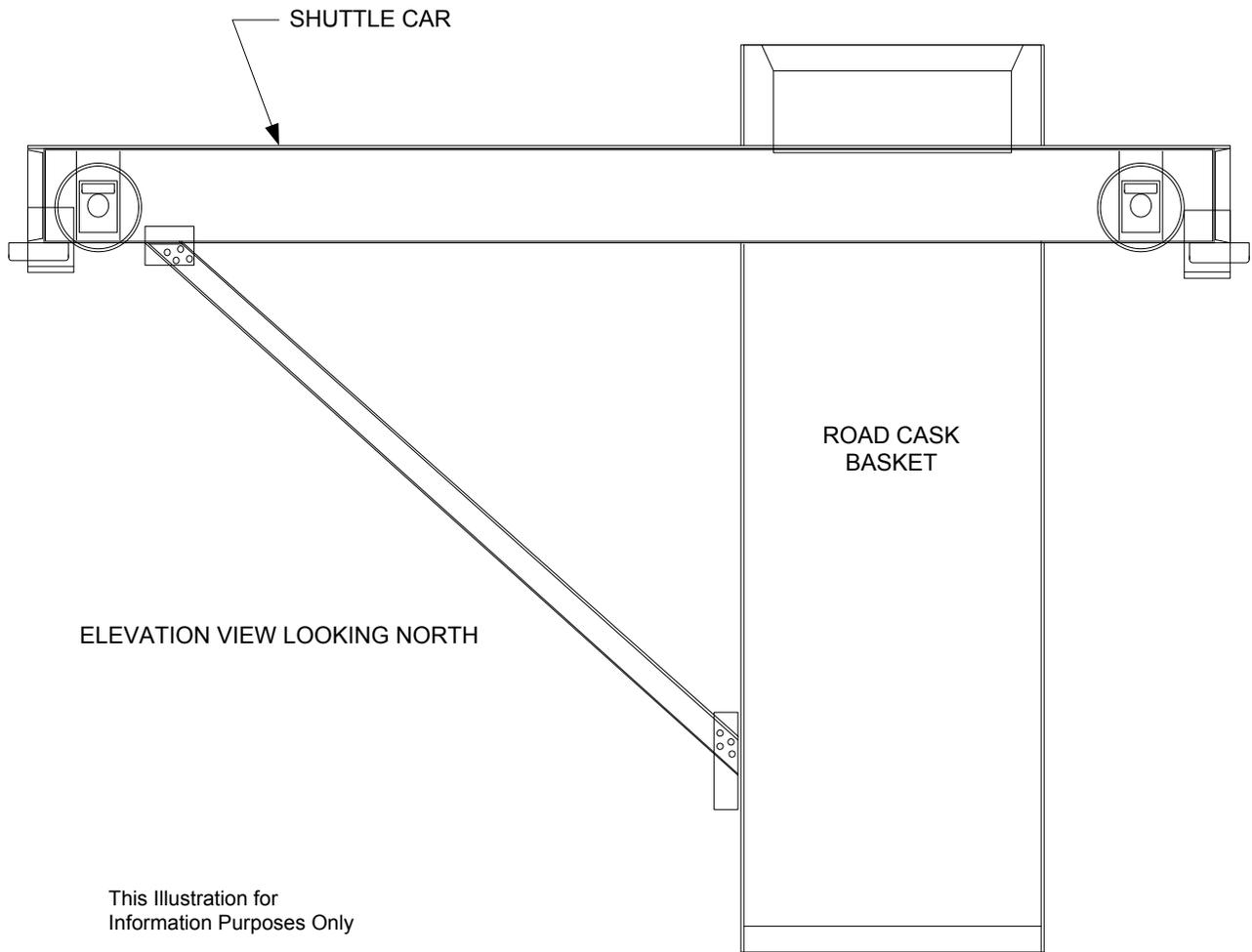
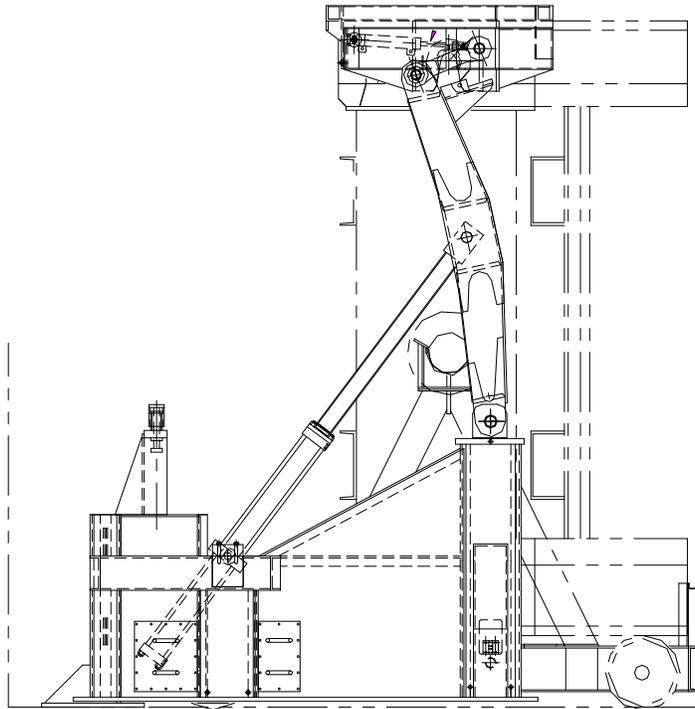
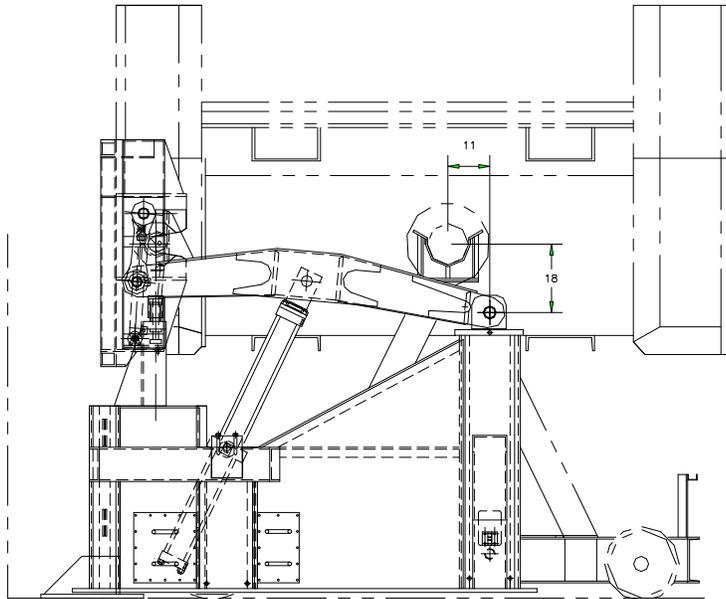


Figure M1-31  
Transfer Cell Shuttle Car



FRONT ELEVATION  
CASK VERTICAL



FRONT ELEVATION  
CASK HORIZONTAL

This Illustration for  
Information Purposes Only

SDDWH099.2

Figure M1-32  
Facility Cask Rotating Device

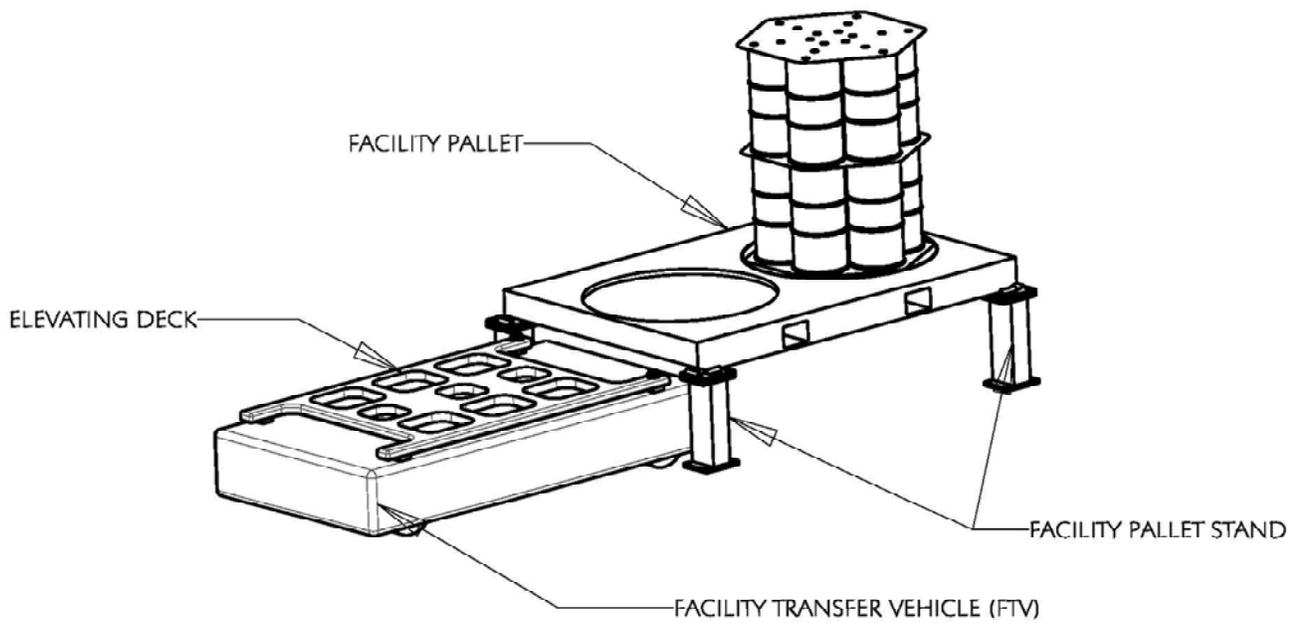


Figure M1-33  
Typical Pallet Stand