SECTION 4

PROCESS INFORMATION

MIXED WASTE FACILITY
RCRA/TSCA PERMIT APPLICATION

PERMA-FIX NORTHWEST RICHLAND, INC.

RICHLAND, WASHINGTON

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TABLES

ATTACHMENTS

4.0 PROCESS INFORMATION [D]

[WAC 173-303-806(4)(b)-(c), 173-303-630 through 670, 40 CFR 270.15-270.26, 40 CFR 264 Subparts I-CC]

This section describes the processes that take place at the MWF. Included are descriptions of the facility, equipment, process and storage procedures, management procedures and operations.

4.1 Containers [D-1]

[WAC 173-303-806(4)(b), 173-303-630, 40 CFR 270.15, 40 CFR 264 Subpart I]

4.1.1 Description of Containers [D-1a]

[WAC 173-303-630(4), 40 CFR 264.172]

A container, as defined in 40 CFR 260.10, is any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled. The MWF accepts waste materials in a variety of containers appropriate for the physical matrix of the waste. Containers received by the MWF for treatment, storage, transfer, or packaging of dangerous or mixed waste comply with the US Department of Transportation (DOT) regulations 49 CFR Part 173 – General Requirements for Shipments and Packagings, Part 178 – Specifications for Packagings, Part 179 – Specifications for Tank Cars and Part 180 – Continuing Qualification and Maintenance for Packagings, as applicable.

4.1.1.1 Waste Types Stored in Containers

Types of waste that may be stored in containers at the MWF are the types of waste listed in the facility's Part A application including PCBs. The type of container in which each type of waste will be stored depends on the physical attributes, chemical properties and volume of the waste. A chemical resistance guide is used for the selection of containers to ensure that the waste placed in the container is compatible with the container material. See Attachment 4-5 for an example of a chemical resistance guide.

4.1.1.2 Container Types

Container types that are received and used include, but are not limited to: small containers (e.g. carboys, bottles, pails and buckets less than 5 gallons), drums (most typically 55-gallon), intermediate bulk containers (IBCs) also referred to as totes, B-25 boxes and International Standards Organization (ISO) shipping containers, large boxes, or equivalents. Bulk containers such as tankers, roll-offs and dump trailers are also received at the facility. Other types of containers are accepted if they meet the DOT 49 CFR 173 (General Requirements for Shipments and Packagings) specifications and are compatible with the MWF systems. Table 4-1 lists typical waste container types and volumes that are received and used by the MWF. Variations of the listed capacities and other containers are also acceptable to the MWF if they are in compliance with DOT packaging specifications.

Table 4-1. Typical Waste Container Types: Volumes and Dimensions

Container Type	Typical Volumes and Approximate Dimensions
Small Containers (carboys, bottles, pails, buckets)	Up to 5 gallons
Drums	Up to 119 gallons (typically 55 gallons – 23 inch diameter x 35 inch height)
IBC (totes)	Between 55 and 550 gallons (typically 275 gallons or 330 gallons - width, height and length dimensions are each typically between 3 ft to 4 ft)
B-25 Box	Typically 96 ft^3 – 4 ft x 4 ft x 6 ft
ISO Shipping Container	1169 ft^3 - 8 ft width x 8 ft height x 20 ft length 2385 ft^3 - 8 ft width x 8 ft height x 40 ft length
Large Box	Up to 100 cubic meter (3,532 ft^3)capacity – approx. 12.7 ft wide x 40 ft
Bulk Solid	Rolloff – up to 40 cubic yards Dump trailer – up to 40 cubic yards
Bulk Liquid	Tanker – up to 6,000 gallons

4.1.1.3 Construction Materials

Construction materials for containers will be acceptable if they meet DOT specifications in 49 CFR 178 through 180. Waste containers must be constructed of materials that will not react with, and will otherwise be compatible with, the dangerous and mixed wasted placed in the container. The most typical materials used for container construction are steel, stainless steel, polyethylene, or high density polyethylene.

4.1.1.4 Liner Materials

Should liners be needed in any container, the construction materials for container liners will be acceptable if they meet DOT specifications in 49 CFR 178. Liners must be constructed of materials that will not react with, and will otherwise be compatible with, the dangerous and mixed wasted placed in the container. The most typical materials used for container liners are polyethylene, epoxy resins, or Teflon. Polyethylene drum liners will be acceptable for most of the liquid and non-liquid wastes processed at the facility.

4.1.1.5 Container Specifications

Containers of mixed waste received must meet the performance specifications for composition, integrity, and compatibility of the DOT regulations 49 CFR 173 and 49 CFR 178 through 180. Containers for storage of wastes containing TSCA-regulated PCBs also must conform to the specifications of 40 CFR 761.65.

4.1.1.6 *Empty Containers and Overpack Drums*

An inventory of empty containers and overpack drums will be kept on site for packaging of treated waste; for repackaging of waste received in leaky, damaged, or otherwise unsuitable containers; and for repackaging prior to treatment. The number of empty drums and overpack containers maintained at the facility will fluctuate with the types of waste scheduled for storage and treatment at the facility. Table 4-2 provides an estimate of the number of empty containers and overpack containers kept on-site.

Table 4-2. Empty Container and Overpack Inventory

Empty Container / Overpack Type	Estimated Number in On-Site Inventory
Drum	5
Drum Overpack	20
B-25 Box	2
20-ft ISO	2

4.1.1.7 *Container Conditions*

The following practices are employed to ensure that containers used at the MWF are in good condition (e.g., no severe rusting or apparent structural defects).

Incoming Waste Container: If a container is received at the MWF that is not in good condition the container will be placed into an overpack or the contents will be transferred into a container in good condition. Waste compatibility with the material of construction of the overpack container or empty container will be determined before the leaking container or waste is transferred. Any waste that was released due to a leak will be cleaned up in accordance with the spill cleanup procedures listed in the MWF Contingency Plan.

Transportable In-Process Containers (TICs): Prior to each use, TICs will be visually inspected to verify that they are empty (as defined by WAC 173-303-160) and are in good condition. If a TIC is found to not be in good condition, it will be removed from service.

4.1.2 Container Management Practices [D-1b]

[WAC 173-303-630(5) and (8), WAC 173-303-340(3), 40 CFR 264.35, 40 CFR 264.173]

Container management practices for the MWF will be in compliance with the WAC 173-303-630. The following structures, equipment and operations will be provided and employed for staging, storage and management of waste containers. There are also MWF processes that treat waste inside containers. These in-container treatment systems are summarized in Table 4-3 and are described in detail in "Process Description Details" subsection. All treatment processes that take place in containers (listed below) are portable units.

Table 4-3. In-Container Treatment Systems

System Designation	System Description	Number of Containers	Container Nominal Capacity (Each)	Container Use (Storage or Treatment)
TP-14 Liquid Treatment	Totes and ancillary equipment	Four	180 to 550 gallons	Temporary storage and treatment
TP-07 Compaction and Macroencapsulation	In-drum compactor assembly	One container per batch	Up to 110 gallons	Temporary storage and treatment
TP-10 Extraction Mixing	Mixer units and ancillary equipment	Two	Approx. 100 gallons	Treatment
TT-03 In-Container Mixer	In-container mixer assembly	One container per batch	Up to 110 gallons	Temporary storage and treatment
TT-03 In-Container Mixer	In-container drum roller assembly	One container per batch	Up to 110 gallons	Temporary storage and treatment
TT-09 Mercury Amalgamation	Various containers for bench scale amalgamation	Various	Up to 5 gallons	Treatment
TT-09 Mercury Amalgamation	Bulk scale amalgamation mixer	One	Approx. 100 gallons	Treatment
TT-10 Debris Washing	In-container debris washing assembly	One container per batch	Approx. 55 gallons	Temporary storage and treatment
TT-10 Debris Washing	Multi-Vat assembly	One container with three compartments for wash/rinse	Approx. 230 gallons	Treatment

4.1.2.1 Waste Addition and Removal from Containers

Waste containers are always kept closed during receipt, staging, and storage except when waste is sampled, added, or removed from a container. Waste addition and removal from containers will take place in an area, TCS, room, or process equipment that is ventilated by either the Non-Thermal Area process ventilation system or the Thermal Area process ventilation system. In addition to the process ventilation systems that may be used to collect any emissions from an open container, the building is kept at negative pressure relative to outside. Thus, any emissions from activities involving the addition or removal of waste from an open container are collected by either a process ventilation or building ventilation system.

4.1.2.2 Opening Containers

Containers are opened and closed in accordance with the manufacture's specification and in a manner that will not cause a rupture or leak. Tools used to open and close containers will be selected to minimize the potential for an upset condition. For example, non-sparking tools are used when opening a container holding flammable liquids. Before opening, each container will be examined for the following as applicable:

- Dents, nicks and bulges,
- Deformation of sealing surfaces,
- Continuity of welds or seams,
- Excessive rust and
- Gasket quality.

If upon examination, it is determined that it may be unsafe to open the container, a glove box may be used to open it or the container will be not be opened and will be placed into an overpack. Waste compatibility with the overpack container material will be determined before the container is placed inside.

4.1.2.3 Container Handling and Transport Procedures

The handling and transport procedures that will be used to move containers within the MWF have been selected to ensure that the containers are not damaged during transport. Waste handlers and equipment operators are trained in the proper operation of the equipment, in the management of containerized waste and in response to spill incidents.

Containers that are less than 10 gallons of liquid waste are generally moved using wheeled carts equipped with liquid tight basins. The basins provide secondary containment for liquids. Larger containers of liquid wastes are moved on pallets with built-in secondary containment by forklift trucks.

Movement on pallets minimizes the risk of dropping containers. Drums of liquid waste are also moved by drum carts with built-in secondary containment.

Drums and small containers of non-liquid containing waste are transported on pallets moved by forklift truck or by handcart. When drums need to be handled individually, a hand-truck drum dolly or forklift truck with a barrel grappler will be used. Bulk containers such as B-25 boxes, and IBCs are transported with a forklift truck. Roll-off bins, ISO cargo containers and other containers mounted on wheels are moved manually or using a forklift truck. Large bulk containers such as trailers and rolloffs are moved with the appropriate truck units. Occasionally overhead cranes are used to unload bulk containers.

If the original container is unsuitable for transport within the pre-treatment or treatment systems, the wastes will be transferred to TICs. For liquids, pumpable sludge and flowing powders (solids of small particle size) that can be easily airborne, closed-top drums of up to 85-gallon size or IBCs of up to 350-gallon size are generally used as TICs. For non-pumpable sludge and solids, open-top drums, small ISO cargo containers and B-25 boxes are generally used as TICs.

4.1.2.4 Containerized Waste Staging and Storage

The MWF is designed to safely receive, stage, store, and treat bulk and containerized mixed wastes and Toxic Substances Control Act (TSCA)-regulated Polychlorinated Biphenyl (PCB) wastes. The following areas, structures, equipment, operations, and management practices are provided and employed for staging and storage of waste containers and treatment of wastes. The information provided by generators for each waste stream will be added to the electronic waste tracking system and a barcode label that will be applied to the container. This label will be used for identifying and tracking the waste container through the MWF. As information is gained through on-site analysis of waste streams, it will be added to the electronic waste tracking system.

Yard Area: The Yard Area is inside the Radiological Controlled Area (RCA) and serves as a staging area for the incoming or outgoing trucks during container loading and unloading operations. Actual loading to or unloading from vehicles will take place on the Truck Loading Area (TLA) which is part of the Yard Area, or directly into Building 13. The Yard Area is used of staging only, not storage, of mixed wastes. Containers will not be staged more than 24 hours in the Yard Area. Typically, forklift trucks are used for loading, unloading, and transfer operations from the vehicles. Occasionally, overhead cranes are used to unload bulk containers. Liquid waste loading into Building 13 will occur in Room SB-03 only. Loading and unloading areas of SB-03 are also known as the Truck Bay. If any spills occur during loading/unloading loading operation, actions may include the removal of the spilled material and the execution of the subsequent remediation activities according to the procedures established by the Contingency Plan.

Containerized Waste Staging Area (Room SB-03): Containerized wastes are unloaded in the RLA, TLA or inside Building 13. Containers may be opened and visually inspected in Room SB-03 or in another location of the MWF as specified in the "Process Description Details" subsection of this document. Containers will not be opened in SB-03 without first establishing ventilation for the activity by use of a temporary enclosure and/or flexible connection to the Non-Thermal Area process ventilation system (SB-09). The bar code tracking system will be used to enter container and waste information into the facility's record management computer system. Occasionally, containers may be moved inside Room SB-03 by the overhead crane. Containers may remain in Room SB-03 for interim storage, be transported to another waste storage area for interim storage, or go directly to a treatment area for treatment.

When a container is scheduled for treatment, it is either moved directly to the designated treatment system or to an area for pre-sorting and transfer operations. Transfer operations may include removing the waste packing material, transferring waste from containers into transportable in-process container (TICs), or removing objects from a container and placing them in a TIC. When a transfer operation is complete, TICs containing wastes are sent to the designated treatment system. When final inspection and certification is completed, the treated waste containers are moved to a waste storage area until the container of waste is transported off-site for further treatment or disposal.

Containerized Bulk Waste Staging Area (Room SB-03): Bulk solid dangerous/TSCA-regulated waste containers [International Standards Organization (ISO) containers], boxes and intermediate bulk containers (IBCs) are off-loaded in RLA, TLA or Building 13 by forklift trucks. Containers may be opened and visually inspected here or later in another location of the MWF. See the "Non-Treatment Process Descriptions" subsection of this document. Containers will not be opened in Room SB-03 without first establishing ventilation for the activity by use of a temporary enclosure and / or flexible connection to the Non-Thermal Area process ventilation system.

The bar code tracking system will be used to enter container and waste information into the facility's record management computer system. Containers may remain in a staging area, are transported to a waste storage area for interim storage, or transported directly to a treatment area for treatment.

When a bulk container is scheduled for treatment, pre-sorting and transfer operations may be required. Transfer operations include removing waste objects from the container and transferring them to a TIC. When a transfer operation is complete, TICs containing wastes are sent to the designated treatment system. When final inspection and certification is completed, the treated waste containers are moved to a waste storage area until the container of waste is transported off-site for further treatment or disposal.

Waste Storage Area (Rooms WSB-01, WSB-02, WSB-03 and WSB-04): The Waste Storage Area is for the storage of containerized wastes. No pretreatment or treatment activities will take place in the Waste Storage Area. However, additional inspections and sampling may occur here as needed.

Railcar Containerized and Bulk Waste Staging Area: Containerized and bulk wastes on rail vehicles are unloaded on the RLA which is outside of the RCA. The RLA may also be used for staging, but not storage of wastes. After completion of the initial visual inspection, survey, and manifest or shipping document review, the shipment will be allowed to be transferred from the RLA into the RCA. Within 24 hours of entering the RCA, the shipment will be unloaded. Typically, forklift trucks are used for loading, unloading, and transfer operations from the rail vehicles. Occasionally, large bulky containers will be unloaded using a crane. If any spills occur during loading/unloading loading operation, actions may include the removal of the spilled material and the execution of the subsequent remediation activities according to the procedures established by the Contingency Plan.

When a container is scheduled for treatment, it is either moved directly to the designated treatment/pre-treatment system or to an area for pre-sorting and transfer operations. Transfer operations may include transferring waste from containers into transportable in-process container (TICs), or removing objects from a container and placing them in a TIC. When a transfer operation is complete, TICs containing wastes are sent to the designated treatment system in Building 13. When final inspection and certification is completed, the treated waste containers are moved to a waste storage area until the container of waste is transported off-site for further treatment or disposal.

4.1.2.5 Aisle Spacing

Container storage areas will provide aisle spacing of at least 30 inches between rows of waste containers in order to facilitate movement of emergency response personnel and equipment when required. Rows of drums will be no more than two drums wide.

4.1.2.6 Typical Container Storage Arrangement

[WAC 173-303-630(7)(a)(iii), 40 CFR 761.65(b)(1)(ii)]

The total volume of containers containing free-liquid waste that requires secondary containment will not exceed a volume of ten times the containment capacity (this allows for containment of 10% of the waste). The largest liquid container in each storage area will not exceed the containment capacity of the room. The total volume of containers containing TSCA-regulated waste will not exceed a volume of four times the containment capacity (this allows for containment of 25% of the waste). The largest liquid container of TSCA-regulated waste in each storage area will not exceed one-half of the containment capacity of the room (this allows for containment of at least two times the largest container).

The number of containers in each storage area will vary depending on the size of the containers. Typical container volumes that will be used to store mixed waste are listed in Table 4-1.

Containers will be stacked no more than three containers high. The rooms that will be used for containerized waste storage at the MWF are listed in Table 4-4. The types of wastes stored in the MWF are the wastes accepted by the facility, as listed in Part A of this application.

Table 4-4. Rooms Used for Waste* Storage in Building 13

SB-02	SB-03	SB-04	SB-05	SB-06	SB-07
SB-08	SB-09	SB-11	MWT-01	MWT-02	MWT-04
WSB-1	WSB-2	WSB-3	WSB-4		

*Includes TSCA-Regulated wastes.

Typical container storage layout for the waste storage rooms WSB-1, WSB-2, WSB-3 and WSB-4 is shown in drawings DWG-MW-GA-008 and DWG-MW-GA-007 Sheet 1. Referenced drawings are included in Section 12 unless otherwise noted. The actual container storage layout may differ from this typical layout on occasions depending upon the amount and types of containers reviewed at the facility. However, minimum aisle space of 30 inches will be retained and maximum storage amounts will not exceed the permitted amount.

4.1.2.7 *Exterior Loading and Unloading Area Containment*

The Truck Loading Area (TLA) and Rail Loading Area (RLA) are curbed concrete structures designed and built to meet the containment requirements of WAC 173-303-395(4) and 40 CFR 761.65(b)(1)(ii). The design and containment calculations for the loading and unloading areas are shown on drawings 100707-M-100 and 100707-M-101. As-built drawings of the TLA and RLA are included (drawing 100707-S-101, and 100707-S-100, respectively). The certification package for the TLA and RLA are included as Attachment 4-11. These concrete pads will contain spills or leaks that might occur from loading or unloading. Each pad is curbed to provide enough volume to capture 15,710 gallons. Containment calculations are based on a liquid container holding 3,000 gallons and providing containment volume equal to at least two times the internal volume of the largest PCB container. The pads are coated with an NSP 100 (or equivalent) coating and sloped to a collection point that will allow for the collection and removal of collected wastes resulting from spills or leaks in a manner that will prevent the release of dangerous waste and waste constituents to ground or surface waters. The TLA and RLA will be inspected according to the schedule specified in the Inspection Plan (Section 6.2). Any accumulated liquid greater than the one (1) inch mark on the containment wall shall be removed. Accumulated liquids from rainfall or precipitation will be inspected for the presence of an oily sheen. Liquids with an oily sheen shall be removed from the containment system and characterized for disposal. Liquids removed that do not have an oily sheen will be sampled for radioactive components and verified that the results are less than the "investigation and Action Levels" for Environmental Water shown in Low-level Operating Procedure 217 Environmental Data Review and Reporting prior to discharging the liquid to the ground. Any accumulated liquids with sample results that are greater than or equal to the "Investigation and Action Levels" for Environmental Water in Low-Level Operating Procedure 217 will be characterized for disposal.

4.1.3 Container Labeling and Marking [D-1c]

[WAC-173-303-806(4)(b)(iii), 173-303-395(6), 173-303-630(3)]

All waste containers received and shipped at the MWF will be marked and labeled in accordance with the requirements specified under DOT regulations 49 CFR 172. Affixing shipping labels to containers received at the MWF is the responsibility of the generator. Affixing DOT labels to waste shipped from the MWF is the responsibility of the MWF. While at the facility, containers will be marked and/or labeled as required to adequately identify the major risks of the contents as required. Containers holding TSCA-regulated PCBs will be labeled in accordance with the marking requirements referenced in 40 CFR 761.40. There will also be a waste tracking label that will allow the waste to be identified in the facility's electronic tracking system. The labels and marking will be generally affixed to the sides of the containers and will include the date the waste was received. The labels will also contain information required by the US EPA and the Department of Ecology (e.g. WAC 173-303-630(3)).

Upon transfer of waste from one container to another, new labels will be generated and placed on the new container. Old labels will be destroyed by removing the label from the container or it will be made non-legible. The following practices are employed to ensure that containers managed at the MWF are labeled in a manner which identifies the major risk(s) associated with the contents of the containers.

In-coming waste container: As part of the acceptance process, in-coming containers are inspected for the appropriate labeling.

TICs: TICs are labeled to identify the major risk(s) associated with the contents of the TIC. Any old or inappropriate labels or marking on the TIC will be removed or otherwise made unreadable.

Out-going waste container: Out-going containers will be marked/labeled in accordance with WAC 173-303-190.

4.1.4 Containment Requirements for Storing Containers [D-1d]

Secondary containment is required for storage areas in which containers hold free liquids. Secondary containment is also required for wastes with the waste code designations of F020, F021, F022, F023, F026 or F027. However, wastes with these designated waste codes are not accepted by the MWF. In addition, secondary containment is required for wastes containing TSCA-regulated PCB wastes. The following subsections describe the design and function of the secondary containment systems at the MWF.

4.1.4.1 Secondary Containment System Design [D-1d(1)]

[WAC-173-303-806(4)(b)(i) and (iv), WAC-173-303-630(7), 40 CFR 270.15(a), 40 CFR 264.175(a), (b) and (d)]

Secondary containment for stored containers, tanks and miscellaneous units in the MWF is provided by a base with a curbed and sloped floor. All storage areas are located indoors and have secondary containment capable of collecting and retaining spills or leaks, if they should occur.

4.1.4.1.1 System Design [D-1d(1)(a)]

[WAC-173-303-806(4)(b)(i), WAC-173-303-630(7) (a) and (d), 40 CFR 270.15(a), 40 CFR 264.175(b)]

There is a continuous building curb around the combined Thermal and Non-Thermal areas. There is also a curb that divides the Thermal and Non-Thermal Areas from each other. Therefore, the Thermal and Non-Thermal Areas are each surrounded by a continuous curb. Another continuous curb surrounds the remainder of the MWF building which includes rooms WSB-01, WSB-2, WSB-03, WSB-04, and SB-03. There are also additional curbs within these building areas that define individual rooms of WSB-1, WSB-2 and WSB-3.

Floors of the MWF are constructed entirely of reinforced concrete with a minimum slope of at least 1% toward the low point of the floor. The floor slabs of Building 13 are divided into several rectangular sections, each section is sloped to the center of the rectangle. If any liquids are released, they will flow to the center of the rectangle. Other containment areas may slope to one wall or sump so that any released liquid are collected in one defined area. Generally, the MWF Building 13 curbing and sloped floors are depicted in drawing DWG-MW-STRUC-001. The curbed secondary containment is augmented by metal cabinets used for the storage of wastes designated as ignitable, corrosive, or reactive (with waste codes D001, D002 and D003, respectively) located inside SB-02 and WSB-04. Design and construction details of the cabinets are shown on drawings DWG-MW-GA-007 Sheet 2 and DWG-STB-GA-SB02-002. The typical location of the storage cabinets within SB-02 and WSB-04 are indicated on drawing DWG-STB-GA-SB02-002 and DWG-MW-GA-007 Sheet 1, respectively. Self-contained pellets may also be used in storage areas to segregate ignitable, corrosive or reactive wastes.

There are no openings in the MWF building secondary containment curbs on any sides of the building. At personnel entries there is either a ramp or steps from the building floor to allow exit from the door or entry way. Entryways and roll-up doors for material handling equipment have sloped ramps that allow carts, forklift trucks, equipment and containers to cross the curb at the given door or entrance.

The areas around the MWF buildings are graded to promote drainage away from the building and to protect from run-on. See drawing DWG-SITE-CIVIL-003. All storage areas are located inside the enclosed, roofed Building 13. Drainage from the sloped roofs of the MWF building is directed away from the building to prevent run-on.

For Building 13, chemical-resistant water-stops made of polyvinyl chloride or rubber (or equivalent) were used underneath all expansion joints. Joints were sealed with a heat-resistant silicone sealant (or equivalent). This ensured the floors were constructed free of cracks or gaps. The floors of Non-Thermal Area (Rooms SB-02, SB-04 through SB-09 and SB-11), Thermal Area (Rooms MWT-01, MWT-02 and MWT-04) and the Storage Area (Rooms WSB-01 through WSB-04 and SB-03) are sealed with a coating to prevent infiltration of any waste that may be released. Manufacturer information indicates the floor coating is compatible with materials with typical waste codes accepted by the MWF. However, some special precautions will be required when processing strong acids. The special precautions include thorough flushing of the floor after exposure to a spill of certain acids. Information about the chemical resistance and chemical compatibility of the floor sealants from the manufacturer is included as Attachment 4-1.

See the following drawings for joint and coating details: DWG-MW-STRUC-001 Sheet 2, 31001-S-001-S101, 31001-S-001-S102, 31001-S-004-S402.

4.1.4.1.2 Structural Integrity of Base [D-1d(1)(b)]

[WAC-173-303-806(4)(b)(i), WAC-173-303-630(7)(a), 40 CFR 270.15(a), 40 CFR 264.175(b)]

The Building 13 base is designed to adequately support MWF operations. Foundation adequacy calculations are kept at the facility and are included as Attachment 4-2. As described in the construction notes on drawing 31001-S-001, to prevent uneven settling, the foundation and footing design, excavation, engineering backfill and subgrade compaction for Building 13 was based upon geotechnical studies and soil report recommendations. The bottom of all footings were constructed on native, inorganic, undisturbed soil or engineering backfill at a minimum of two feet below existing grade. Some sections of the foundation were installed on top of an existing floor. The existing concrete slab was cleaned and repaired, and then new reinforced concrete was poured on top.

4.1.4.1.3 Containment System Capacity [D-1d(1)(c)]

[WAC-173-303-806(4)(b)(i)(A) and (C), WAC-173-303-630(7)(a), 40 CFR 270.15(a)(3), 40 CFR 264.175(b)(3)]

Secondary containment capacity calculations for rooms WSB-1, WSB-2, WSB-3, WSB-4 and SB-03 are based on an eight-inch high curb and ignore the additional volume created by the downward slopes of the floor. To be conservative, the secondary containment capacity calculations for all remaining storage areas assume a six-inch curb and also ignore the additional volume created by the downward slopes of the floor. The secondary containment volume calculations assume all floors were flat. The room dimension information is from facility as-built drawings. All storage areas are covered, therefore the volume of rainfall events was not considered for determining adequacy of secondary containment capacity. There is no sprinkler system in the MWF, therefore no additional containment is required for sprinkler system water and is not considered in the containment capacity calculations. All room floor area measurements are inside-curb to inside-curb dimensions.

The secondary containment volume and corresponding storage capacity is calculated separately for rooms WSB-1, WSB-2 and WSB-3 because the doors to each of these four rooms are kept closed except for when containers are being added or removed from these rooms. The containment capacity of combined areas of WSB-4 and SB-03 are calculated separately because an independent curb surrounds this area. In addition, the containment capacity of the Non-Thermal and Thermal Areas of Building 13 are calculated independent from each other, as there is a curb that completely surrounds these two areas separately. See drawing DWG-MW-GA-001.

For all volume displacement calculations:

It was assumed that ISO, B-25 Boxes, and IBC containers do not have the entire area of the bottom of the container in contact with the floor. The bottoms of these container types are elevated from the containment floor. To be conservative, it was assumed that the support features occupied 50% of the volume underneath the footprint of the container. The actual number and combination of container types will vary depending on the types of wastes and containers present at the facility at any given time. All containers in the calculations below can be described as "container equivalents." The arrangement of typical containers used for the calculations represents a "worst case" scenario of the most volume of waste that can be stored with the smallest amount of void space per container. Using the box-like containers in displacement calculations is more conservative than using drum equivalents as shown in Table 4-5.

Table 4-5. Containment Volume Displacement

Container Type	Length (ft)	Width (ft)	Effective Footprint	Curb Height (ft)	Containment Volume Displaced (ft^3)	Maximum Amount Stored in Container (ft^3)
20' ISO	20	8	50%	0.5	40	1169
				0.667	53.33	1169
40' ISO	40	8	50%	0.5	80	2385
				0.667	106.67	2385
6' x 4' B-25	6	4	50%	0.5	6	96
				0.667	8	96
4' x 4' IBC	4	4	50%	0.5	4	64
				0.667	5.33	64
Pallet	4	4		0.5	2.08	29.4 (220 gal)
				0.667	4	29.4 (220 gal)

Volume displaced by a pallet with dimensions 48" x 48" x 6"

Top deck volume: 48" x 48" x 0.5" = 1152 in^3

Middle vertical supports volume: 3 x 2" x 6" x 48" = 1,728 in^3

Bottom supports volume: 5 x 48" x 6" x 0.5" = 720 in^3

Total pallet volume: 1,152 + 1,728 + 720 = 3,600 in^3 = 2.083 ft^3

For pallet in 8" curb area, add 2" of displacement by drums on top of pallet

4 drums on top of pallet, each drum has an approximate diameter of 23"

4 x (3.14 x (23"/2)^2) x 2" = 3,322 in^3

Total pallet volume displacement = 3,600 in^3 + 3,322 in^3 = 6,922 in^3 = 4 ft^3

For volume displaced by storage cabinets:

The HAZMAT storage cabinets in Rooms WSB-4 and SB-02 are supported on legs that raise the bottom of the cabinet above the floor. However, the height of these support legs is less than six inches. Therefore to be conservative it will be assumed that the entire footprint of the storage cabinets (and enclosed pallets) displaces volume from the secondary containment (i.e. 100% effective footprint). It should be noted that each of the cabinets and enclosed pallets has its own sump capacity to contain any spills or leaks. To be more conservative, this sump capacity has not been included in the containment calculations. Cabinet dimensions are shown on drawing DWG-MW-GA-007, sheet 2.

<u>Building 13</u>

Room WSB-1 Secondary Containment Capacity:

Gross Containment Capacity: 89.75 ft x 50 ft x 0.667 ft high curb = 2,993 ft^3

Volume displaced by two ramp areas: 2 x 6 ft wide x (1/2) x 4 ft base x 0.667 ft high curb = 16 ft^3

Volume displaced by two step up to door areas: 2 x 3 ft x 5 ft x 0.667 ft high curb = 20 ft^3

Containment volume displaced by containers:

Volume displaced by two 40' ISO containers: 2 x 106.67 ft^3 = 213.44 ft^3

Volume displaced by 44 B-25 containers: 44 x 8 ft^3 = 352 ft^3

Volume displaced by 28 IBC containers: 28 x 5.33 ft^3 = 149.41 ft^3

Total volume displaced by containers: 213.4 ft^3 + 352 ft^3 + 149.4 = 715 ft^3

Total containment capacity: 2,993 ft^3 – (16 ft^3 + 20 ft^3 + 715 ft^3) = 2,242 ft^3

If waste stored does not contain TCSA-regulated PCBs, required containment is 10% of waste volume or the volume of largest liquid container, whichever is greater. Largest liquid container will be an IBC tote (or equivalent) with a capacity of 74 ft^3. Requested waste storage capacity for room WSB-1 is 22,076 ft^3.

> 10% of 22,076 ft^3 = 2,208 ft^3
>
> Containment capacity of 2,242 ft^3 is greater than 2,208 ft^3 and largest container.

If waste stored does contain TSCA-regulated PCBs, required containment is 25% of waste volume or two times the volume of the largest container, whichever is greater. Largest liquid container will be an IBC tote (or equivalent) with a capacity of 74 ft^3. 74 ft^3 x 2 = 148 ft^3. The requested PCB-containing waste storage capacity for WSB-1 is 8,800 ft^3.

> 25% of 8,800 ft^3 = 2,200 ft^3
>
> Containment capacity of 2,242 ft^3 is greater than 2,200 ft^3 and two times the largest container capacity.

Room WSB-2 Secondary Containment Capacity:

Gross Containment Capacity: 89.75 ft x 46.43 ft x 0.667 ft high curb = 2,779 ft^3

Volume displaced by one ramp area: 6 ft wide x (1/2) x 4 ft base x 0.667 ft high curb = 8 ft^3

Volume displaced by one step up to door area: 3 ft x 5 ft x 0.667 ft high curb = 10 ft^3

Containment volume displaced by containers:

Volume displaced by 100 B-25 containers: 100 x 8 ft^3 = 800 ft^3

Total containment capacity: 2,779 ft^3 – (8 ft^3 + 10 ft^3 + 800 ft^3) = 1,961 ft^3

If waste stored does not contain TSCA-regulated PCBs, required containment is 10% of waste volume and volume of largest container. Largest liquid container will be an IBC tote (or equivalent) with a capacity of 74 ft^3. Requested waste storage capacity for room WSB-2 is 19,200 ft^3.

10% of 19,200 ft^3 = 1,920 ft^3

Containment capacity of 1961 ft^3 is greater than 1,920 ft^3 and largest container.

If waste stored does contain TSCA-regulated PCBs, required containment is 25% of waste volume and two times the volume of the largest container. Largest liquid container will be a IBC tote (or equivalent) with a capacity of 74 ft^3. 74 ft^3 x 2 = 148 ft^3. The requested PCB-containing waste storage capacity for WSB-2 is 7,800 ft^3.

25% of 7,800 ft^3 = 1,950 ft^3

Containment capacity of 1,961 ft^3 is greater than 1,950 ft^3 and two times largest container.

Room WSB-3 Secondary Containment Capacity:

Gross Containment Capacity: 89.75 ft x 46.43 ft x 0.667 ft high curb = 2,779 ft^3

Volume displaced by one ramp area: 6 ft wide x (1/2) x 4 ft base x 0.667 ft high curb = 8 ft^3

Volume displaced by one step up to door area: 3 ft x 5 ft x 0.667 ft high curb = 10 ft^3

Containment volume displaced by containers:

Volume displaced by 100 B-25 containers: 100 x 8 ft^3 = 800 ft^3

Total containment capacity: 2,779 ft^3 – (8 ft^3 + 10 ft^3 + 800 ft^3) = 1,961 ft^3

If waste stored does not contain TSCA-regulated PCBs, required containment is 10% of waste volume and volume of largest container. Largest liquid container will be an IBC tote (or equivalent) with a capacity of 74 ft^3. Requested waste storage capacity for room WSB-3 is 19,200 ft^3.

10% of 19200 ft^3 = 1,920 ft^3

Containment capacity of 1,961 ft^3 is greater than 1,920 ft^3 and largest container.

If waste stored does contain TSCA-regulated PCBs, required containment is 25% of waste volume and two times the volume of the largest container. Largest liquid container will be an IBC tote (or equivalent) with a capacity of 74 ft^3. 74 ft^3 x 2 = 148 ft^3. The requested PCB-containing waste storage capacity for WSB-3 is 7,800 ft^3.

25% of 7,800 ft^3 = 1,950 ft^3

Containment capacity of 1,961 ft^3 is greater than 1,950 ft^3 and two times largest container.

Room WSB-4 and SB-03 Secondary Containment Capacity:

Room WSB-4

Gross Containment Capacity: 103.07 ft x 67.15 ft x 0.667 ft high curb = 4,616 ft^3

Volume displaced by one ramp area: 6 ft wide x (1/2) x 4 ft base x 0.667 ft high curb = 8 ft^3

Volume displaced by two steps up to door areas: 2 x 3 ft x 5 ft x 0.667 ft high curb = 20 ft^3

Containment volume displaced by containers:

Volume displaced by seven enclosed pallets: 7 x 5 ft x 4.67 ft x 0.667 ft = 109 ft^3

Volume displaced by two cabinets (type 0017): 2 x 12.83 x 4.58 x 0.667 ft^3 = 78.4 ft^3

Volume displaced by two cabinets (type 0002): 2 x 21.17 x 11.6 x 0.667 ft^3 = 327.6 ft^3

Volume displaced by two cabinets (type 0015): 2 x 12.83 x 8.53 x 0.667 ft^3 = 146 ft^3

Volume displaced by two cabinets (type 0003): 2 x 22.25 x 4.58 x 0.667ft^3 = 136 ft^3

Volume displaced by two cabinets (type 0013): 2 x 13.58 x 4.58 x 0.667 ft^3 = 83 ft^3

Volume displaced by 65 B-25 containers: 65 x 8 ft^3 = 520 ft^3

Total volume displaced by containers: 109 ft^3 + 78.4 ft^3 + 327.6 ft^3 + 146 ft^3 + 136 ft^3 + 83 ft^3 + 520 ft^3 = 1,400 ft^3

Room WSB-4 total containment capacity: 4,616 ft^3 – 8 ft^3 - 20 ft^3 - 1,400 ft^3 = 3,188 ft^3

Room SB-03

Gross Containment Capacity: [(273.3 ft x 24.25 ft) + (76.75 ft x 45 ft) + (54.29 ft x 44.5 ft)] x 0.667 ft curb = 8,336 ft^3

Volume displaced by ramps and steps:

[9 ramps x 6 ft wide x (½) x 4 ft x 0.667 ft] + [4 ramps x 12 ft wide x (½) x 4 ft x 0.667 ft] + [10 steps x 3 ft x 5 ft x 0.667 ft] = 236 ft^3

Containment volume displaced by containers:

Volume displaced by fourteen 20' ISO Boxes: 14 x 53.33 ft^3 = 747 ft^3

Volume displaced by 45 B-25 containers: 45 x 8 ft^3 = 360 ft^3

Total volume displaced by containers: 747 ft^3 + 360 ft^3 = 1107 ft^3

Room SB-03 total containment capacity: 8,336 ft^3 – 236 ft^3 - 1107 ft^3 = 6,993 ft^3

Total Containment Capacity for WSB-4 and SB-03 = 3,188 ft^3 + 6,993 ft^3 = 10,181 ft^3

If waste stored does not contain TSCA-regulated PCBs, required containment is 10% of waste volume and volume of largest container. Largest liquid container will be a IBC tote (or equivalent) with a capacity of 74 ft^3. Requested waste storage capacity for room WSB-4 and SB-03 combined is 48,050 ft^3.

10% of 48,050 ft^3 = 4,805 ft^3

Containment capacity of 10,181 ft^3 is greater than 4,805 ft^3 and largest container.

If waste stored does contain TSCA-regulated PCBs, required containment is 25% of waste volume and two times the volume of the largest container. Largest liquid container will be a IBC tote (or equivalent) with a capacity of 74 ft^3. 74 ft^3 x 2 = 148 ft^3. The requested PCB-containing waste storage capacity for WSB-4 and SB-03 is 40,700 ft^3.

25% of 40,700 ft^3 = 10,175 ft^3

Containment capacity of 10,181 ft^3 is greater than 10,175 ft^3 and two times largest container.

The secondary containment volume and corresponding storage capacity for the remainder of Building 13 where storage is going to occur is divided into two areas; Non-Thermal Area (Rooms SB-02, SB-04 through SB-09 and SB-11) and the Thermal Area (Rooms MWT-01, MWT-02 and MWT-04). This is because the doors between each of these rooms are kept open and the doors to the outside are kept closed except for when containers are being added or removed through these doors. The curb that surrounds the entire Building 13 provides containment for the entire building. In addition, there is curbing that surrounds the Non-Thermal Area and curbing that surrounds the Thermal Area. Secondary containment calculations are based on curbing height of at least six inches.

Non-Thermal Area Secondary Containment Capacity:

Non-Thermal Area room volumes with six inch curb:

Room SB-02: [(82.36 ft x 49.25 ft) - (area occupied by Rooms SB-04 & SB-05 inside SB-02: 37.14 ft x 20 ft) – (area occupied by cabinets: 4 x 11.67 ft x 4.583 ft)] x 0.5 high curb = 1,549.7 ft^3

Room SB-02 volume displaced by ramps:

[3 ramps x 6 ft x (½) x 4 ft x 0.5 ft] = 18 ft^3

Room SB-02 subtotal: 1,549.7 ft^3 – 18 ft^3 = 1,531.7 ft^3

Room SB-04: [(37.14 ft x 11.43 ft) + (14.28 ft x 8.57 ft)] x 0.5 high curb = 273.4 ft^3

No ramp or step volumes to subtract

Room SB-05: 22.86 ft x 8.57 ft x 0.5 high curb = 98 ft^3

No ramp or step volumes to subtract

Room SB-06: [(59.25 ft x 49.25 ft) - (area occupied by stairwell Room SB-01: 25 ft x 11.4 ft)] x 0.5 high curb = 1,316.5 ft^3

Room SB-06 volume displaced by ramps:

[2 ramps x 6 ft x (½) x 4 ft x 0.5 ft] = 12 ft^3

Room SB-06 subtotal: 1,316.5 ft^3 – 12 ft^3 = 1,304.5 ft^3

Room SB-07: 99.25 ft x 48.5 ft x 0.5 high curb = 2406.8 ft^3

Room SB-07 volume displaced by ramps:

[1 ramp x 6 ft x (½) x 4 ft x 0.5 ft] = 6 ft^3

Room SB-07 subtotal: 2,406.8 ft^3 – 6 ft^3 = 2,400.8 ft^3

Room SB-08: 99.25 ft x 48.25 ft x 0.5 high curb = 2,394.4 ft^3

Room SB-08 volume displaced by ramps:

[2 ramp x 6 ft x (½) x 4 ft x 0.5 ft] = 12 ft^3

Room SB-08 subtotal: 2,394.4 ft^3 – 12 ft^3 = 2382.4 ft^3

Room SB-09: 41.25 ft x 24 ft x 0.5 high curb = 495 ft^3

Room SB-09 volume displaced by ramps:

[2 ramp x 6 ft x (½) x 4 ft x 0.5 ft] = 12 ft^3

Room SB-09 subtotal: 495 ft^3 – 12 ft^3 = 483 ft^3

Room SB-11: 41.25 ft x 23.75 ft x 0.5 high curb = 489.8 ft^3

Room SB-11 volume displaced by ramps and steps:

[2 ramps x 6 ft x (½) x 4 ft x 0.5 ft] + [1 steps x 3 ft x 5 ft 0.5 ft] = 19.5 ft^3

Room SB-11 subtotal: 489.8 ft^3 – 19.5 ft^3 = 470.3 ft^3

Sum of room subtotals: 8,944 ft^3

Room SB-02 subtotal = 1,531.7 ft^3

Room SB-04 subtotal = 273.4 ft^3

Room SB-05 subtotal = 98 ft^3

Room SB-06 subtotal = 1,304.5 ft^3

Room SB-07 subtotal = 2,400.8 ft^3

Room SB-08 subtotal = 2,382.4 ft^3

Room SB-09 subtotal = 483 ft^3

Room SB-11 subtotal = 470.3 ft^3

Volume displaced in rooms by immobile equipment was estimated by assuming 100% displacement volume under an effective footprint of the equipment. This is a conservative approach as most of the equipment is supported by legs and does not have full contact with the floor. In addition, most equipment has a containment pan beneath the equipment to contain any spill or leaks from the equipment or waste in the equipment. These pans have been ignored for the purpose of these calculations. Details are included in the Equipment Footprint Calculations Attachment 4-3.

Sum of containment volume displaced by mounted equipment in Non-Thermal Area: 546 ft^3

Volume displaced by Super Compactor (TP-07): 285.3 ft^3

Volume displaced by Low Capacity Mixer (TT-02): 82 ft^3

Volume displaced by baghouse area in SB-04: 18.4 ft^3

Volume displaced by Screen / Shredder (TP-01): 112.25 ft^3

Volume displaced by inspection table in SB-05: 48.5 ft^3

Volume displaced by four cabinets in SB-02: 4 x 11.65 x 4.58 x 0.5 ft^3 = 106.7 ft^3

There is also portable equipment that may be moved to various locations within Building 13. It was assumed that these portable units are mounted on some type of skid that is at least six inches high displaces a volume of 50% effective footprint of the equipment. This is a conservative approach as the skid mountings will occupy less that 50% of the equipment footprint. It was assumed all portable equipment would be in the Non-Thermal Area for purposes of secondary containment calculations.

Sum of containment volume displaced by portable equipment: 227 ft^3

Volume displaced by two Cutting Tables (TP-02): 17.1 ft^3

Volume displaced by sorting glove box (TP-13): 15.3 ft^3

Volume displaced by two sorting tables (TP-13) 17.1 ft^3

Volume displaced by four Liquid Treatment Totes (TP-14): 24 ft^3

Volume displaced by In-Drum Compactor (TP-07): 2.5 ft^3

Volume displaced by two Extraction Mixers (TP-10): 18.6 ft^3

Volume displaced by High Capacity Mixer (TT-01): 41 ft^3

Volume displaced by In-Container Mixer (TT-03): 24.4 ft^3

Volume displaced by Drum Roller (TT-03): 4.5 ft^3

Volume displaced by Abrasive Blasting (TT-05): 25 ft^3

Volume displaced by Amalgamation Bench Scale – small glove box (TT-09): 2 ft^3

Volume displaced by Amalgamation Bulk Scale – mixer (TT-09): 7.5 ft^3

Volume displaced by Debris Wash In-Container (TT-10): 15 ft^3

Volume displaced by Debris Wash in Multi-Compartment Vat (TT-10): 12.9 ft^3

The requested storage capacity for the Non-Thermal Area in Building 13 of 34,392 cubic feet of solids and liquids (excluding storage capacity of WSB-1, WSB-2, WSB-3, WSB-4 and SB-03 and the Thermal Area as these rooms' capacities are discussed separately).

Volume displaced by 180 B-25 containers: 180 x 6 ft x 4 ft x 0.5 ft curb x 50% footprint = 1,080 ft^3

Total available secondary containment capacity:

= [Non-Thermal room volumes] – (volume displaced by immobile equipment) – (volume displaced by portable equipment) – (volume displaced by storage container equivalents)

= 8,944 ft^3 - 546 ft^3 - 227 ft^3 – 1,080 ft^3

= 7,091 ft^3

If waste stored does not contain TSCA-regulated PCBs, required containment is 10% of waste volume and volume of largest container. The largest liquid container will be a 100 cubic meter box (or equivalent) with a capacity of 3,532 ft^3.

10% of 34,392 ft^3 = 3,439 ft^3

Containment capacity of 7,091 ft^3 is greater than 3,439 ft^3 and largest liquid container.

If waste stored does contain TSCA-regulated PCBs, required containment is 25% of waste volume and two times the volume of the largest container. Largest container will be a 100 cubic meter box (or equivalent) with a capacity of 3,532 ft^3. 3,532 ft^3 x 2 = 7,064 ft^3. The requested PCB-containing waste storage capacity for the Non-Thermal Area is 26,500 ft^3.

25% of 26,500 ft^3 = 6,625 ft^3

Containment capacity of 7,091ft^3 is greater than 6,625 ft^3 and two times largest liquid container.

Thermal Area Secondary Containment Capacity:

Thermal Area room volumes with six inch curb:

Room MWT-01: [(146 ft x 50.25 ft) - (area occupied by electrical room inside MWT-01: 41.4 ft x 20 ft) – (corner cut out of building 40 ft x 25 ft)] x 0.5 high curb = 2,754.25 ft^3

Room MWT-01 volume displaced by ramps and steps:

[1 ramps x 6 ft x (½) x 4 ft x 0.5 ft] + [2 steps x 3 ft x 5 ft 0.5 ft] = 21 ft^3

Room MWT-01 subtotal: 2,754.25 ft^3 – 21 ft^3 = 2,733.25 ft^3

Room MWT-02: 68.57 ft x 49.25 ft x 0.5 high curb = 1688.5 ft^3

Room MWT-02 volume displaced by ramps and steps:

[2 ramps x 6 ft x (½) x 4 ft x 0.5 ft] + [1 steps x 3 ft x 5 ft 0.5 ft] = 19.5 ft^3

Room MWT-02 subtotal: 1,688.5 ft^3 – 19.5 ft^3 = 1,669 ft^3

Room MWT-04: 39.25 ft x 49.25 ft x 0.5 high curb = 966.5 ft^3

Room MWT-04 volume displaced by ramps and steps:

[2 ramps x 6 ft x (½) x 4 ft x 0.5 ft] + [1 steps x 3 ft x 5 ft 0.5 ft] = 19.5 ft^3

Room MWT-04 subtotal: 966.5 ft^3 – 19.5 ft^3 = 947 ft^3

Sum of room subtotals: 5349 ft^3

Room MWT-01 subtotal = 2,733.25 ft^3

Room MWT-02 subtotal: = 1,669 ft^3

Room MWT-04 subtotal: = 947 ft^3

Volume displaced in rooms by immobile equipment was estimated by assuming 100% an effective footprint of the equipment. This is a conservative approach as most of the equipment is supported by legs and does not have full contact with the floor. In addition, most equipment has a containment pan beneath the equipment to contain any spill or leaks from the equipment or waste in the equipment. These pans have been ignored for the purpose of these calculations.

Sum of containment volume displaced by mounted equipment in Thermal Area[1]: 1,325.5 ft^3

Volume displaced by Thermal Desorber (TT-08): 140.2 ft^3

Volume displaced by Plasma Furnace (TT-07 NOT IN USE): 77.5 ft^3

Volume displaced by vitrification equipment in MWT-01 (NOT IN USE): 1,076ft^3

Volume displaced by three feed tanks in the Thermal Area: 31.8 ft^3 (removed from application, displacement kept for conservative calculations)

In addition, there is one tank and one tote in Room MWT-04. A 100% effective footprint was assumed for a total volume of 16.5 ft^3.

Volume displaced by Tank : 11.9 ft^3

Volume displaced by Tote : 4.6 ft^3

There is also portable equipment that may be moved to various locations within Building 13. It was assumed that these portable units are mounted on some type of skid that is at least six inches high and has a 50% effective footprint of the equipment. This is a conservative approach as the skid mountings will occupy less that 50% of the equipment footprint. It was assumed all portable equipment would be in the Thermal Area for purposes of secondary containment calculations.

Sum of containment volume displaced by portable equipment: 227 ft^3

Volume displaced by two Cutting Tables (TP-02): 17.1 ft^3

Volume displaced by sorting glove box (TP-13): 15.3 ft^3

Volume displaced by two sorting tables (TP-13) 17.1 ft^3

Volume displaced by four Liquid Treatment Totes (TP-14): 24 ft^3

Volume displaced by In-Drum Compactor (TP-07): 2.5 ft^3

Volume displaced by two Extraction Mixers (TP-10): 18.6 ft^3

Volume displaced by High Capacity Mixer (TT-01): 41 ft^3

Volume displaced by In-Container Mixer (TT-03): 24.4 ft^3

Volume displaced by Drum Roller (TT-03): 4.5 ft^3

Volume displaced by Abrasive Blasting (TT-05): 25 ft^3

Volume displaced by Amalgamation Bench Scale – small glove box (TT-09): 2 ft^3

Volume displaced by Amalgamation Bulk Scale – mixer (TT-09): 7.5 ft^3

Volume displaced by Debris Wash In-Container (TT-10): 15 ft^3

[1] Although the tote and Plasma Arc and Vitrification equipment is not in use, the containment volume displaced by these units was kept in the containment calculation for conservative results.

Volume displaced by Debris Wash in Multi-Compartment Vat (TT-10): 12.9 ft^3

Requested storage capacity for the Thermal Area of Building 13 of 19,968 cubic feet of solids and liquids (excluding storage capacity of WSB-1, WSB-2, WSB-3, WSB-4, SB-03 and the Non-Thermal Area as these rooms' capacities are discussed separately).

Volume displaced by 104 B-25 containers: 104 x 6 ft x 4 ft x 0.5 ft curb x 50% footprint = 624 ft^3

Total available secondary containment capacity:

= [Thermal Area room volume)] – (volume displaced by immobile equipment) – (volume displaced by portable equipment) – (volume displaced by tank/tote) - (volume displaced by container equivalents)

= 5,349 ft^3 - 1326 ft^3 - 227 ft^3 - 17 ft^3 - 624 ft^3
= 3,155 ft^3

If waste stored does not contain TSCA-regulated PCBs, required containment is 10% of waste volume and volume of largest container. The largest liquid container will be an IBC tote (or equivalent) with a capacity of 74 ft^3. The largest tank in the rooms will be a 1,000 gallon organic liquid collection tank with a capacity of 150ft^3. The requested storage capacity for the Thermal Area is 19,968 cubic feet of solids and liquids.

10% of 19,968 ft^3 = 1,997 ft^3

Containment capacity of 3,155 ft^3 is greater than 1,997 ft^3 and largest liquid container.

If waste stored does contain TSCA-regulated PCBs, required containment is 25% of waste volume and two times the volume of the largest container. Largest liquid container will be a IBC tote (or equivalent) with a capacity of 74 ft^3. 74 ft^3 x 2 = 148 ft^3. The largest tank in the rooms will be a 1,000 gallon tank with a capacity of 150 ft^3. 150 ft^3 x 2 = 300 ft^3. The requested PCB-containing waste storage capacity for the Thermal Area is 12,000 ft^3.

25% of 12,000 ft^3 = 3,000 ft^3

Containment capacity of 3,155 ft^3 is greater than 3,000 ft^3 and two times largest liquid container.

Requested storage capacities and demonstration of secondary containment adequacy for Building 13 is summarized in Table 4-6.

Table 4-6. Building 13 Storage and Containment Capacity Summary*

Area	Requested Waste Storage Capacity – Solids and Liquids (ft^3)	Requested Waste Storage Capacity if TSCA-Regulated PCB Waste (ft^3)**	10% of Requested Capacity (ft^3)	25% of Requested Capacity (ft^3)**	Secondary Containment Capacity (ft^3)	Containment Adequate at 10% (1x largest liquid container)	Containment Adequate at 25% (2x largest liquid container)**
Room WSB-1	22,076	8,800	2,208	2,200	2,242	yes	yes
Room WSB-2	19,200	7,800	1,920	1,950	1,961	yes	yes
Room WSB-3	19,200	7,800	1,920	1,950	1,961	yes	yes
Rooms WSB-4 and SB-03	48,050	40,700	4,805	10, 175	10,181	yes	yes
Non-Thermal Area	34,392	26,500	3,439	6,625	7,091	yes	yes
Thermal Area	19,968	12,000	1,997	3,000	3,155	yes	yes

*Secondary containment is required only if wastes contain free liquids or carry certain waste codes. The MWF does not accept these certain waste codes.
**For TSC-Regulated Wastes.

4.1.4.1.4 Control of Run-on [D-1d(1)(d)]

[WAC 173-303-806(4)(b)(i)(D), WAC 173-303-630(7)(b), 40 CFR 270.15(a)(4), 40 CFR 264.175(b)(4)]

As described in previously in this section, the areas around the MWF buildings are graded to promote drainage away from the building and to protect from run-on. See drawing DWG-SITE-CIVIL-003. All storage areas are located inside the enclosed, roofed Building 13. Drainage from the sloped roofs of the MWF building is directed away from the building to prevent run-on.

4.1.4.2 Removal of Liquids from Containment System [D-1d(2)]

[WAC 173-303-806(4)(b)(i)(E), WAC 173-303-630(7)(a)(ii), 40 CFR 270.15(a)(5), 40 CFR 264.175(b)(5)]

Spilled or leaked waste from collection areas will be removed as soon as possible after the spill or leak is detected. Small quantities of liquid wastes, less than approximately 100 gallons, will be removed by a hand pump or by using absorbents. Larger quantities of spilled liquids will be removed with electrically-driven pumps. These liquids will usually be managed on-site. If the history of the spill liquids is well known, the liquids will be returned to an appropriate processing unit within the MWF without testing. If the process history of the liquids is unknown, the liquids will be tested to determine whether or not they are suitable for processing within the MWF. Test parameters and methods used are described in the Waste Analysis Plan. If spilled liquids are unsuitable for processing within the MWF, they will be characterized and then shipped out of the facility to an appropriate treatment or disposal facility.

4.1.5 Demonstration that Containment Is Not Required Because Containers Do Not Contain Free Liquids, Wastes That Exhibit Ignitability or Reactivity, or Wastes Designated F020 - 023, F026, or F027 [D-1e]

[WAC 173-303-806(4)(b)(ii), WAC 173-303-630(7)(c), 40 CFR 270.15(b)(2), 40 CFR 264.175(c)]

No exemption from secondary containment requirements is being requested. Therefore, this subsection is not applicable.

4.1.6 Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes in Containers [D-1f]

Wastes designated as ignitable, reactive, or incompatible wastes in containers, if present, are stored in the hazardous materials storage cabinets located in Room SB-02 or the hazardous materials storage cabinets located in Room WSB-04. These storage cabinets are equipped with independent, internal fire-suppression system and are fire proof, explosion proof and heat resistant. These storage cabinets also have internal secondary containment to contain any spilled waste. The hazardous materials storage cabinets and associated fire suppression system are shown on drawings DWG-MW-GA-007 Sheet 2 and DWG-STB-GA-SB02-002.

4.1.6.1 Management of Reactive Wastes in Containers [D-1f(1)]

[WAC 173-303-806(4)(b)(iv), WAC 173-303-630(8)(a), 40 CFR 270.15(c), 40 CFR 264.176]

Explosive and shock sensitive wastes, as described in WAC 173-303-090(7)(a)(vi), (vii), and (viii), are not accepted by the MWF. However, should this type of waste be identified as present at the MWF, the waste will be segregated from all other materials and relocated in such a fashion that will prevent detonation. The packaging of this waste will be conducted under the direction of the Richland Fire Department Bomb Squad. The waste will be removed from the MWF and sent for proper treatment or disposal. The Contingency Plan will be activated if explosive or shock sensitive waste is discovered in the MWF.

Other wastes designated as reactive, if present, when in storage will be segregated and placed into the hazardous materials storage cabinets located inside room SB-02 or WSB-04. All reactive wastes are stored in accordance with the Uniform Fire Code.

4.1.6.2 Management of Ignitable Wastes in Containers [D-1f(2)]

[WAC 173-303-806(4)(b)(iv), WAC 173-303-630(8)(b), 40 CFR 270.15(c), 40 CFR 264.176]

Wastes designated as ignitable, if present, when in storage will be segregated and placed into the hazardous materials storage cabinets located inside room SB-02 or WSB-04. All ignitable wastes are stored in accordance with the Uniform Fire Code.

4.1.6.3 Design of Areas to Manage Incompatible Wastes [D-1f(3)]

[WAC 173-303-806(4)(b)(iv), WAC 173-303-630(9)(c), 40 CFR 270.15(c), 40 CFR 264.177]

Wastes designated as incompatible, if present, when in storage will be segregated and placed into the hazardous materials storage cabinets located inside room SB-02 or WSB-04. All incompatible wastes are stored in accordance with the Uniform Fire Code.

Upon receipt, shipping containers holding incompatible waste will immediately be segregated into compatible groups. Each compatible group is then stored in its own hazardous material storage cabinet.

The MWF will not rely on the same secondary containment system to provide secondary containment for incompatible wastes. Incompatible wastes will not be placed in the same container or on the same secondary containment pallet unless the requirements of WAC 173-303-395(1)(b) are met.

4.1.7 Storage for Disposal Requirements for PCB Wastes

PFNW-R will comply with the storage limitations of 40 CFR 761.65(a)(1) for storage of PCBs and PCB items at a concentration of ≥50 ppm. As specified in this regulation, PCB/radioactive waste removed from service for disposal is exempt from the 1-year time limit (i.e., disposal within 1 year from decision to dispose of PCB waste) as long as PFNW-R provides a notification to EPA Region 10 at least 30 days prior to the initial 1-year time limit and the notification identifies the storer, the types, the volumes, and the locations of the PCB waste, and the reasons for failure to meet the initial 1-year time limit. Under this situation, the PCB radioactive waste will be managed in accordance with other applicable federal, state, and local laws and regulations for the management of radioactive material;

and a written record documenting all continuing attempts to secure disposal will be maintained at the facility until the waste is disposed of. This written record will be available for inspection or submission if EPA requests it. PFNW-R may also request a 1-year extension in accordance with 40 CFR 761.65(a)(2) or additional extensions in accordance with 40 CFR 761.65(a)(3).

Building 13, where PCB waste is stored, has adequate roof and walls to prevent rain water from reaching the stored PCBs and PCB items. Even though it is not required by regulation, PCB/radioactive waste storage areas have a minimum of 6-inch high curb. As demonstrated in subsection 4.1.4.1.3 of this application, the containment volume in each PCB storage area is equal to at least two times the internal volume of the largest PCB container, or 25% of the total internal volume of all PCB containers stored there, whichever is greater.

There are no drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow out of the curbed PCB storage areas.

PCB storage area floors and curbing are constructed of concrete, which prevents or minimizes penetration of PCBs. The entire Building 13 is not located below the 100-year flood water elevation (see Figures 3.0a and 3.0b in Section 2). As required by 40 CFR 761.40(a)(10), PCB storage areas will be marked as illustrated in Figure 1 in 40 CFR 761.45(a).

Movable equipment used for handling PCBs and PCB items in the storage units and that comes in direct contact with PCBs will not be removed outside PCB storage areas unless it is decontaminated, as specified in 40 CFR 761.79.

All PCB items in storage areas will be checked for leaks at least once every 30 days. Any leaking PCB items and their contents will be transferred to properly marked, non-leaking containers. Any spilled or leaked material will be immediately cleaned up, and the materials and residues containing PCBs will be disposed of in accordance with 40 CFR 761.61. Records of inspection, maintenance, cleanup, and disposal will be maintained at the facility in accordance with 40 CFR 761.180(a) and (b).

The storage containers used for PCBs will meet the requirements of 40 CFR 761.65(c)(6) and (7).

4.2 Tank Systems [D-2]

[WAC 173-303-806(4)(c), WAC 173-303-640, WAC 173-303-395(6), 40 CFR 270.16, 40 CFR 264.190 – 264.199, 40 CFR 264.1030 – 264.1065]

A tank as defined by 40 CFR 260.10 is a stationary device designed to contain hazardous waste. This section provides necessary tank design, construction and operation information to adequately assess the suitability of each tank system for its designated use within the MWF. No treatment activities take place in tanks at the MWF. Table 4-7 includes a list of tank systems at the MWF:

Table 4-7. Tank Systems

System Designation	Tank Location	Tank Designation	Tank Nominal Capacity – Gallons	Tank Use
Thermal Desorber Collection Tank	Building 13, Thermal Area	T-310	1,000	Storage

Temporary Storage Tanks

In addition to the tanks listed in Table 4-7 that will be permitted tanks, there may also be tanks for temporary, less than 90-day storage. Temporary storage tanks will be emptied, and documented as such, at least every 90 days. A listing of the less than 90 day storage tanks will be maintained at the facility. No treatment will take place in the temporary storage tanks.

Thermal Desorber Organic Liquid Collection Tank T-310

This tank is part of the Thermal Desorber (TT-08) system. Moisture, liquid organic material and mercury collected from the thermal desorption (or mercury retort) process are pumped into this tank. A transfer pump will move the liquids from the tank to containers for characterization and further treatment, as required, and proper disposal. No treatment of waste will occur in this tank.

4.2.1 Design, Installation and Assessment of Tank Systems [D-2a]

[WAC 173-303-806(4)(c)(i),(ii),(v),(vi), WAC 173-303-640(2),(3), 40 CFR 270.16(a),(b),(e),(f), 40 CFR 264.191, 264.192]

4.2.1.1 Design Requirements [D-2a(1)]

[WAC 173-303-640(2)(c), (3)(a), 40 CFR 264.191(b), 40 CFR 264.192(a)]

Tanks and ancillary equipment are designed and fabricated to ensure that the equipment will not collapse or rupture under design loads. See the Tank Certification packages included as Attachment 4-4. Tank designs and operating specifications are included as part of Attachment 4-4 for the T-310 Thermal Desorber Organic Liquid Collection Tank.

The tank data sheets and certification packages include details of the materials of construction, tank dimensions, tank capacity, shell thickness, allowable corrosion, connections, structural supports, anchors, and seam requirements. All tank foundations and supports are designed in accordance with the American Concrete Institute and American Institute of Steel Construction.

All tank system components are prefabricated and are commercially available. Vendor-supplied design data and certifications are used to evaluate the adequacy of the components of each tank system design with respect to the applicable design standards. This ensures that components of the tank systems will not collapse, rupture, or fail during installation or operation. Installation procedures, based on manufacturer specifications, will be developed and followed to ensure the safe installation of each tanks. Ancillary piping is designed to meet ANSI standards for process piping.

<u>Thermal Desorber Organic Liquid Collection Tank (T-310)</u>
The Building 13 secondary containment curb provides adequate secondary containment for the tank contents. Liquid and aqueous wastes are the materials handled by this tank system. The waste codes of the waste are limited to those listed in Part A of the application. These wastes have wide ranges in content but should not be corrosive to steel. Treatment activities do not take place within the tank. The purpose is to hold liquid wastes temporarily for transfer to containers.

4.2.1.2 Integrity Assessments [D-2a(2)]

[WAC173-303-640(2)(a), (c) and (e); (3)(a), (b) and (g), 40 CFR 264.191(a) and (b) 40 CFR 264.192(a), (b), and (g)]

Tank certifications provide an independent registered professional engineer's certification that tank support structures, foundation, and ancillary equipment design are structurally sound and sufficiently compatible with wastes stored therein, to ensure that specified tanks will not fail or collapse over the intended life of the tank. Design basis used for design, installation and minimum shell thickness are presented in Attachment 4-4. The tank certifications meet the requirements of WAC 173-303-640(3).

Before put into service, ultrasonic thickness testing must be performed on the Thermal Desorber Tank T-310 to sufficient thickness of the tank materials. In addition, ultrasonic thickness testing will be repeated annually on tank T-310.

The schedule for additional integrity assessments over the intended life of the tank systems is included in the MWF Inspection Plan in Section 6.

4.2.1.3 Additional Requirements for Existing Tanks [D-2a(3)]

[WAC 173-303-640(2)(a) and (c)(v), 40 CFR 264.191(a) and (b)(5)]

No existing tank previously permitted will continue to be in service at the MWF. Therefore this subsection is not applicable.

4.2.1.4 Additional Requirements for New Tanks [D-2a(4)]

[WAC 173-303-640(3)(c), (e), (f) and (g), 40 CFR 264.192(b), (d), and (e)]

New tanks that will be in service at the MWF include:

- T-310, Thermal Desorber Organic Liquid Collection Tank

Tanks will be installed in compliance with WAC 173-303-640(3)(c). Tanks, components and ancillary equipment will be carefully handled by a subcontractor who is specialized in tank installation to prevent damage to tank systems during installation. No underground tanks will be installed at the MWF. After tanks systems have been installed and before being placed in service, tanks systems will be inspected by an independent, qualified, installation inspector or licensed professional engineer for the following items:

- Weld brakes,
- Punctures,
- Scrapes of protective coatings, where applicable,
- Cracks,
- Corrosion, and
- Other structural damage or inadequate construction or installation.

Discrepancies must be remedied before the tank systems are placed into use. New tanks and ancillary equipment will be tested for tightness prior to being placed in service. If a leak is found, the tank system or ancillary equipment will be repaired and re-inspected before being placed in service.

An independent, qualified, registered professional engineer, familiar with the appropriate installation procedures for tanks, will ensure that the installation of the waste tanks systems follows proper procedures with no resultant damage to the system. Records of new tank installations and a copy of the installation report, signed by such person, will be maintained at the MWF.

Ancillary equipment will be supported and protected to prevent excessive stresses due to physical hazards, settlement, vibration, expansion, or contraction. Ancillary equipment installation will use as a reference ANSI Standard B31.3, "Petroleum Refinery Piping," or an equivalent standard reference for proper installation of piping systems.

No active corrosion protection systems are part of any tank system at the MWF. Corrosion protection for new tanks will be administrative; the waste pH range will be limited to between 2 and 12.5.

4.2.1.5 Additional Requirements for New On-ground or Underground Tanks [D-2a(5)]

[WAC 173-303-640(3)(a)(iii), (iv), and (v), WAC 173-303-640(3)(d), 40 CFR 264.192(a)(3), (4), and (5), and (c)]

Waste tank systems associated with the MWF will not be installed or operated in direct contact with the soil or with water. Therefore, this subsection is not applicable.

4.2.2 Secondary Containment and Release Detection for Tank Systems [D-2b]

[WAC 173-303-640(4), WAC 173-303-806(4)(c)(vii), 40 CFR 270.16(g), 40 CFR 264.193]

4.2.2.1 Requirements for All Tank Systems [D-2b(1)]

This section describes the secondary containment system for tank systems at the MWF. Tank secondary containment systems are designed, installed and operated to prevent any waste migration or cross-contamination with other waste being stored or processed in the MWF.

Thermal Desorber Tank(T-310)

The MWF building concrete foundation which is surrounded by a concrete curb serves a secondary containment function. The treatment of the foundation joints and floor coating is discussed previously in this document. Since the tank system and entire secondary containment system is located inside the MWF Building 13, precipitation cannot enter the building or the containment system. Therefore, containment capacity calculations do not include volume for precipitation run-on. Table 4-8 summarizes the volume of the tank system components.

Table 4-8. Tank System Components Volume

Equipment	Volume (gallons)
Thermal Desorber Tank T-310	1,000
(2) Condensate pump	2
(1) Transfer pump	1
Interconnecting piping	50

i) Foundation – The building concrete foundation is part of the secondary containment system. The foundation is designed to support the tanks system and equipment operating within the tank system, resist pressure gradients above and below the system, and prevent failure due to settlement, compression and uplift. Foundation preparation, design, and construction procedures are discussed in the "Structural Integrity of Base" subsection of this document.

ii) Material Compatibility – The secondary containment for the tank system is constructed of concrete with a sealant coating. Concrete and the specified coating are compatible with the types of wastes that will be handled by the tank system. The tanks and ancillary equipment structural supports will be constructed of steel, with a material compatibility consistent with the material used for the tanks system components. Steel is compatible with the types of wastes that will be handled by the tank system.

iii) Strength and Thickness –The design is determined to have sufficient strength, thickness and resistance to prevent failure from pressure gradients, physical contact with the waste, climatic conditions, and stresses of daily operations. See Attachment 4-4.

iv) Leak Detection – The secondary containment floor is slightly sloped to facilitate both liquids detection and removal. Visual checks of the secondary containment systems will be performed daily when tanks are operational. These checks include visually inspecting for signs of primary containment leaks, run-on or run-off of liquids to and from the secondary containment, signs of corrosion, cracking or other material stress.

v) Drainage and Spill Removal – Secondary containment for the tank system is slightly sloped to a low point. This facilitates collection of liquids and removal. If liquids are present in the secondary containment, the material will be removed with a portable vacuum pump or by absorbents within twenty-four (24) hours from the time of discovery. The material will be collected in a TIC or other appropriate container and evaluated for required treatment processes. The material will be treated on-site, or transported off-site for proper treatment or disposal.

vi) Run-On – The tank system will be housed within the completely enclosed MWF Building 13. The secondary containment system is not exposed to the outdoor environment, so that run-on from a 25-year, 24-hour storm will be excluded from the system. The entire MWF building is also designed with a concrete curb higher than the outside grade. In addition, the grade surrounding the building is sloped away from the building in order to prevent run-on.

The largest tank volume is 1,000 gallons, or 150 ft^3. As demonstrated previously, the Building 13 Thermal Area secondary containment system has a containment capacity which is sufficient volume to contain the largest tank volume.

4.2.2.2 Additional Requirements for Specific Types of Systems [D-2b(2)]

4.2.2.2.1 Vault Systems [D-2b(2)(a)]

[WAC 173-303-640(4)(e)(ii), 40 CFR 264.193(e)(2)]

The secondary containment system is not a vault system. Therefore, this subsection is not applicable.

4.2.2.2.2 Double-walled Tanks [D-2b(2)(b)]

[WAC 173-303-640(4)(e)(iii), 40 CFR 264.193(e)(3)]

All MWF waste tanks are a single-shell design, not double-wall design. No double-walled tanks are being proposed. Therefore, this subsection is not applicable.

4.2.2.2.3 Ancillary Equipment [D-2b(2)(c)]

[WAC 173-303-640(4)(f), 40 CFR 264.193(f)]

The secondary containment for the following tanks systems' ancillary equipment will be provided by the same containment for the entire tank system:

- T-310 Thermal Desorber Organic Liquid Collection Tank

Waste-bearing piping extending outside of the secondary containment for these tanks will be constructed of double encased pipe. The outer pipe, used as secondary containment is specified as polyvinyl chloride (PVC). Leak detection in the annular space between the inner and outer pipe will be accomplished by either lining the space with conductivity tape, providing the outer pipe with valving that can be visually detected, or having the lowest end of the outer pipe open to a containment structure.

4.2.3 Variances from Secondary Containment Requirements [D-2c]

[WAC 173-303-640(4)(g) and (h), WAC 173-303-640(1)(b), WAC 173-303-806(c)(viii), 40 CFR 270.16(h), 40 CFR 264.193(g) and (h), 40 CFR 264.190(a)]

No variances are requested for the tank systems specified in the MWF. Therefore, this subsection is not applicable.

4.2.4 Tank Management Practices [D-2d]

[WAC 173-303-806(4)(c)(iii),(iv),(ix); WAC 173-303-640(5)(a) and (b), 40 CFR 270.16(c), (d), and (i), 40 CFR 264.194(a) and (b)]

Each tank system is designed to manage the wastes that will be accepted for treatment as listed in the facility's Part A application. Procedures for each treatment process, developed prior to receipt of any waste at the MWF, provide operational controls to ensure that any waste or treatment reagent that could cause a tank to rupture, leak, corrode, or otherwise fail is not placed in such tanks. As part of waste acceptance, all wastes and proposed treatment agents are assessed for compatibility with materials of construction in the tank systems. A chemical resistance guide is used for the selection of tanks to ensure that the waste placed in the tank is compatible with the tank material. An example of a chemical resistance guide is provided as Attachment 4-5. The following practices are employed to ensure tank failure does not occur.

i) Overfilling – Each tank that will handle waste is fitted with a level sensor, level switches and automatic shut-offs. The level sensor provides tank volume data and has a high and high-high level alarm set point. The high alarm set point is designed to provide a warning signal to halt tank filling operations. The high-high set point activates the automatic shut-off to stop the filling operation automatically. High-high alarms are annunciated at the operator control room panel.

ii) Freeboard – All tanks are inside and are not open to the environment. No tanks are uncovered or susceptible to overtopping by wave or wind action or by precipitation. Therefore maintenance of freeboard and this subsection is not applicable.

iii) Diagrams – A flow diagram of the tank systems that include diagram of piping and instrumentation is included in the in Section 12.

iv) Treatment Procedures – No treatment of wastes will occur in these tanks – only storage. Therefore this subsection is not applicable.

4.2.5 Labels or Signs [D-2e]

[WAC 173-303-806(4)(c)(xi), WAC 173-303-395(6), WAC 173-303-640(5)(d)]

Tanks that handle waste will be labeled on two sides in black letters identifying the major risk associated with the contents and the tank number. The tank label area will be a light color, as necessary, to provide a contrast for the black lettering to enhance visibility. Tank identification labels or markings will be visible from a minimum distance of 50 feet. Labels/markings will be inspected to ensure they are not obscured, removed, or unreadable. The HMIS and/or NFPA labeling systems will be used to provide information on waste characteristics which identify the major risk associated with the waste in the tank.

4.2.6 Air Emissions [D-2f]

[WAC 173-303-806(4)(c)(xii), WAC 173-303-640(5)(e)]

The control of fugitive emissions is provided by venting the airspace above the incoming waste containers and the tank system to the Building Ventilation System. After treatment by the building filter banks, the building exhaust is discharged to atmosphere.

4.2.7 Management of Ignitable or Reactive Wastes in Tank Systems [D-2g]

[WAC 173-303-806(4)(c)(x), WAC 173-303-640(9), 40 CFR 270.16(f), 40 CFR 264.198]

Table 4-9 identifies which tanks can accept ignitable and reactive wastes.

Table 4-9. Ignitable and Reactive Wastes in Tanks

Tank System Name	Tank Designation	Ignitable (waste code D001)	Reactive (waste code D003)
		Is waste accepted by tank system?	
Thermal Desorber Collection Tank	T-310	Yes	Yes

Thermal Desorber Organic Liquid Collection Tank T-310

Ignitable Waste – Ignitable wastes will be stored and processed with compatible material. Ignitable waste will be stored in such a way that it is protected from any material or condition that may cause the waste to ignite. The waste will be stored away from ignition sources. "Danger-No Smoking, No Open Flames" (or similar) signs are posted prominently. Smoking is not permitted within the MWF. During maintenance operations, the tank will be grounded to protect against sparking.

Reactive Waste – Reactive waste may be forwarded to this tank system for temporary storage. The tank is located away from a property line which is or can be built upon and away from the nearest side of any public way or public building or property line, as required by the NFPA buffer zone requirements for reactive wastes.

Reactive wastes identified in WAC 173-303-090(7)(a)(vii) and (viii) is restricted from this tank system. However, other waste with reactive characteristics may be accepted by the MWF. See Part A of this application for a list of waste codes accepted. Compatibility testing described in the WAP will be used to determine what reactive wastes can be consolidated. Tanks previously containing reactive wastes will not be used to store incompatible wastes until at least one waste, compatible with both wastes is stored in the tank, or the tank has been cleaned.

More details of the safe management practices used to handle or store ignitable or reactive wastes is presented in the "Procedures to Prevent Hazards" section of this application.

4.2.8 Management of Incompatible Wastes in Tank Systems [D-2h]

[WAC 173-303-806(4)(c)(x), WAC-173-303-640(10), 40 CFR 270.16(f), 40 CFR 264.199]

Each tank system is designed to provide primary and secondary containment, for waste stored therein. The waste, by tank system design, is prevented from commingling with potentially incompatible waste staged for or stored in neighboring tank system. Administrative controls and inherent design features, described earlier in this section, segregate incompatible wastes and materials. Wastes which are incompatible with the previous contents of the tanks will not be placed in that same tank until the tanks has been cleaned. Compatibility determinations will be based on compatibility testing as described in the WAP.

4.3 Waste Piles [D-3]

The permitting of waste piles is not requested in this application. Therefore, this subsection is not applicable.

4.4 Surface Impoundments [D-4]

The permitting of surface impoundments is not requested in this application. Therefore, this subsection is not applicable.

4.5 Incinerators [D-5]

The permitting of incinerators is not requested in this application. Therefore, this subsection is not applicable.

4.6 Landfills [D-6]

The permitting of landfills is not requested in this application. Therefore, this subsection is not applicable.

4.7 Land Treatment [D-7]

The permitting of land treatment is not requested in this application. Therefore, this subsection is not applicable.

4.8 Miscellaneous Units

[WAC 173-303-803, WAC-173-303-680, 40 CFR 270.23, 40 CFR 264.600-603]

This subsection describes the physical characteristics of the process units. Detailed descriptions of the treatment processes are included in the next subsection. Additional drawings of process equipment layout and equipment details are included in Section 12. Dimensions noted below are approximate. All mixed-waste process units are located in Building 13. Information about the TP-13 Sorting system is not included in this subsection because based on the definition of treatment in 40 CFR 260.10, TP-13 is not considered a hazardous waste treatment operation.

4.8.1 TP-01 Size Reduction and Screening System

This process includes an integrated screen and shredder assembly that includes a skip hoist, conveyor and hopper. The unit is used to reduce the size of waste solids for easier handling, packaging, pre-treatment or treatment. TP-01 is physically located in Building 13, Room SB-06 and is not a portable unit. The approximately 40 ft x 17 ft x 25 ft tall unit is constructed of carbon steel. Details of the unit are shown in drawing DWG-STB-GA-TP01-001.

4.8.2 TP-02 Cutting and Shearing System

This process includes the use of a wide variety of hand tools and work benches for the purpose of reducing the physical size of waste solids for easier handling, packaging, pre-treatment, or treatment. TP-02 is a portable process. These activities, with associated tools, may take place in multiple areas within Building 13. The hand tools are constructed of a variety of materials, mostly carbon steel or stainless steel.

4.8.3 TP-07 Compaction and Macroencapsulation System

This process includes a super compactor unit with an integrated conveyor that takes several containers of waste and greatly reduces their volume by the application of compression force. The unit is used to prepare waste solids for macro-encapsulation treatment (MACRO). The compressed containers are then removed from the super compactor, placed in an overpack and encapsulated. The super compactor is physically located in Building 13, Room SB-08 and is not a portable unit. The approximately 25ft x 6 ft x 13ft tall unit is constructed of steel. Details of the unit are shown in drawing DWG-STB-GA-TP07-001 Sheet 1.

4.8.4 TT-02 Low-Capacity Mixing System

This process includes a mixer with integrated feeders (one for feeding wastes and one for feeding reagents). The unit is used to stabilize (STABL) waste by mixing various reagents with the wastes. TT-02 is physically located in Building 13, Room SB-06 and is not a portable unit. The approximately 20ft x 10ft x 20ft tall unit is constructed of a carbon steel support structure with a carbon steel container, mixer shaft and mixer paddles with urethane wipers on the ends of the paddles. Details of the unit are shown in drawing DWG-STB-GA-TT02-001.

4.8.5 TT-05 Physical Extraction System

This process uses abrasion to physically remove waste solids from the surface of debris waste, an alternate LDR treatment standard. TT-05 includes a work table, a turntable/trolley assembly, an abrasive media blasting pump unit. The TT-05 equipment is mostly constructed of steel and is enclosed by a temporary enclosure. TT-05 is a portable unit and may be located in several different rooms in Building 13. The enclosure for the unit equipment is approximately 20ft x 5ft x 10ft tall unit. Details of the unit are shown in drawing DWG-STB-GA-TT05-001.

4.8.6 [Reserved]

4.8.7 TT-08 Thermal Desorber System (RTD)

This process includes a thermal desorber with an integrated waste off-gas treatment system. The unit provides thermal desorption and mercury retorting (RMERC). TT-08 is physically located in Building 13, Room MWT-02 and is not a portable unit. The approximately 34ft x 12ft x 6 tall unit is constructed of steel. Details of the unit are shown in drawings DWG-GA-FAC-001, RTD P&ID, 32004-PID-200, 32004-PID-201 and 32004-PID-300.

4.8.8 [Reserved]

4.9 Process Descriptions

4.9.1 Process Description Summary

The Non-Thermal Area incorporates all systems and ancillary equipment needed for the safe and reliable operation of the pretreatment and non-thermal treatment processes. The Thermal Area will encompass all of the subsystems needed to ensure safe and reliable operation of the pretreatment, some non-thermal treatment processes, as well as all of the thermal treatment processes. A Mixed Waste Facility Process list and their assigned construction schedule are included in Table 4-10.

Table 4-10. Process Construction Schedule

Process Description	Process Designation	Proposed Construction Completion Date
Size Reduction and Screening	TP-01	Construction Complete
Cutting and Shearing	TP-02	Construction Complete
Sorting (Not Treatment)	TP-13	Second half 2012
Liquid Treatment	TP-14	Second half 2012
Compaction and Macroencapsulation	TP-07	Construction Complete
Extraction Mixing	TP-10	Second half 2012
High-Capacity Mixing	TT-01	Second half 2012
Low-Capacity Mixing	TT-02	Construction Complete
In-Container Mixing and Metal Stabilization	TT-03	Construction Complete
Physical Extraction	TT-05	Construction Complete
Thermal Desorber	TT-08**	Construction Complete
Mercury Amaglamation	TT-09	Construction Complete / Second half 2012 *
Debris Washing	TT-10	Second half 2012

* Construction of the equipment to perform mercury retort (Thermal Desorber) and bench scale amalgamation is complete. Construction of equipment to perform bulk amalgamation will occur during the second half of 2012.
**Thermal treatment process.

4.9.2 Non-Thermal Area Process Overview

The Non-Thermal Area houses ancillary equipment and non-thermal treatment equipment for treating waste streams including: soils and inorganic debris, liquids and slurries, bulk lead and metals and heterogeneous solids and debris. Each treatment process is designed to pre-treat and/or treat the waste to meet Resource Conservation Recovery Act (RCRA) Land Disposal Restriction (LDR) requirements. The Non-Thermal Area is equipped with systems and processes to treat and stabilize a wide variety of low-level mixed wastes (LLMW) and TSCA regulated wastes. Materials treated may contain both organic and inorganic matter. Emissions generated during waste treatment conducted in the Non-Thermal Area of Building 13 are collected and treated in the Non-Thermal Area process ventilation system (SB-09). The exhaust from this process ventilation system is then discharged through and treated by the Non-Thermal Area building ventilation system (SB-02). If normal or fugitive emissions generated are not ventilated directly to and treated by process ventilation system (SB-09) first, they are treated by the building ventilation system (SB-02) directly.

The following functions occur in the Non-Thermal Area:

1. the initial staging and inspection of the incoming waste;
2. the pretreatment of the waste, including sorting, size reduction, and chemical adjustment;
3. the treatment of the waste, according to RCRA LDR and TSCA regulations, encompassing:

    a) stabilization (STABL): mixing/chemical reactions with either cement or polymer-based reagents;

    b) immobilization by macro encapsulation (MACRO): applying a coating or jacket of inert materials or polymeric organics to substantially reduce surface exposure to potential leaching media;

    c) neutralization (NEUTR): neutralizing with reagents to result in a pH greater than 2 but less than 12.5 as measured in the aqueous residuals;

    d) chemical or UV-assisted oxidation (CHOXD); oxidation through the use of, or combinations of reagents such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals;

    e) chemical reduction (CHRED); reduction through the use of, or combinations of reagents such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals;

    f) deactivation (DEACT); the removal of the hazardous characteristics of a waste due to its ignitability, corrosivity, and /or reactivity;

    g) carbon adsorption (CARBN): the adsorption of non-metallic inorganics, organo-metallics, and/or organic constituents on granulated or powdered carbon;

    h) amalgamation (AMLGM): the forming of a semi-solid amalgam by mixing inorganic reagents with liquid, elemental mercury;

    i) physical extraction by abrasive blasting;

    j) washing, rinsing and grouting of wastes (e.g., metal turnings);

    k) solvent extraction,

    l) precipitation (PRECP), or

    m) ion exhange.

4. the handling, storage and treatment of secondary waste (if necessary); and
5. the final packaging and certification of the treated waste according to LDR regulations.

The final product from stabilization, macro-encapsulation and alternate debris treatment processes will be suitable for either:

1) burial at a mixed waste disposal facility licensed under RCRA Subtitle C and the Atomic Energy Act (AEA) or state license; or

2) burial at a low-level waste (LLW) disposal site regulated under the AEA or state license; or

3) burial at TSCA-permitted facility; or

4) disposal at a facility with any combination of approvals under RCRA, AEA, state license and TSCA; or

5) disposal at a solid waste landfill.

Wastes treated may be sent to be free-released by a facility regulated pursuant to the AEA for further decontamination and free-release (i.e. removal of RCRA hazardous waste codes and removal of radioactivity) for re-use. The system will be designed, constructed, operated, and closed under the standards required by Washington State Dangerous Waste Regulation (Washington Administrative Code [WAC] 173-303-600).

4.9.3 Thermal Area Process Overview

The Thermal Area houses ancillary equipment and thermal treatment equipment for treating waste streams including: soils and inorganic debris, liquids and slurries, bulk lead and metals and heterogeneous solids and debris. Each treatment process is designed to pre-treat and/or treat the waste to meet RCRA LDR requirements. The Thermal Area is equipped with systems and processes to treat and stabilize a wide variety of LLMW and TSCA regulated wastes. Materials treated may contain both organic and inorganic matter. Emissions generated during waste treatment conducted in the Thermal Area of Building 13 are collected and treated in the Thermal Area process ventilation system (GV-09). The exhaust from the process ventilation system is then discharged through and treated by the Thermal Area building ventilation system (GV-22). If normal or fugitive emissions are not ventilated directly to and treated by the process ventilation system (GV-09) first, they are treated by the building ventilation system (GV-22) directly.

The following functions occur in the Thermal Area:

1. the pretreatment of the waste, including inspecting, sorting, size reduction, drying, and

chemical adjustment;

2. the treatment of the waste, according to RCRA LDR and TSCA regulations, encompassing:

   a) desorbing of liquids from solids: the volatilizing of liquids and subsequent condensing and recovery (this process will be performed in the Thermal Desorber);

   b) stabilization (STABL): mixing/chemical reactions with either cement or polymer-based reagents;

   c) immobilization by macro encapsulation (MACRO): applying a coating or jacket of inert materials or polymeric organics to substantially reduce surface exposure to leaching media;

   d) neutralization (NEUTR): neutralizing with reagents to result in a pH greater than 2 but less than 12.5 as measured in the aqueous residuals;

   e) chemical or UV-assisted oxidation (CHOXD); oxidation through the use of, or combinations of reagents such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals;

   f) chemical reduction (CHRED); reduction through the use of, or combinations of reagents such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals;

   g) deactivation (DEACT); the removal of the hazardous characteristics of a waste due to its ignitability, corrosivity, and /or reactivity;

   h) carbon adsorption (CARBN): the adsorption of non-metallic inorganics, organo-metallics, and/or organic constituents on granulated or powdered carbon;

   i) amalgamation (AMLGM): the forming of a semi-solid amalgam by mixing inorganic reagents with liquid, elemental mercury;

   j) retorting of mercury (RMERC): the volatilizing of mercury and subsequent condensing and recovery (this process will be performed in the Thermal Desorber);

   k) physical extraction by abrasive blasting;

   l) washing, rinsing and grouting of wastes (e.g., metal turnings)

   m) solvent extraction,

   n) precipitation (PRECP), or

   o) ion exchange.

3. the handling, storage and treatment of secondary waste (if necessary); and

4. the final packaging and certification of the treated waste according to LDR regulations.

The final product is suitable for either:

1) burial at a mixed waste disposal facility licensed under RCRA Subtitle C and the AEA or state license; or

2) burial at a LLW disposal site regulated under the AEA or state license; or

3) burial at TSCA-permitted facility; or

4) disposal at a facility with any combination of approvals under RCRA, AEA, state license and TSCA; or

5) disposal at a solid waste landfill.

Wastes treated may be sent to be free-released by a facility regulated pursuant to the AEA for further decontamination and free-release for re-use. The system will be designed, constructed, operated, and closed under the standards required by Washington State Dangerous Waste Regulation (Washington Administrative Code [WAC] 173-303-600).

4.9.4 Process Description Details

Table 4-11 contains a listing of each of the treatment process systems and their classification according to WAC 173-303. Table 4-12 notes the fixed location (if applicable) and possible location of each portable treatment process. Note that no treatment will occur in tanks. Tank storage of waste will occur in the Thermal Area of Building 13.

Table 4-11. Process Regulatory Classification

Process	Treatment in Containers	Thermal / Miscellaneous Units
Containerized Waste Staging / Storage (Not Treatment)	To occur in Room: SB-02, SB-03, SB-04 SB-05, SB-06, SB-07, SB-08, SB-09, SB-11 MWT-01, MWT-02, MWT-04, WSB-1, WSB-2, WSB-3 and WSB-4 of Building 13	
TP-01 Size Reduction and Screening		Screen and Shredder Assembly
TP-02 Cutting and Shearing		Cutting and Shearing Tools
TP-13 Sorting (Not Treatment)		1) Sorting Table 2) Sorting Glove Box Does not meet the definition of treatment in 40 CFR 260.10
TP-14 Liquid Treatment	Four Containers and Ancillary Equipment	
TP-07 Compaction and Macroencapsulation	In-Drum Compactor	Super Compactor

Process	Treatment in Containers	Thermal / Miscellaneous Units
TP-10 Extraction Mixing	Extraction Mixer Assembly	
TT-01 High-Capacity Mixing	High-Capacity Mixer Assembly	
TT-02 Low-Capacity Mixing		Low-Capacity Mixer Assembly
TT-03 In-Container Mixing and Metal Stabilization	1) In-Container Mixer Assembly 2) Drum Roller	
TT-05 Physical Extraction		Abrasive Blasting Unit
TT-08 Thermal Desorber		Thermal Desorber System
TT-09 Mercury Amalgamation	1) Bench Scale 2) Bulk Scale System	
TT-10 Debris Washing	1) Debris Washing Assembly 2) Debris Washing Multi-Vat Assembly	

Table 4-12. Process Location

Process	Building	Area	Room*
Containerized Waste Staging / Storage* (Not treatment)	13	Non-Thermal,	SB-02, SB-03, SB-04 SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04,
		Waste Storage	WSB-1, WSB-2, WSB-3, WSB-4
TP-01 Size Reduction and Screening	13	Non-Thermal	SB-06
TP-02* Cutting and Shearing	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04
TP-13* Sorting (Not treatment)	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04
TP-14* Liquid Treatment	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04
TP-07 Compaction and Macroencapsulation (In-drum compactor and grouting activities*)	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04
TP-07 Compaction and Macroencapsulation (Super compactor)	13	Non-Thermal	SB-08
TP-10* Extraction Mixing	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04

Process	Building	Area	Room*
TT-01* High-Capacity Mixing	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04
TT-02 Low-Capacity Mixing	13	Non-Thermal	SB-06
TT-03* In-Container Mixing and Metal Stabilization	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04
TT-05* Physical Extraction	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04
TT-08 Thermal Desorber	13	Thermal	MWT-02
TT-09* Mercury Amaglamation	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04
TT-10* Debris Washing	13	Non-Thermal	SB-03, SB-05, SB-06, SB-07, SB-08, SB-09, SB-11
		Thermal	MWT-01, MWT-02, MWT-04

* Portable processes may occur in multiple rooms.

A brief description of the equipment, included in each pretreatment and treatment system is presented below. Refer to Part A for unit process design rates.

TP-01 - Size Reduction and Screening System: The function of this system is to produce uniformly sized pieces from incoming non-liquid waste materials to meet the size requirements of another pretreatment or treatment process. TP-01 has a container skip hoist, a transfer feed conveyor and intake hopper, an integrated single stage quad-shear shredder with an internal-mounted screen, and a TIC filling station.

Drummed waste to be processed is consolidated in an empty B-25 box. An enclosed waste container skip hoist is designed to accept waste in B-25 box containers. The skip hoist automatically secures the B-25 container and dumps it directly onto the enclosed metering conveyor inlet hopper. The conveyor then meters the waste into the shredder inlet housing. The system reduces the size of the input solid wastes to approximately 3/8 inch. The screen mounted directly below the shredder teeth allows passage of the material that is below 3/8 inch size. Material larger than 3/8 inch is returned to the top of the shredder teeth and re-ground. The waste will flow through the sizing screen onto a conveying feeder. The feeder then dumps the waste into a TIC placed in the filling station under the shredder. When full, the TIC will be transported to another system for further treatment, or transported off-site for disposal.

The entire system, beginning at the B-25 box skip hoist, is completely confined within airtight enclosures to control fugitive dust emissions. The vents from the enclosures are connected to a dust collection baghouse and then to a process vent line which maintains the space within the enclosure at a slightly negative pressure with respect to the atmosphere pressure in the room. Any fugitive emissions and dust generated during TP-01 operations are collected by the process vent line and conveyed to the Non-Thermal Area process ventilation system (SB-09).

At the end of each campaign, the system is allowed to operate for a minimum of 15 minutes so that all of the solid material is discharged from the hoppers, conveyors, and shredder. Next, the equipment access doors are opened and solid residues are removed by a vacuum unit to the extent practical. The floor area adjacent to the system components is also vacuumed. Residues collected during the cleaning operations are discharged inside a container and sent for processing with the rest of the waste in the campaign. Process TP-01 is located in Room SB-06. TP-01 may be used to process TSCA-regulated wastes.

***TP-02 – Cutting and Shearing System:** The cutting and shearing system has work benches, tables, electric saws, shear cutters, a high-pressure water cutter and hand tools such as pneumatic, air, and electrically operated grinders, drills, hammers, chisels, and cutting torches. These operations are ventilated by the Non-Thermal Area process ventilation system (SB-09). The function of the cutting and shearing system is to reduce large waste objects to a size suitable for further processing in other pretreatment and treatment systems. Objects that may require shearing include metal, wood, plastic and construction debris such as discarded tanks, piping, and paneling. Containers of stabilized wastes that do not pass the required LDR treatment standards are also processed by this system. Their container metal skin is cut and removed, and the stabilized waste sent to the size reduction and screening system (TP-01) for re-shredding. Waste requiring size reduction is brought to the cutting and shearing area in TICs or in their original containers. The Cutting and Shearing system TP-02 can accommodate container sizes up to that of B-25 boxes. Wastes are manually removed from the incoming containers and placed in an appropriate size reduction tool table or on the floor within a curbed containment area. The size reduced waste is placed in a TIC which is transported to an appropriate pretreatment and treatment system. TP-02 is a portable process and activities may take place in multiple areas within the MWF (See Table 4-12). TP-02 may be used to process TSCA-regulated wastes.

***TP-13 - Sorting System:** The sorting system will include a sorting table and a glove box. If not performed inside the glove box, the waste handling area of the system is covered either by an enclosure, hood assembly or temporary containment system (TCS). Air ventilated from the hood, enclosure, TCS or glove box will be sent to a portable high efficiency particulate air (HEPA) filter and then to the Non-Thermal Area process ventilation system (SB-09) for treatment. The frame or skid-mounted sorting glove box and other sorting equipment can be moved throughout the facility as required for sorting operations. The sorting system segregates heterogeneous and debris non-liquid wastes into several categories so that they can receive the appropriate pretreatment or treatment. Waste not compatible with any of the MWF treatment systems and that will require repackaging for its return to the generator may also be sorted through this system. Containers of wastes requiring segregation are delivered to the system by a forklift truck or a cart. A visual inspection is conducted and large objects and other items not requiring detailed sorting are removed and placed in an appropriate TIC. When appropriate for safety concerns, the containers will be placed into the glove box where they will be opened and manually sorted.

The sorted waste is placed in containers or TICs and transported to the appropriate pretreatment, treatment or packaging system. TP-13 activities may take place in multiple areas within the MWF (See Table 4-12). TP-13 may be used to process TSCA-regulated wastes. Based on the definition of treatment in 40 CFR 260.10, TP-13 is not considered a hazardous waste treatment operation. Therefore, this process is not included in the Part A application.

***TP-14 - Liquid Treatment System:** This system will have four containers (each 180 to 550 gallons in size) with mixers, pumps, strainer/filters, piping and valve manifolds, a granular activated carbon adsorber, an ion exchange unit, a UV oxidation unit, and instrumentation needed to perform the specified filtration and chemical adjustments. Each of these four containers will be individually, independently portable. All fugitive emissions from system will be vented to the Non-Thermal Area process ventilation system (SB-09).

Chemical adjustment will be as per dangerous waste standards WAC 173-303-140 (40 CFR 268.40) including NEUTR, CHOXD, UV-assisted oxidation, CHRED, DEACT, PRECP, ion exchange, or CARBN. The system will receive liquid waste for treatment by neutralization, oxidization, reduction, deactivation, precipitation, and carbon adsorption. Neutralization, chemical oxidation and reduction, and deactivation will occur in one of the four containers. The three treatment units (carbon filters, ion-exchange, and UV oxidation) will be installed such that they can be used individually or in series for treating a given waste stream. Waste streams containing low concentrations of dissolved organics will be treated by using either carbon adsorption or UV oxidation (or both). Waste streams containing low concentrations of dissolved metals will be treated by the ion exchange unit. If both organics and dissolved metals are present in a liquid waste stream, organics will be removed first, followed by the dissolved metals removal step. Treating waste will begin by transferring incoming waste from an incoming TIC to one of the containers. When all of the waste is transferred to the container, the discharge valve manifolds will be secured such that liquid will flow from the input waste container through the pumps and the desired treatment unit and into the second container. When ready, the mixer and discharge pump will be turned on. Liquid waste flows from the first container to the selected treatment unit/s and back to the second container. The process is repeated until the dissolved organic and metal concentration levels, as periodically measured by sampling and analysis, will meet the LDR concentration requirements. Then, the treatment system in turned off and the treated liquid will be kept in the container until needed for stabilization. When the treated water must be transferred to other systems for re-use, the container contents will be discharged to a TIC. At the end of each waste treatment batch, rinse water will be used to flush the previous wastes out of the containers, equipment, and piping. The rinse water will be collected in a TIC and sent to the stabilization process (i.e., TT-01, TT-02, or TT-03) or containerized for shipment off-site.

To remove the spent media (carbon, ion exchange resins), an empty TIC container (suitable for use in in-container stabilization or feed to a thermal treatment system) will be placed under the treatment unit discharge port. Next, the treatment unit discharge port valve manifold will be secured to drain the spent media into the TIC. If needed, the carbon, ion- exchange, and UV oxidation units will be rinsed with water and the rinsate will be discharged to another TIC. The filled TIC containing spent media will be sent for final treatment to the in-container stabilization process (TT-03). The filled TIC containing rinse water will be sent for stabilization to TT-01, TT-02, or TT-03.

Other major operations conducted in liquid treatment system will include receiving incoming liquid waste, filtering or decanting the incoming or treated wastes, transferring the treated waste to a TIC for transport to other processes, and tank rinsing. Liquid waste will include shipped liquid waste and waste received from other treatment systems. This system may also be used to consolidate liquids received in small volumes (bottles or containers with capacities of less than five gallons, for example) for pretreatment or treatment activities. One or more of the containers serves to hold the incoming waste while others provide the required treatment. Treated liquids from this tank system are pumped to TICs which will be sent to one of the stabilization systems (TT-01, TT-02, and TT-03) or containerized for shipment off-site. TP-14 will be a portable process and activities may take place in multiple areas within the MWF (See Table 4-12). TP-14 may be used to process TSCA-regulated wastes. Since the process is conducted in portable units, this will be considered treatment in container.

TP-07 – Compaction and Macro-Encapsulation System: The system includes a portable in-drum compactor (also called an in-container compactor), a super-compactor* and grouting mechanism. The super-compactor is located in Room SB-08 while the in-drum compactor is portable and may be moved as required. The function of the Compaction and Macro-Encapsulation System (TP-07) system is to provide macro-encapsulation treatment (MACRO) of non-liquid waste and waste classified as debris in accordance with WAC 173-303-040. Macro-encapsulation of hazardous or mixed debris in a sealed jacket of inert material meets the EPA Alternative Debris Treatment Standard and thereby qualifies the debris for disposal in a mixed waste, Subtitle C landfill.

An empty container, up to 110 gallons in size, is placed under the in-drum compactor ram and clamped in place. The in-drum compactor is shown on drawing DWG-MW-GA-009. Containers containing non-liquid wastes (usually debris) or non-liquid wastes that have already been compacted by the generator are transported to the compaction area. Wastes are removed from their original containers or TICs and placed in the container. The in-drum compactor is turned on to compress the waste. The in-container compactor has 50,000 pounds of compaction force. The in-drum filling-compression cycle is repeated several times until the container is full. The filled container is closed and transported to the super-compaction area. If determined necessary depending on waste characteristics, transfer of wastes into the in-drum compactor container and compaction activities may be performed under a hooded area inside an enclosure. The air from the hood is ventilated to one of two baghouses and then to the Non-Thermal Area process ventilation system (SB-09). Ventilation from the enclosure is collected and treated by the Non-Thermal Area process ventilation system (SB-09). If in-drum compaction does not take place in an enclosure, the in-drum compactor process will be ventilated by the building ventilation system.

Compacted containers are then placed onto the super-compactor conveyor and the super-compaction cycle is started. The super-compactor has 350,000 pounds of compaction force. The super-compactor squeezes the containers until the container contents approach their absolute density. The volume of each container is reduced, on average, by a factor of six. The super-compactor is ventilated by the Non-Thermal Area process ventilation system (SB-09). In the event any liquid is generated as a result of super-compacting the containers, the liquids are collected by a pan in the super-compactor chamber.

The liquid is pumped out of the sump, absorbed and added to the final disposal container prior to grouting of the container.

Next, the squeezed containers (referred to as pucks) are taken out of the super-compactor and placed inside an overpack container (drum or a box constructed of steel or polyethylene) already containing a layer of grout. When the overpack container is filled with a sufficient number of pucks, the void spaces are filled by a grout mixture. After allowing the grout in the overpack container to be cured, the container is capped and welded shut to form a continuous seal and sent to waste container storage or inspected for shipment off-site. TP-07 (except for the super-compactor) is a portable process and activities may take place in multiple areas within the MWF (See Table 4-12). The super-compactor is located in Room SB-08. TP-07 may be used to process TSCA-regulated wastes.

***TP-10 – Extraction System:** The function of the extraction system TP-10 is to decant/separate liquids from solid wastes and also perform the treatment activities of solvent extraction, chemical oxidation (CHOXD), chemical reduction (CHRED), deactivation (DEACT), precipitation (PRECP) or washing/rinsing. Operations conducted by this system include: receiving containerized waste, receiving various reagents, separating liquids from the solid waste via decanting/pumping, washing the solids with appropriate solutions, grouting the washed solids, closing the waste containers and transporting the filled containers to a waste storage area. For washing operations, this system is used to decant/pump out liquids followed by washing and rinsing of solids and decanting/pumping out of the solutions. The treated or washed solids are placed into containers which are grouted (or undergo further treatment), capped and transported a containerized waste storage or inspected for shipment off-site. The extraction system uses two electric mixer units mounted on to mobile steel frames equipped with pumps, instrumentation, and controls. A mixer is shown on drawing DWG-TP10-001. After a waste containing a mixture of solids and liquids is received in the mixer, decanting is accomplished by tilting the extraction unit to a position angled from the vertical. A screen may be secured to the mixer opening to allow the liquids to drain into a container while the solids are retained inside the mixer.

Batches of incoming solid/liquid TSCA-regulated PCB waste (DU chips or metal turnings, for example) are treated by washing the solids in the two extraction mixers. Before washing, liquids will be decanted off of the solids and tested for PCB content, containerized and shipped off-site for disposal as appropriate. Following washing and the decanting off of the first washing solution, the waste is stored on-site until the solids are transferred to the second extraction mixer for the second washing step. [One mixer is dedicated for the first wash or high concentrations of PCBs. The second mixer is dedicated for the second wash, or low concentrations of PCBs.] The wash liquids are tested for PCB content and either recycled within the system for use again or containerized and shipped off-site for appropriate disposal. During the washing/rinsing activities when the mixer is agitating the solid/liquid mixture, a lid is closed over the opening of the mixer, preventing emissions.

The extraction system (TP-10) also includes one grout mixer. The grout mixing unit is not a RCRA or TSCA regulated unit since it will be used for mixing appropriate raw materials to produce a grout. No waste materials will be handled in the grout mixer.

If the treated waste is a pyrophoric material, the material may be covered in mineral oil before further treatment. The mineral oil will later be removed and retained for further use as practicable and the treated waste may be further treated. If grouting of the wastes is going to occur, the solids will be transferred to a final disposal container already containing grout on the bottom. A grout mixture will then be poured over the solids. After allowing the grout in the container to be cured, the container is capped and transported to a waste container storage area for inspection for shipment off-site. TP-10 is a portable process and activities may take place in multiple areas within the MWF (See Table 4-12). TP-10 may be used to process TSCA-regulated wastes. Non-TSCA-regulated PCB wastes and non-PCB wastes can also undergo treatment in these two extraction mixers. If TSCA-regulated wastes are treated in the mixers, they will be cleaned by either triple rinsing or double wash/rinse procedure prior to processing non-TSCA wastes.

***TT-01 – High-Capacity Mixing System:** Wastes will be stabilized (STABL) in the high-capacity mixing system to meet the LDR treatment standards. This system is shown on drawing DWG-STB-GA-TT01-001. This stabilization will be performed by mixing solid or liquid wastes with reagents, such as cement, fly ash, or polymers in the high-capacity mixing system which includes a mixer and two feeders and associated instrumentation and controls mounted on a steel framing assembly. Prior to stabilization, treatability tests will be performed to establish a formulation that ensures the stabilization process will reduce the leachability of toxic and hazardous contaminants in the final product to a level that meets the LDR requirements. The stabilization process chemistry for a given waste stream is designed to transform the contaminants to less soluble/mobile or less toxic forms. After the initial preparation, solid wastes requiring stabilization will be placed in a TIC and weighed. An appropriate amount of reagent, as determined by the pre-established formulation, will be prepared in the bulk reagent system and placed in another TIC. The TIC containing waste will be placed on top of a feeder that discharges the waste into the designated mixer. The TIC containing reagent will be placed on top of another feeder that also discharges the reagent into the designated mixer. When ready, the two feeders will be started to add the waste and the reagent to the mixer. Wastes and reagents may also be added manually into the mixer without the use of the feeders. Next, the mixer will be started to run for a set period of time. When the mixing cycle is complete, the mixture will be discharged into a disposal container. When a mixing batch is complete, the mixer will be cleaned by introducing a predetermined quantity of abrasive solids (such as gravel). The abrasive solids will remove material that has accumulated on the blades or around the mixer housing. When the cleaning cycle is complete, the abrasive solids are discharged on top of the stabilized waste in the disposal container. The mixture in the disposal container is allowed to cure. Next, the waste is checked for compliance with LDR standards and if it passes inspection, it is sent to waste storage or final certification for transportation off-site. Waste not passing the inspection is re-processed by sending it to the size reduction and screening unit (TP-01) and then through the TT-01 process again. TT-01 is a portable process and activities may take place in multiple areas within the MWF (See Table 4-12). TT-01 will not be used to process TSCA-regulated wastes.

TT-02 – Low-Capacity Mixing System: Wastes are stabilized (STABL) in the low-capacity mixing system to meet the LDR treatment standards. This stabilization is performed by mixing solid or liquid wastes with reagents, such as cement, fly ash, or polymers in the low-capacity mixing system which includes a mixer and two feeders and associated instrumentation and controls mounted on a steel framing assembly. Prior to stabilization, treatability tests will be performed to establish a formulation that ensures the stabilization process will reduce the leachability of toxic and hazardous contaminants in the final product to a level that meets the LDR requirements. The stabilization process chemistry for a given waste stream is designed to transform the contaminants to less soluble/mobile or less toxic forms. After the initial preparation, solid wastes requiring stabilization are placed in a TIC and weighed. An appropriate amount of reagent, as determined by the pre-established formulation, is prepared and placed in another TIC. The TIC containing waste is placed on top of a feeder that discharges the waste into the designated mixer. The TIC containing reagent is placed on top of another feeder that also discharges the reagent into the designated mixer. When ready, the two feeders are started to add the waste and the reagent to the mixer. Wastes and reagents may also be added manually into the mixer without the use of the feeders. Next, the mixer is started to run for a set period of time. When the mixing cycle is complete the mixture is discharged into a disposal container. When a mixing batch is complete, the mixer is cleaned by introducing a predetermined quantity of abrasive solids (such as gravel). The abrasive solids remove material that has accumulated on the blades or around the mixer housing. When the cleaning cycle is complete, the abrasive solids are discharged on top of the stabilized waste in the disposal container. The mixture in the disposal container is allowed to cure. Next, the waste is checked for compliance with LDR standards and if it passes inspection, it is sent to waste storage or final certification for transportation off-site. Waste not passing the inspection is re-processed by sending it to the size reduction and screening unit (TP-01) and then through the TT-02 (or TT-01) process again. The low-capacity mixer is ventilated to the Non-Thermal Area process ventilation system (SB-09). TT-02 is located in Room SB-06 of the Non-Thermal Area and will not be used to process TSCA-regulated wastes.

Both the high-capacity and the low-capacity mixing systems use the same basic equipment and processing method for stabilizing solids, with the exception that the capacity of the mixer used in the high-capacity mixing system is larger than the mixer used in the low-capacity system. The selection of a mixing system is made by the operator based on the overall workload at the facility and the quantity of waste to be processed in the given processing campaign or batch.

***TT-03 – In-Container Mixing System:** This system will be used to provide in-container neutralization (NEUTR), stabilization (STABL), chemical oxidation (CHOXD), chemical reduction (CHRED), deactivation (DEACT), or precipitation (PRECP) by mixing liquid, slurry, or solid wastes in a container that serves both as the mixing vessel and the final disposal container. Operations conducted by this system will include: 1) receiving containerized waste, 2) receiving reagents, 3) mixing waste with reagents, 4) capping treated waste containers, and 5) transporting filled containers to containerized waste storage or inspection for shipment off-site.

The in-container mixing system includes portable in-container mixer unit that uses a mixer blade mounted on a vertical telescoping shaft as shown on drawing DWG-STB-GA-TT01-001. A drum-loading flange seals the container during stabilization and mixing operations. Emissions from the container are routed to the Non-Thermal Area process ventilation system (SB-09). Mixing is accomplished inside a portable enclosure. The system is designed to mix waste with reagents either in 55-gallon drums or larger cylindrical containers. Batches of incoming solid, slurry, or liquid wastes are either removed from a TIC and placed into a container, or the original waste container serves as the mixing container. The wastes are pretreated in the container in accordance with requirements established by the treatability tests. The mixing is accomplished by placing the waste container under the mixing station, clamping down the container, lowering the mixing blade and loading flange to mate and seal with the top of the container, feeding the desired reagent mixture through a feeder or directly to the container while the mixer is turned on, and allowing the mixing to continue until the desired cycle mixing is complete and the mixer is stopped. Since an in-container concept is used, only the mixer blade requires rinsing. The mixer blade is cleaned by rinsing with water and scraping, if necessary. After cleaning is complete, mixer blade is raised out of the container and the container is capped and set aside for storage or for final inspection and shipment off-site.

The TT-03 system also includes a portable drum roller that provides in-container stabilization (STABL) and debris washing. The drum roller is a stand with rollers on which a sealed cylindrical container (up to 110-gallon size) is placed in the horizontal position. In this operation, the wastes are transferred from a TIC to a waste container, or the original waste container is used. The waste is pretreated in the container in accordance with requirements established by the treatability tests. The mixing is accomplished by feeding the desired reagent into the container. The container is then capped and placed horizontally onto the drum-roller. The drum-roller is turned on, and the rotating container tumbles and mixes the contents until the desired cycle mixing is complete. Next, the drum-roller is stopped and the container removed and stored or inspected for shipment off-site. Fugitive emissions from the loading of reagents into the container may be ventilated by a connection to the Non-Thermal Area process ventilation system (SB-09). The containers are closed and sealed while on the drum roller. TT-03 is a portable process and activities may take place in multiple areas within the MWF (See Table 4-12). TT-03 may be used to process TSCA-regulated wastes (except for stabilization treatment).

***TT-05 – Physical Extraction System:** This system provides treatment to bulk metal and non-metal solids by physical extraction method, which is an alternate LDR treatment standard accepted by EPA for wastes classified as "debris." The portable physical extraction system consists of a temporary enclosure, a work table, a turntable/trolley assembly, an abrasive media blasting pump and piping, a re-circulation and filtration unit, and the related accessories as shown on drawing DWG-STB-GA-TT05-001. The physical extraction process is to remove surface contamination. The extraction process is conducted inside the enclosure which is connected to the Non-Thermal Area process ventilation system (SB-09). The system primarily uses CO_2 pellet (dry-ice) abrasive blasting media, but other media such as silica or alumina beads, will be used depending on the nature of contamination. Treated waste is placed in containers and sent to a containerized waste storage area or final inspection for shipment off-site. Abrasive media and contaminants together with rinse spray water are collected in a sump in the booth. The rinse water is recycled through a media filter. The solids and water are separated and the water is returned to the spray system. The filtered solids are collected in a TIC. When full, the TIC is sent to a stabilization process (TT-01, TT-02, or TT-03) for treatment or shipped off-site. Excess liquid produced by the extraction process operation is also transferred to a stabilization system (TT-01, TT-02, or TT-03) or shipped off-site. TT-05 is a portable process and activities may take place in multiple areas within the MWF (See Table 4-12). TT-05 may be used to process TSCA-regulated wastes.

TT-08 – Thermal Desorber System: The Thermal Desorber is a process in which solid waste is fed into an indirectly-fired natural gas burner rotary desorber operating at temperatures up to 1,300 degrees F. Moisture and organic material are thermally desorbed from the solids. This system provides thermal desorption and mercury retorting (RMERC). Solid wastes may be sorted prior to processing in the Thermal Desorber System. Functional and Operational Requirements developed for the system are included as Attachment 4-6. Operation of the Thermal Desorber will be limited to 6,000 hours per year with a maximum feed rate of 350 pounds per hour.

Flue gas generated by the natural gas burners is routed to the Thermal Area building confinement system (GV-22) for filtration. Moisture and organics leave the rotary kiln as a hot gas stream that are further treated through condensers. The desorber chamber is sealed and is kept at a lower pressure relative to the room in order to prevent fugitive emissions of vapors or particulates. The liquid condensate is further treated on-site or is shipped off-site for treatment/disposal. Remaining vapor constituents in the off-gas are treated by the Thermal Desorber off-gas treatment systems and then are routed to the Thermal Area building process ventilation system (GV-09) and then to the Thermal Area building confinement system (GV-22). The solids in the kiln are removed and cooled, and are further processed and disposed of as appropriate. TT-08 is located in Room MWT-02 in the Thermal Area and will not be used to process TSCA-regulated wastes.

Specific operational procedures are documented in a series of Mixed Waste Thermal Operational Procedures (MWOP) maintained and updated by the facility. The MWOPs describe the startup, operation and shutdown of the Thermal Desorber System as well as required actions to take under unusual or alarm operating conditions. Inspection activities to be completed during Thermal Desorber System operations are also documented in the MWOPs. Examples of parameters monitored during the operation of the Thermal Desorber are included as Attachment 4-7. Operators and supervisors of the Thermal Desorber System are required to follow all procedures as described in the appropriate MWOP. The following MWOPs are used for the operation of the Thermal Desorber at the facility:

- MWOP 501 – Response Guide to Emergency & Off-Normal Events
- MWOP 502 – Facility Log Sheets (Monitoring Activities)

- MWOP 503 – Alarm Response
- MWOP 506 – Rotary Thermal Desorber (RTD) System Operation
- MWOP 510 – Thermal Desorber System Operations and Maintenance Manual

Although the system does not combust wastes, the Thermal Desorber is equipped with an Automatic Waste Feed Cut Off (AWFCO) system to stop wastes from entering the kiln. The waste feed stream into the Thermal Desorber system is stopped automatically upon a receipt of any one of several different AWFCO signals. Examples of conditions that initiate an AWFCO include:

- Positive pressure differential between the feed hopper and the kiln chamber not maintained.
- Negative pressure differential between the kiln and the room not maintained.
- High temperature in the vapor exhaust.
- High temperature in the flue gas.
- High temperature in the condensate recirculate tank.
- Natural gas burners are not firing.

An AWFCO causes the following to occur: the solid waste feed valve closes and prevents waste from being fed, the feed auger is stopped and all of the Thermal Desorber burners are shut off.

Additional details and engineering specifications, mass and energy balances and burner calculations are included as Attachment 4-8, 4-9 and 4-10, respectively.

***TT-09 – Mercury Amalgamation System:** The Mercury Treatment System is used to treat elemental mercury, mercury-contaminated liquids, resins and soluble salts and insoluble mercury salts, soils and sludges. The treatment processes Mercury Amalgamation (AMLGM) and stabilization (STABL) will be performed at both the bench-scale and bulk-scale level. The system is comprised of two (2) 100-gallon capacity containers, a bulk amalgamation vessel, a mixer, small containers for bench-scale amalgamation, and other ancillary equipment. Bulk mercury amalgamation equipment is shown in drawing DWG-STB-GA-TT09-001. All mercury treatment equipment units are portable units that will be used in an enclosure or glove-box, both of which will be vented to an impregnated carbon filter. After the carbon filter, the process is vented to the Non-Thermal Area process ventilation system (SB-09) when the enclosure or glove box is in use.

The bench-scale mercury amalgamation and stabilization treatment processes for small quantities of wastes are performed in bench-scale mercury treatment equipment which includes a bench-top catch pan, a tumbler, small containers for mixing, and various amalgamation and stabilization reagents. If waste poses a danger to the personnel, the bench –scale mercury amalgamation will be performed in a portable glove box.

For both bench-scale and bulk-scale mercury amalgamation, waste contaminated with greater than 260 ppm total mercury is brought to this system for amalgamation. The waste is removed from the TIC or original waste container and placed into the appropriate-sized treatment vessel or container. The waste is mixed with an amalgamating reagent and then with supplemental amalgamation and/or stabilization reagents. The containers are used to perform solids/liquids separation of mercury-bearing aqueous wastes. The mixer (or small container for bench-scale) is used to stabilize (STABL) mercury contaminated soils, sludges and various types of solid debris and to perform bulk amalgamation. The treated waste is then containerized and transferred to waste storage until compliance with Universal Treatment Standards (UTS) is confirmed. The treated waste then undergoes final inspection and is shipped-off site. TT-09 is a portable process and activities may take place in multiple areas within the MWF (See Table 4-12). TT-09 may be used to process TSCA-regulated wastes. Mercury Amalgamation process will be considered treatment in containers.

***TT-10 – Debris Washing System:** The Debris Washing system will be used to perform debris washing in 55-gallon drums or in a multi-compartment cleaning vat system. Both systems are shown on drawing DWG-STB-GA-TT10-001. Debris washing in 55-gallon drum will be performed using a skid mixer. Appropriate solvent will be placed into the drum containing the debris. Then the drum will be clamped into place on the skid mixer. The mixing impeller will be lowered into the drum and will mix and agitate the debris and solvent to ensure good contact between the solvent and debris. The impeller will be then raised and the drum moved off of the skid. After washing the debris, the wash solvent will be separated from the debris by either use of a perforated screen, or by gravity separation.

The multi-compartment cleaning vat will be a portable unit with a basket and hoist system, a four-compartment vat with covers and discharge tray. The four compartment vat fabricated of stainless steel provides two solvent cleaning compartments, one water/detergent solution cleaning compartment, and one compartment with inclined perforated discharge drip plate. Debris will be loaded into the basket and raised by the hoist and then lowered into the vat. After the basket is lowered into the first vat compartment, the lid will be closed. After the prescribed amount of time, the lid will be opened and the basket will be removed from the first vat compartment and placed into the second vat compartment. This process will be repeated for the third vat compartment. The debris will be emptied from the basket onto the forth compartment with a perforated discharge tray in order to separate the debris from the liquids. The liquids are reused or containerized and transported to the appropriate system for further treatment, as appropriate. After washing is complete, the debris will be collected in a TIC and sent to further treatment, if necessary, or placed into a container. The container will be transported to a waste storage area or inspected for shipment off-site. The wash liquids will be recycle back into the wash system as appropriate. When the liquids can no longer be used, they will be treated further or containerized and transported to a waste storage area or inspected for shipment off-site. TT-10 is a portable process and activities may take place in multiple areas within the MWF (See Table 4-12). TT-10 may be used to process TSCA-regulated wastes.

For units that may handle TSCA-regulated materials, if TSCA-regulated (i.e. PCB) waste is treated, the equipment will be triple rinsed after the PCB campaign with an appropriate solvent in the amount of at least 10% by volume of the equipment capacity. Alternatively, a double wash/rinse procedure may be followed. Such rinsate will be containerized and further used, treated on-site, or sent off-site to a TSCA-permitted facility.

*Note that for units which are portable, the process is vented to the Non-Thermal Process Ventilation System (SB-09) when they are located on the Non-Thermal side of Building 13 and is vented to the Thermal Process Ventilation System (GV-09) when they are located on the Thermal side of Building 13.

4.9.5 Treatment Activities - Ventilation Systems

Non-Thermal Area Process Ventilation System (SB-09) and

Non-Thermal Area Building Ventilation System (SB-02)

Prior to starting a process operation, process ventilation to the system is established and confirmed. The Non-Thermal Area process ventilation system (SB-09) for activities in the Non-Thermal Area provides airspace confinement of waste-bearing equipment and maintains such equipment at a negative air pressure relative to the immediate room environment. SB-09 includes HEPA filters and carbon bed filters. The exhaust from SB-09 is discharged through and treated by the Non-Thermal Area building ventilation system (SB-02). [i.e. all air and emissions ventilated and treated by SB-09 are also then treated by SB-02]. SB-02 provides for general ventilation and air exchanges for the Non-Thermal Area of Building 13 and includes additional HEPA and carbon bed filters. The exhaust from SB-02 exits the building via the Non-Thermal Area building stack.

Thermal Area Process Ventilation System (GV-09) and

Thermal Area Building Ventilation System (GV-22)

Prior to starting a process operation, process ventilation to the system is established and confirmed. The Thermal Area process ventilation system (GV-09) for activities in the Thermal Area provides airspace confinement of waste-bearing equipment and maintains such equipment at a negative air pressure relative to the immediate room environment. Local differential pressure alarms provide the operator with a positive indication that the process ventilation system is operating. GV-09 includes HEPA filters and carbon bed filters. The exhaust from GV-09 is discharged through and treated by the Non-Thermal Area building ventilation system (GV-22). [I.e. all air and emissions ventilated and treated by GV-09 are also then treated by GV-22]. GV-22 provides for general ventilation for the Thermal Area of Building 13 and includes additional HEPA and carbon bed filters. The exhaust from GV-22 exits the building via the Thermal Area building stack. These two systems are located in Room MWT-03 in Building 13.

For processes that are portable and may be moved and operated in multiple rooms within Building 13, the process ventilation system used will depend if the process is in the Non-Thermal Area or in the Thermal Area. If the process description above noted that the equipment was ventilated by SB-09 (while located in the Non-Thermal Area), when the process is operational in the Thermal Area, it will be ventilated by GV-09. Likewise, If the process description above noted that the equipment was ventilated by SB-02 (while located in the Non-Thermal Area), when the process is operational in the Thermal Area, it will be ventilated by GV-22.

4.9.6 Non-Treatment Activities

Rooms SB-02, SB-03, SB-05, SB-06, SB-07, SB-08, SB-09 and SB-11 in the Non-Thermal Area and Rooms MWT-01, MWT-02, MWT-04 in the Thermal Area may also be used to perform non-treatment activities including; repackaging, inspection, sampling/fingerprinting, sorting (TP-13), decontamination, and grout preparation activities. Inspection, sampling/fingerprinting, pre-sorting and transfer activities may also take place in Room SB-04. Inspection operations include opening the container, conducting a visual inspection and, if necessary, obtaining a sample from the waste. Presorting and transfer operations may include removing the waste overpack material or transferring waste materials to a transportable in-process container (TIC). After inspection, sample collection, or transfer of waste material in or out of a container, the container is closed. These activities do not meet the definition of hazardous waste treatment as defined by 40 CFR 260.10. Therefore, these processes are not included in the Part A application.

4.9.7 Non-Treatment Activity Ventilation

For non-treatment activities and for treatment activities that may be performed in multiple locations as described above, waste will be transported utilizing various container transport equipment and processing equipment, as required to perform the task(s). For some of these non-treatment activities, a temporary containment system(s) (TCS) described below may be used as required to perform the task(s).

The criteria to use a TCS are largely driven by the radiological characteristics of the waste and the physical size of the waste. A TCS may be used for processing items which cannot physically managed in other areas of the MWF and to control/mitigate radiological fugitive emissions which are regulated pursuant to WAC 246-247. Typically, TCSs are constructed of PVC piping and poly-sheeting. The PVC piping serves as the support structure and poly-sheeting is attached to create the floor, walls and roof. If necessary for proper air flow, the TCS structures will be connected to a portable HEPA ventilation unit. The exhaust flow from the TCS will be connected to the process ventilation system SB-09 (if located in the Non-Thermal Area) or GV-09 (if located in the Thermal Area).

For any non-treatment activity that requires a waste container to be opened, the area, TCS, or room where the activity is performed will be ventilated by a process ventilation system. Either the Non-Thermal Area process ventilation system (SB-09) or the Thermal Area process ventilation system (GV-09) will be used, which ever is more practicable based on the activities physical location in the MWF. Flexible connections may be used to connect a TCS or equipment to a process ventilation system as needed. In addition to the process ventilation systems used to collect any emissions from an open container, the building is kept at negative pressure relative to outside by the building ventilation systems (SB-02 and GV-22). Thus, any emissions from non-treatment activities involving the opening of a container are collected by either a process ventilation or building ventilation system.

4.10 D-8 Air Emissions Control [D-8]

[WAC 173-303-806(4)(j) and (k), WAC 173-303-110 (test methods), WAC 173-303-690, WAC 173-303-691, 40 CFR 270.24, 40 CFR 270.25, 40 CFR Part 264 Subparts AA, BB, and CC]

4.10.1 Process Vents [D-8a]

[WAC 173-303-806(4)(j), WAC 173-303-110, WAC 173-303-690, 40 CFR 270.24, 40 CFR 264.1030 - 264.1035 (Subpart AA)]

Subpart AA, Air Emission Standard for Process Vents, applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10 percent by weight.

4.10.1.1 Applicability of Subpart AA Standards [D-8a(1)]

[WAC 173-303-690, 40 CFR 270.24(b), 40 CFR 264.1030(d), 40 CFR 264.1035(b)(2)]

4.10.1.1.1 Process Vents Subject to AA Standards [D-8a(1)(a)]

Only one process (TP-10) could potentially be subject to Subpart AA requirements based on the treatment process that could take place in this unit (solvent extraction). However, this process unit does not have any vents associated with it that meet the definition of "process vent" as described by 40 CFR 264.1031. Therefore, there are no affected vents at the MWF that are subject to Subpart AA. This subsection is not applicable.

4.10.1.1.2 Process Vents Not Subject to AA Standards [D-8a(1)(b)]

The MWF does not have any vents that meet the definition of "process vent" as described by 40 CFR 264.1031. Therefore, there are no affected vents at the MWF that are subject to Subpart AA. This subsection is not applicable.

4.10.1.1.3 Re-evaluating Applicability of Subpart AA Standards [D-8a(1)(c)]

[WAC 173-303-690, 40 CFR 270.24(b)(3), 264.1030]

The applicability determination of Subpart AA will be re-evaluated whenever there is a change in the unit or a change in the process that generates or treats the waste.

4.10.1.2 Process Vents - Demonstrating Compliance [D-8a(2)]

[WAC 173-303-806(4)(j), WAC 173-303-110, WAC 173-303-690, 40 CFR 270.24, 40 CFR 264.1030 - 264.1035]

There are no affected vents at the MWF. Therefore, this subsection is not applicable.

4.10.1.2.1 The Basis for Meeting Limits/Reductions [D-8a(2)(a)]

[WAC 173-303-806(4)(j)(ii), WAC 173-303-110, WAC 173-303-690, 40 CFR 270.24(b), 40 CFR 264.1032, 40 CFR 264.1034(c), 40 CFR 264.1035(b)(2) and (b)(3)]

There are no affected vents at the MWF. A basis for meeting the Subpart AA emissions limits or reductions is not required. Therefore, this subsection is not applicable.

4.10.1.2.2 Demonstrating Compliance via Selected Method [D-8a(2)(b)]

[WAC 173-303-806(4)(j)(ii), WAC 173-303-110, WAC 173-303-690, 40 CFR 270.24(b), 40 CFR 264.1032, 40 CFR 264.1034(c), 40 CFR 264.1035(b)(2) and (b)(3)]

There are no affected vents at the MWF. Demonstrating compliance with a basis for meeting the Subpart AA emissions limits or reductions is not required. Therefore, this subsection is not applicable.

4.10.1.2.3 Design Information and Operating Parameters for Closed Vent Systems and Control Devices [D-8a(2)(c)]

[WAC 173-303-806(4)(j)(iv), WAC 173-303-110, WAC 173-303-690, 40 CFR 270.24(d), 40 CFR 264.1032(b), 40 CFR 264.1033, 40 CFR 264.1034, 40 CFR 264.1035(b)(3) and (b)(4), 40 CFR 264.1035(c)]

There are no affected vents at the MWF. Therefore, this subsection is not applicable.

4.10.1.2.4 Re-evaluating Compliance with Subpart AA Standards [D-8a(2)(d)]

[WAC 173-303-806(4)(j)(ii), WAC 173-303-690, 40 CFR 270.24(b), 40 CFR 264.1030, 40 CFR 264.1035(b)(2)]

There are no affected vents at the MWF. Therefore, this subsection is not applicable.

4.10.2 Equipment Leaks [D-8b]

[WAC 173-303-806(4)(k), WAC 173-303-110, WAC 173-303-690, WAC 173-303-691, 40 CFR 270.25, 40 CFR 264.1050 - 264.1064, 40 CFR 264.1033, 40 CFR 264.1034(c), 40 CFR 264.1035(b) and (c)]

Subpart BB, Air Emission Standards for Equipment Leaks, applies to equipment that contains or contacts manage hazardous wastes with organic concentrations of at least 10 percent by weight.

4.10.2.1 Applicability of BB Standards [D-8b(1)]

[WAC 173-303-806(4)(k), WAC 173-303-691, WAC 173-303-110, 40 CFR 270.25, 40 CFR 264.1050, 40 CFR 264.1063]

4.10.2.1.1 Equipment Subject to Subpart BB [D-8b(1)(a)]

Equipment as defined in 40 CFR 264.1031 includes each valve, pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, or flange or other connector. All equipment associated with the condensed liquid lines from the Thermal Desorber System (TT-08) and Tank T-310 may contact liquids containing at least 10 percent by weight organic content and is subject to Subpart BB standards. All equipment associated with the Thermal Desorber system and subject to Subpart BB will be located in Room MWT-02 in the MWF. This equipment is shown on the Subpart BB drawing 32004-PID-201 and 32004-PID-300 included in Section 6 and also Section 12.

No other units with equipment subject to Subpart BB will accept waste with an organic content of at least 10 percent by weight. The organic content of wastes will be measured using one of the methods listed in 40 CFR 264.1063(d), as described in the MWF's Waste Analysis Plan.

4.10.2.1.2 Re-evaluating the Applicability of Subpart BB Standards [D-8b(1)(b)]

[WAC 173-303-691(1), WAC 173-303-110, 40 CFR 264.1063(d) - (g), 40 CFR 264.1064(k)]

A review of the applicability of Subpart BB will occur if operating records indicate that the concentration of organics in waste entering equipment currently not regulated under Subpart BB exceeds 10 percent by weight; or a proposed change in operating procedures that would allow processing of wastes with organic contents of greater than 10 percent by weight. Records of testing conducted to determine Subpart BB applicability will be kept in the operating record. The organic content of wastes will be measured using one of the methods listed in 40 CFR 264.1063(d).

4.10.2.2 Equipment Leaks - Demonstrating Compliance [D-8b(2)]

4.10.2.2.1 Procedures for Identifying Equipment Location and Method of Compliance, Marking Equipment, and Ensuring Records are Up-to-date [D-8b(2)(a)]

[WAC 173-303-806(4)(k), WAC 173-303-691, 40 CFR 270.25, 40 CFR 264.1050 - 264.1064]

The process containing equipment subject to Subpart BB (Thermal Desorber) is located in the Thermal Area of Building 13shown on drawing PERMAFIX-DWG-GVB-GA-FAC-001. Each piece of equipment subject to Subpart BB will be identified in the process unit by attaching an equipment identification tag. The identification tag will be easily visible in order to distinguish it readily from other equipment and constructed of a durable material.

Procedures for identifying equipment location and method of compliance, marking equipment, and ensuring records are up-to-date are also described in the Inspection Plan. The Inspection Plan will be updated as necessary as equipment is installed. The Inspection Plan is included as part of this application.

The following information for each piece of equipment subject to Subpart BB will be recorded in the facility operating record:

- Equipment identification number and hazardous waste management unit identification

- Location of associated hazardous waste management unit on facility drawing
- Equipment type
- Range of percent-by-weight total organics in the hazardous waste stream at the inlet to the equipment
- Physical state (e.g., gas/vapor or liquid) of the waste at the inlet to the equipment
- Method of compliance (e.g., either monthly leak detection and repair or dual mechanical seals) with the standard

The facility has procedures to establish and update a log as part of the facility operating record with a list of equipment identification numbers for:

- Equipment subject to standards in 40 CFR 264.1052 through 40 CFR 264.1060
- Pressure relief devices required to comply with 40 CFR 264.1054
- Equipment in vacuum service as required by 40 CFR 264.1064[2]
- Valves subject to 40 CFR 264.1057(g) and (h) that are designated as unsafe to monitor under 40 CFR 264.1064(h)(1) including:
    - The valves identification number
    - Explanation of why the valve is unsafe to monitor
    - The plan form monitoring the valve
- Valves subject to 40 CFR 264.1057(g) and (h) that are designated as difficult to monitor under 40 CFR 264.1064(h)(2)
    - The valves identification number
    - Explanation of why the valve is difficult to monitor
    - The plan form monitoring the valve
- Equipment designated for "no detectible emissions" under 40 CFR 264.1052(e), 40 CFR 264.1053(i) and 40 CFR 264.264.1057(f)
    - "No detectible emission" designations will be signed by the owner or operator
    - As applicable, the results from the most recent compliance tests required under 40 CFR 264.1052(e), 40 CFR 264.1053(i) and 40 CFR 264.264.1057(f)

The facility's Inspection Plan includes procedures to establish and update a log as part of the facility operating record that will include for each pump and compressor;

[2] Although a list of vacuum equipment is required, 40 CFR 264.1050(e) states that such equipment does not have to comply with standards in 40 CFR 264.1052 through 40 CFR 264.1059.

- The criteria that indicates failure of the seal system, the barrier fluid system, or both, and changes to these criteria, including reasons for the changes

The facility's Inspection Plan includes procedures to establish and update inspection logs that include equipment subject to Subpart BB and identification and repair of leaking equipment.
In addition, for equipment determined to be exempt from the Subpart BB requirements, the following information will be kept in the operating record:

- The design capacity of the hazardous waste management unit
- The hazardous waste influent and effluent for each hazardous waste management unit and determination of whether these hazardous wastes are heavy liquids
- Other supporting documentation and information used in making the exempt determination

4.10.2.2.2 Demonstrating Compliance with D-8b(1)(a) and (2)(a) Procedures [D-8b(2)(b)]

[WAC 173-303-806(4)(k), WAC 173-303-691, 40 CFR 270.25, 40 CFR 264.1050 – 264.1059]

This permit application has demonstrated compliance with the procedures as described in the previous two subsections of this document by providing the following.

A description and location of units to which Subpart BB applies. Process descriptions of the Thermal Desorber located in Room MWT-02 is included in the "Process Description Details" subsection of this application.

The logs and lists and other documentation required to be part of the facility's operating record and updated as necessary are described in the facility Inspection Plan.

4.10.2.2.3 Closed Vent Systems or Control Devices: Showing Compliance with Emission Reduction Standards [D-8b(2)(c)]

[WAC 173-303-806(4)(k), WAC 173-303-110, WAC 173-303-690, WAC 173-303-691, 40 CFR 270.25, 40 CFR 264.1033-264.1035, 40 CFR 264.1052-264.1055, 40 CFR 264.1059, 40 CFR 264.1060, 40 CFR 264.1063]

Equipment associated with the Thermal Desorber System (TT-08) (i.e. equipment subject to Subpart BB) does not include closed vent systems or control devices as defined by 40 CFR 264.1031. Therefore, this subsection is not applicable.

4.10.3 Tanks and Containers [D-8c]

[40 CFR 270.27, 40 CFR 270.15, 40 CFR 270.16, 40 CFR 264 Subpart CC]

4.10.3.1 D-8c(1) Applicability of Subpart CC Standards [D-8c(1)]

[40 CFR 264.1080, 40 CFR 264.1082]

Waste management unit that is used solely for the management of radioactive mixed waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act are exempted from the requirements of this subpart by 40 CFR 264.1080(b)(6). All hazardous wastes managed at the MWF are radioactive mixed waste and are managed in accordance with these regulations. Therefore this subsection is not applicable.

4.10.3.2 Tanks Systems and Container Areas - Demonstrating Compliance [D-8c(2)]

[40 CFR 270.27(a)(1) - (a)(3) and (a)(5) - (a)(6)]

All tanks and containers are exempted from Subpart CC by 40 CFR 264.1080. Therefore this subsection is not applicable.

4.11 Waste Minimization [D-9]

[40 CFR 264.73(b)(9), 40 CFR 264.75(h) and (i)]

The MWF has developed and implemented a waste minimization program that encompasses both the management and treatment of mixed waste and the administrative side of the facility's operations. Specific procedures to reduce the volume and toxicity of hazardous waste generated by treatment operations is evaluated and instituted on a case-by-case basis. The waste minimization program will be reviewed and certified annually as required by 40 CFR 264.73(b)(9).

<u>Unloading</u>

Caution is used to avoid spills when unloading liquid wastes to the MWF. By minimizing the frequency/volume of spills, subsequent remediation activities are not necessary and therefore no secondary waste is generated.

<u>Waste Treatment Operations</u>

Waste minimization is an inherent component of many of the MWF's treatment processes and is the primary purpose of the facility. Treatment formulations are optimized to minimize the use of additives and reagents, thereby minimizing the volume of secondary wastes generated.

Secondary wastes generated on site, wherever possible, are recycled, treated on site, or reduced in volume before shipment off site. The following activities will be implemented to minimize waste generated by treatment operations at the facility:

- Rinse water used to flush treatment units will be used as long as practicable, before being placed in a TIC for on site treatment or off site disposal.
- Extraction System solvents are reused as long as practicable.
- Debris Washing System solvents are reused for as long as practicable.
- Physical Extraction System primarily uses frozen carbon dioxide pellets as the abrasive blasting media. The carbon dioxide sublimates after use and does not contribute to the volume of generated secondary wastes.
- In-container treatment is used where practicable. This eliminates the need to rinse and/or wash additional treatment equipment and generate secondary waste.
- Scrubber reagents are used to their full potential, minimizing the amount of reagent waste.

Office/Administration/Break Areas

A recycling program is in effect on site to segregate materials that contain recyclables into separate containers. This includes paper, cardboard, and aluminum. The recyclable materials are collected and taken to a local community recycling collection center.

Waste Minimization Certification

Perma-Fix Northwest Richland, Inc. (PFNW-R) owns and operates a mixed waste facility (MWF) located at 2025 Battelle Boulevard in Richland, Washington. The MWF is a treatment and storage facility for radioactive Resource Conservation and Recovery Act (RCRA) waste and radioactive Toxic Substance Control Act (TSCA)-regulated Polychlorinated Biphenyls (PCBs) waste.

PFNW-R has in place a program to reduce the volume of hazardous waste it generates within its daily operations. The program will remain in effect as long as PFNW-R operates under full permit.

Certification Signature

Vice President and General Manager

5/10/11

Date

SECTION 4

PROCESS INFORMATION

Attachment 4-1
Floor Coating Technical Data

MIXED WASTE FACILITY
RCRA/TSCA PERMIT APPLICATION

PERMA-FIX NORTHWEST RICHLAND, INC.

RICHLAND, WASHINGTON