Y-12

Y/TS-104/R1

**OAK RIDGE
Y-12
PLANT**

MARTIN MARIETTA

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**ENVIRONMENTAL STANDARDS FOR
PRIMARY AND SECONDARY
CONTAINMENT SYSTEMS
AND TRANSFER STATIONS**

April 1995

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MASTER

Revised by D. M. Maguire

Prepared by

Water Compliance Section
Environmental Management Department
Health, Safety, Environment, and
Accountability Division
Oak Ridge Y-12 Plant
Oak Ridge, Tennessee 37831
managed by

LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the

U.S. DEPARTMENT OF ENERGY
Under Contract DE-AC05-84OR21400

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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OVERVIEW

Environmental Standards for Primary and Secondary Containment Systems and Transfer Stations will supersede all previous requirements for design of dikes, storage tanks, and transfer stations in order to maintain consistency throughout the Y-12 Plant. This document is organized into six distinct sections, each with a specific purpose.

Section I outlines the objectives of the document along with its applications and limitations; this section should be of interest to all readers for essential background information. Section II lists all definitions and is consistent with definitions outlined by environmental regulations. Section III discusses primary containment standards.

Section IV outlines secondary containment standards; this section contains the actual standards for the diking of storage tanks and storage containers. Section V discusses transfer station standards. Section VI of this document outlines how exemptions may be granted for specific cases.

I. PURPOSE, SCOPE, AND APPLICABILITY

This document provides specific technical requirements for container and tank storage units that contain waste and product materials. The standards of this document were developed to achieve four objectives. First, the standards were developed in order to codify design requirements for storage units that will prevent the release of regulated materials due to leaks, spills, or other storage system failures. Second, the standards specify containment and control design requirements intended to prevent any released material from reaching waters of the state of Tennessee. Third, the standards were developed to ensure compliance with the relevant regulatory requirements of the Clean Water Act (CWA), Resource Conservation and Recovery Act (RCRA), and Toxic Substances Control Act (TSCA). Finally, the standards were developed to ensure consistency throughout the Y-12 Plant for the design and construction of container and tank storage units.

For indoor hazardous material and petroleum product storage areas, the standards are applicable on a case-by-case basis. The standards shall be followed for those indoor tank systems that have any means by which spilled material may escape the building in which the material is being stored. For other indoor storage areas, these standards represent good engineering practices designed to prevent the discharge or release of regulated materials; therefore, they should be followed as closely as possible. In general, indoor facilities should be designed to prevent the discharge of hazardous or toxic pollutants into drains or storm sewers which discharge to receiving waters. For flammable and combustible liquids, Fire Protection Engineering personnel should be consulted to ensure that applicable codes of the National Fire Protection Association (NFPA) are considered. The extent to which this document will apply to indoor facilities will be determined by the Environmental Management Department staff based upon (1) relative toxicity or hazard of material, (2) closeness to creek or storm sewers, (3) potential of contents reaching creek or storm sewer, (4) frequency of operation, and (5) volume of material present.

II. DEFINITIONS

Aboveground tank - A device meeting the definition of "tank" in §260.10 and that is situated in such a way that the entire surface area of the tank is completely above the plane of the adjacent surrounding surface and the entire surface area of the tank (including the tank bottom) is able to be visually inspected. (40 CFR 260.10)

Ancillary equipment - Any devices such as piping, fittings, flanges, valves, and pumps that are used to distribute, meter, or control the flow of hazardous waste from its point of generation to a storage or treatment tank, between hazardous waste storage and treatment tanks to a point of disposal on site, or to a point of shipment for disposal off site. (40 CFR 260.10)

Best Management Practices (BMP) - Existing requirements applicable to all dischargers who use, manufacture, store, handle, or discharge any pollutant listed as toxic under Section 307 of the CWA as amended in 1977 or as hazardous under Section 311 of the CWA for all ancillary manufacturing operations which may result in significant amounts of toxic or hazardous pollutants reaching waters of the United States.

Container - Any "portable device in which a material is stored, transported, treated, disposed of, or otherwise handled." (Ref. 40 CFR 260.10)

Containment volume - The actual volume of a diked or curbed area reduced by the displacement volume of structures within the diked or curbed area.

Dike - An embankment or ridge of either natural or manmade materials used to prevent the movement of liquids, sludges, solids, or other materials. (40 CFR 260.10)

Discharge - The accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of material into or on any land or water. (40 CFR 260.10)

Hazardous/toxic material - Any material used in any production, fabrication, or other process that is or contains any of the substances listed in the following:

40 CFR 116 - List of Hazardous Substances

49 CFR 172 - List of Hazardous Materials

Section 307(a)(1) of CWA - List of Toxic Pollutants

Incompatible materials - A chemical or waste which is unsuitable for:

1. Placement in a particular device or facility because it may cause corrosion or decay of containment materials.
2. Commingling with another chemical or waste under uncontrolled conditions because the commingling might produce heat or pressure, fire or explosion, violent reaction, toxic dust, mist, fumes, gases, or flammable fumes or gases. (40 CFR 260.10)

Inground tank - A device meeting the definition of "tank" in §260.10 whereby a portion of the tank wall is situated to any degree within the ground, thereby preventing visual inspection of that external surface area of the tank that is in the ground. (40 CFR 260.10)

Leak-detection system - A system capable of detecting the failure of either the primary or secondary containment structure or the presence of a release of hazardous waste or accumulated liquid in the secondary containment structure. (40 CFR 260.10)

Onground tank - A device meeting the definition of "tank" in §260.10 and is situated in such a way that the bottom of the tank is on the same level as the adjacent surrounding surface so that the external tank bottom cannot be visually inspected. (40 CFR 260.10)

Operator - The person responsible for the overall operation of a facility. (40 CFR 260.10)

Owner - The person who owns a facility or part of a facility. (40 CFR 260.10)

PCB article - Any manufactured article, other than a polychlorinated biphenyl (PCB) container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. PCB articles include capacitors, transformers, electric motors, pumps, pipes, and other manufactured items. (40 CFR 761.3)

PCB article container - Any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB articles or PCB equipment and whose surface(s) has not been in direct contact with PCBs. (40 CFR 761.3)

PCB container - Any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB articles and whose surface(s) has been in direct contact with PCBs. (40 CFR 761.3)

PCB item - Any PCB article, PCB article container, PCB container, or PCB equipment, that deliberately or unintentionally contains or has as a part of it any PCB or PCBs. (40 CFR 761.3)

Primary containment - Normally the tank or container for hazardous/toxic waste or material.

Secondary containment - A containment system capable of collecting and holding any spills or leaks from a primary containment system.

Tank - A "stationary" device, designed to contain an accumulation of hazardous/toxic waste or material which is constructed primarily of nonearthen materials (i.e., wood, concrete, steel, plastic) which provide structural support. This definition encompasses both open top and closed top tanks. (Ref. 40 CFR 260.10)

Tank system - A product storage, waste storage, or treatment tank and its associated ancillary equipment and containment system. (40 CFR 260.10)

Transfer station - A place or facility where wastes or materials are transferred from collection tanks or containers into waste tankers or transport containers for movement to a storage location, disposal area, or treatment facility. This definition also includes facilities where waste or material is transferred from waste tankers or transport containers into treatment, storage, or disposal facilities.

Underground storage tank - Storage tank(s) and associated connective piping in which at least 10 percent of the total volume of the contained substance is beneath final ground elevation. (40 CFR 280).

III. PRIMARY CONTAINMENT REQUIREMENTS

III.A Aboveground and Onground Tanks

III.A.1 Allowable Corrosion Rates

To ensure compatibility, construction materials for new tank systems shall be selected that demonstrate a low corrosion rate with respect to the material stored therein.

- a. The allowable internal corrosion rate for any tank shall be less than 0.005 inches per year at the design temperature based on continued immersion.
- b. The design shall provide sufficient excess wall thickness to maintain the minimum structurally required thickness when the loss rate of 0.005 inches is considered to occur for a design life of 20 years.
- c. Design documentation must demonstrate that the selected material of construction will experience a loss rate that meets this standard.

III.A.2 Material Compatibility

- a. Materials prohibited in carbon steel tanks shall include the following:
 - (1) Mineral acids including phosphoric acid, nitric acid, and hydrochloric acid
 - (2) Dilute (<80 percent) sulfuric acid and hydrofluoric acid
 - (3) Organic acids
 - (4) Alkalies at service temperatures >120 degrees Fahrenheit and >50 percent concentration
 - (5) Aqueous solutions of chloride, fluoride, hypochlorite, and sulfate salts
 - (6) Halogenated and aromatic organic solvents including but not limited to perchloroethylene, trichloroethane, trichloroethylene, benzene, cresols, and toluene
 - (7) Admixtures consisting of water and oil, petroleum, or organic solvents.
- b. Materials prohibited in stainless steel tanks shall include the following:
 - (1) Dilute solutions (<80 percent) of sulfuric acid
 - (2) Hydrofluoride, hydrochloric, and phosphoric acids
 - (3) Alkaline solutions in Series 400 Stainless Steel (i.e., Type 410 or 430)

- (4) Alkaline solutions of >40 percent concentration and service temperatures of >120 degrees Fahrenheit in Series 300 Stainless Steel
 - (5) Hydrohalic acids
 - (6) Aqueous chloride and hypochlorite salts
 - (7) Admixtures of water and halogenated solvents.
- c. Materials prohibited in high density polyethylene, low density polyethylene, and polypropylene tanks shall include the following:
- (1) Concentrated (>50 percent) sulfuric acid, nitric acid, or perchloric acid
 - (2) Halogenated organic acids
 - (3) Organic solvents including ketones, ethers, aromatic hydrocarbons, aliphatic hydrocarbons, and halogenated aromatic or aliphatic solvents
 - (4) Petroleum-based fuels such as fuel oil, lubricating oil, gasoline, and kerosene
 - (5) Solutions of essential oils (terpenes)
 - (6) Admixtures of water and organic solvents or petroleum derived fuels.
- d. Materials prohibited in polyvinyl chloride (PVC) tanks shall include the following materials:
- (1) Concentrated (>50 percent) oxidizing acids such as nitric, sulfuric, or chromic acids
 - (2) Concentrated (>50 percent) alkalis
 - (3) Concentrated organic acids
 - (4) Petroleum derived fuels
 - (5) Organic bases such as amines, nitriles, and pyridine
 - (6) Organic solvents including ketones, ethers, aliphatic hydrocarbons, aromatic hydrocarbons, acetates, and halogenated aromatic or aliphatic solvents
 - (7) Admixtures of water and organic solvents, fuels, or petroleum derivatives.
- e. Materials prohibited in polyester fiberglass reinforced plastic (FRP) tanks shall include the following:
- (1) Concentrated oxidizing acids such as sulfuric acid (>90 percent), chromic acid (>20 percent), and nitric acid (>50 percent)

(2) Halogenated organic solvents such as methylene chloride, perchloroethylene, trichloroethane, or freons

(3) Aromatic organic solvents such as benzene, toluene, or xylene.

III.A.3 Internal Linings and Coatings

Materials of construction that do not meet the standard of Section III.A.1 must be provided with an internal lining that is compatible with the materials to be stored.

- a. Tanks constructed from plastics or FRP shall not be lined.
- b. Liners shall be professionally applied and maintained. Certification of proper installation shall be obtained from the installer.
- c. After the lining is installed, and prior to use of the tank, the lining thickness and integrity shall be tested and certified. Testing shall be performed by one of the following methods:
 - (1) Dry gauges
 - (2) Electric spark pinhole detectors (10,000-20,000 volts)
 - (3) Dye penetrant techniques
 - (4) Ultrasonic and acoustical emissions techniques
 - (5) Other approved nondestructive inspection methods.

III.A.4 Corrosion Protection

Materials of construction shall be selected for chemical resistance to the stored substance(s) and corrosion resistance to industrial atmospheres.

- a. The design documentation shall include a corrosion potential assessment by a qualified professional engineer. The design must incorporate corrosion protection to address identified corrosion mechanisms.
- b. The interior walls of the tank shall meet the standards of Section III.A.1.
- c. Metallic tank exterior walls shall be coated with compatible corrosion- and chemical-resistant materials which are applied to the surface of the tank.
- d. Exterior coatings shall be chemically resistant to splash and spill exposures to the materials stored in the tank system.
- e. Exterior coatings shall demonstrate good adhesion to the substrate surface.
- f. Exterior coatings shall be ultraviolet (UV) resistant or UV stabilized.

- g. Design specifications shall require proper preparation of the exterior metal walls prior to application of the coatings. At a minimum, the preparatory steps will include alkaline or acid cleaning, conversion coating, and priming.
- h. After application, exterior coatings shall be visually inspected for defects.
- i. The necessity for external lining of an aboveground concrete tank shall be considered in its design. If an exterior coating is required, the coating shall be a glass-flake-filled epoxy or polyester coating, furan resin, or other industry-approved coatings. The coating shall exhibit good adhesion and UV resistance and be impervious to the materials stored in the tank.
- j. External lining of plastic or FRP vessels is not required. Tanks constructed from polyolefin or vinyl plastics, nylon, and FRP shall be UV stabilized.

III.A.5 Structural Integrity

The tank system shall be supported on a base or foundation of adequate structural strength to support the tank system and its contents. Tank walls shall be designed for hoop and axial stress and provide allowances for design safety factors, density of contents, and corrosion.

- a. Aboveground tank systems shall be placed upon a tank stand, saddle, concrete base ring, or concrete pad.
- b. Concrete base rings and foundation pads shall be constructed from a single monolithic pour wherever possible or, if this is not practicable, the design shall be based on a minimum number of adjoining monolithic pours.
- c. The design of concrete base rings and foundation pads shall incorporate techniques to control crack formation including but not limited to the following measures:
 - (1) Use of additional reinforcement beyond that required to attain the minimum required compressive strength
 - (2) Use of sliding dowels and control joints
 - (3) Use of prestressed or posttensioned concrete.

Upon completion of sufficient cure time, all control joints and nonsurficial cracks shall be saw cut and backfilled with a grout or sealant that is resistant to the material that will be stored in the tank system.

- d. All horizontal tanks shall be supported and secured in a properly designed tank saddle that provides uniform support throughout the horizontal axis of the tank.
- e. Tank saddles and stands shall be constructed from materials that are chemically resistant to the materials stored in the tank system. If the tank saddle or stand must be constructed from a noncompatible material, it shall be coated or lined with a chemically resistant lining as specified in Section III.A.2.
- f. Tanks must be anchored or secured in their saddles.

g. The minimum allowable wall thickness for aboveground, atmospheric tanks shall be based on:

- (1) The requirements of UL Standard 142 or
- (2) The calculated hoop and axial stresses.

III.B Underground Tanks

All tank systems shall be designed, constructed, and installed to ensure chemical and corrosion resistance of the inner and outer walls of all components.

III.B.1 Exclusion

Several types of tank systems are excluded from being considered as an underground storage tank (UST). "Exclusion by definition" relieves an owner/operator of compliance with Subtitle I of the RCRA. The following types of tank systems at the Y-12 Plant are excluded:

- a. Tank used for storing heating oil for consumption on the premises where stored
- b. Septic tank
- c. Pipeline facility (including gathering lines):
 - (1) Regulated under the Natural Gas Pipeline Safety Act of 1968 (49 U.S.C. App. 1671, et seq.)
 - (2) Regulated under the Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. App. 2001, et. seq.)
 - (3) Which is an intrastate pipeline facility regulated under state laws comparable to the provisions of the law referred to in paragraph (d) 1. or (d) 2. of this definition.
- d. Surface impoundment, pit, pond, or lagoon
- e. Stormwater or wastewater collection system
- f. Flow-through process tank
- g. Liquid trap or associated gathering lines directly related to oil or gas production and gathering operations
- h. Storage tank situated in an underground area (such as basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

Note: The term "underground storage tank" or "UST" does not include any pipes connected to any tank which is described in exclusions *a* through *h*.

III.B.2 Deferrals

Depending on the specific type of UST, portions of the UST regulation are deferred. A deferral is a release from the responsibility to comply with certain regulatory requirements. The two areas of deferral are outlined below.

a. Release Response and Corrective Action

Certain UST systems must only comply with the "Release Response and Corrective Action for UST Systems" portion of the regulations. This deferral applies to the following types of UST systems:

- (1) Wastewater treatment tank systems
- (2) Any UST systems containing radioactive material that are regulated under the Atomic Energy Act of 1954 (42 U.S.C. 2011 and following)
- (3) Any UST system that is part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR 50, Appendix A
- (4) UST systems with field-constructed tanks
- (5) Equipment or machinery that contains petroleum for operational purposes such as hydraulic lift tanks and electrical equipment tanks
- (6) Any UST system whose capacity is 110 gallons or less
- (7) Any UST system that contains a de minimis concentration of petroleum
- (8) Any emergency spill or overflow containment UST system that is expeditiously emptied after use.

b. Release Detection Exempted

Certain UST systems do not have to comply with the "Release Detection" portion of the regulations. This deferral applies to a UST system that stores fuel solely for use by emergency power generators.

III.B.3 Petroleum and Hazardous Substance UST Systems

The universe of USTs to which these regulations apply can basically be divided into two large categories: new and existing UST systems. A "new" system is one in which installation has commenced after December 22, 1988. An "existing" UST system is one in which installation had commenced on or before December 22, 1988. Distinguishing between a new or existing tank system establishes the regulatory compliance schedule that must be followed.

- a. New tanks and their associated piping are subject to design, construction, installation, operating, and release detection requirements; some of which differ depending on whether the tanks hold petroleum or hazardous substances. The general standard that applies to new tanks is that they must be designed and constructed in a manner that will prevent leaks due to structural failure or corrosion over their useful lives.

The tanks must be constructed from FRP, composite steel/FRP, or coated steel with cathodic protection unless an equivalent design has been approved or noncorrosive soil conditions exist. New tank installations must comply with industry standards (applicable standards are referenced in 40 CFR 280), and the installation must be certified by the installer.

- b. Existing USTs must either be upgraded to meet new tank standards or permanently closed by December 22, 1998. At a minimum, steel tanks must be upgraded by installing an internal liner or cathodic protection; metal piping must be cathodically protected; and spill/overflow prevention equipment must be installed. Release detection systems must be retrofitted to existing tanks over a five-year period that is dependent on the age of the tank. Also, whenever a UST system is temporarily or permanently closed, or when it is converted to some other type of service, strict closure requirements must be met to ensure that no leak has gone undetected and uncorrected.

IV. SECONDARY CONTAINMENT REQUIREMENTS

All facilities that store liquid product or waste materials must be designed and operated with a secondary containment system or have spill containment equipment in the immediate area. The secondary containment system must be capable of collecting releases and accumulated liquids until the collected material is removed. Spill equipment should be capable of containing any spill in as small an area as possible with emphasis on preventing discharges to the storm sewer, sanitary sewer, and East Fork Poplar Creek.

Secondary containment is required for all storage tanks and permanent storage container areas. The CWA requires the Y-12 Plant to operate under an individual National Pollutant Discharge Elimination System (NPDES) permit. As part of the permit, the Y-12 Plant is required under 40 CFR 122.41 to comply with effluent limitations imposed by the permit and to mitigate accidental releases by taking all reasonable steps to minimize or prevent the occurrence of releases. In addition, there are specific requirements of RCRA and TSCA that must be met when storing hazardous and/or toxic materials. Since there are no specific secondary containment requirements for storage of materials other than oil/petroleum products, hazardous materials, or toxic substances, the minimum requirements have been taken from RCRA and shall be applied to all nonregulated storage tanks and containers. The RCRA requirements were adopted because they represent good engineering practices which will minimize the possibility of a release to the environment. If all the secondary containment requirements cannot be met, the owner/operator must apply for an exemption from the part(s) that cannot be met as outlined in Section VI.

IV.A Applicable Standards and Codes from the CWA

- Requirements for preparation and implementation of Spill Prevention Control and Countermeasure (SPCC) Plans (40 CFR 112.3)
- Guidelines for the preparation and implementation of an SPCC Plan (40 CFR 112.7)
- Permit conditions (40 CFR 122.41, Subpart C)
- Permit terms and conditions for BMPs (40 CFR 125.103, Subpart K)
- BMP programs (40 CFR 125.104, Subpart K)

This section is to be applied to all storage facilities that do not fall under RCRA or TSCA regulations. RCRA storage areas are covered under Section IV.B and TSCA storage areas are covered under Section IV.C.

IV.A.1 Secondary Containment Systems

Secondary containment for tanks must include one or more of the following devices:

- a. Liner external to the tank
- b. Dike
- c. Vault
- d. Double-walled tank

- e. Equivalent approved device.

IV.A.2 Integrity and Testing

Secondary containment areas must be designed, installed, and operated to ensure structural integrity. The containment system must be impervious and free of cracks, gaps, and other sources of potential penetration; thus, preventing releases to the surrounding environment.

- a. Multiple pours of concrete serve as a potential source for penetration and release of contaminants. Monolithic pours should be used whenever possible.
- b. Efforts shall be made to reduce the potential for cracking of the secondary containment structure.
 - (1) Shrinkage control additives should be used with the concrete mix, and the water content should be monitored.
 - (2) Additional steel reinforcing and expansion joints should be used to minimize the occurrence of cracking resulting from thermally induced expansion and contraction, with additional reinforcing being the preferred method.
 - (3) To minimize the effects of front penetration, the finishing of the concrete during placement should be smooth to promote drainage and prevent water from standing. Air entrainment additives also reduce the possibility of front drainage.
- c. Prohibitions on penetration of containment
 - (1) The floors and walls of each containment system shall be constructed of (or coated with) materials which are impermeable to and nonreactive with the material or waste being stored.
 - (2) Seams, joints, and other openings shall be sealed with a compatible sealant to prevent leaching of the lime in the concrete into rainwater and to prevent penetration of waste or material being stored.
- d. Requirements for testing
 - (1) New containment systems shall be leak tested with clean water in order to demonstrate hydraulic integrity before being placed in operation.
 - (2) If the containment system fails to pass the leak rate test (Equipment Testing and Inspection Procedure 30-65-MI-704, latest revision), it shall not be placed into operation, unless waived or modified by written approval.
- e. Synthetic flexible membrane liners shall be designed and installed such that they will:
 - (1) Prevent releases to the environment
 - (2) Resist punctures and tears
 - (3) Withstand failure due to heavy loading.

F. The appropriate liner shall be selected on the basis of:

- (1) Compatibility with stored wastes
- (2) Durability
- (3) Permeability
- (4) Resistance to damage during installation.

IV.A.3 Containment Area Capacity

a. Capacity requirements for outdoor storage areas shall meet the following requirements:

- (1) Dike containment volume must be able to contain ten percent of the total volume of containers or 100 percent of the volume of the largest container, whichever is greater.
- (2) Sufficient excess capacity shall be provided for precipitation and other forms of runoff based on the 24-hour, 100-year storm event for the area unless exterior walls and a roof are provided.
- (3) If a fire suppression system is in place, excess capacity shall be provided to allow for fire sprinkler systems accumulations equivalent to 20 minutes of water or 10 minutes of foam sprinkler system operation.
- (4) If no free liquids are present, secondary containment systems are not required.

b. Capacity requirements for indoor storage areas shall meet the following requirements:

- (1) Dike containment volume must be ten percent of the total volume of containers or 100 percent of the volume of the largest container, whichever is greater.
- (2) In addition to the required volume capacity, excess capacity shall be provided to allow for fire sprinkler systems accumulations. An additional volume equivalent to 20 minutes water or 10 minutes of foam sprinkler system operation must be provided.
- (3) If no free liquids are present, secondary containment systems are not required.
- (4) Secondary containment is not required if there are no floor drains in the area and there is no direct route for a spill to exit the building.

c. The minimum containment volume for temporary storage areas shall meet the following requirements:

- (1) Dike containment volume must be able to contain the largest container volume which is to be handled.
- (2) If a fire sprinkler system is required, an additional volume must be provided equivalent to 20 minutes water or 10 minutes of foam sprinkler system operation.

- (3) Sufficient excess capacity shall be provided for precipitation and other forms of runoff based on the 24-hour, 100-year storm event for the area.
- (4) If no free liquids are present, secondary containment systems are not required.
- d. The minimum containment volume may be lowered by the Environmental Management Department staff if physical or geometric constraints or risk assessments indicate that full containment is impractical. Exemptions must be approved by the manager of the Environmental Management Department as outlined in Section VI of this document.

IV.A.4 Drainage

Secondary containment systems must be sloped or otherwise designed or operated to drain and remove liquids resulting from leaks and spills. Any contained liquid must be removed from the containment system within 24 hours, or in as timely a manner as is possible to prevent harm to human health and the environment if the owner or operator can demonstrate that removal cannot be accomplished within 24 hours. Precipitation accumulation shall be managed as outlined in Y-12 Plant Procedure 70-909.

- a. The base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation.
- b. All containment systems shall have a sump located at the low point of the containment area to collect spilled or leaked waste and accumulated precipitation. These liquids must be removed from the sump as necessary to prevent overflow of the collection system.
- c. All sumps must be equipped with a submersible sump pump or an approved pump able to remove accumulated liquids from the collection system. Appropriate controls and practices must be used to prevent spills and overflows from the collection system.
 - (1) The sump pump must be operated with a manual start and manual controls.
 - (2) No steam condensate lines shall discharge directly into the collection system.
 - (3) No storm sewer drains or french drains shall be located within the secondary containment area.
 - (4) The discharge line and valving from the sump pump shall meet the following requirements:
 - (a) The recirculation line must be returned to a storage or waste tank(s) within the collection area.
 - (b) The discharge line outside the dike must have dual capability of pumping to the storm sewer or a tanker.
 - (c) The discharge line to the storm sewer shall be equipped with a key-locked valve or pump switch.

IV.A.5 Materials of Construction and Compatibility

Secondary containment structures shall consist, at a minimum, of a structurally sound base and dike walls. The floors and walls of each storage structure shall be constructed of (or coated with) materials which are free of cracks or gaps and are sufficiently impervious to contain leaks, spills, and accumulated precipitation until these liquids are detected and removed.

The following standards must be met when constructing storage facilities:

a. Permanent storage facilities

- (1) Allowable materials of construction for permanent storage areas consist of concrete and stainless steel, unless otherwise approved.
- (2) Sealants, toppings, and liners shall be required for concrete tanks, vaults, and secondary containment structures.
 - (a) Sealants shall be used along the exposed perimeter of all expansion and contraction joints. Concrete sealants may also be used to reduce the porosity of the concrete flooring.
 - (b) Floor toppings shall be required for all concrete floors to protect against traffic, exposure to chemically active vapors or liquids, thermal and mechanical stress, and other damaging physical and environmental conditions.
 - (c) Liners, or coatings, shall completely line secondary containment structures. The liners shall be able to maintain their integrity and impermeability when exposed to the stored product.
- (3) Secondary containment systems shall be constructed with chemical-resistant water stops in place at all joints.
- (4) Bituminous sealants and liners shall be prohibited from use as materials of construction. Bituminous sealants and liners may be used for containers storing water only.

b. Temporary storage facilities

- (1) Containment structures for the temporary storage shall consist of the following:
 - (a) Structurally sound base
 - (b) Synthetic, flexible-membrane liner
 - (c) Temporary berm or curb.
- (2) The liner shall provide complete containment to prevent both lateral and vertical migration of released material. Temporary berms, dikes, or curbs shall be used around an aboveground tank in conjunction with the liner to contain any released material.
- (3) Temporary storage areas shall meet the requirements of Section IV.A.2.e.

IV.A.6 Segregation of Materials

- a. The owner or operator must take precautions to prevent ignition or reaction of ignitable or reactive materials. These materials must be separated and protected from sources of ignition or reaction including but not limited to:
 - (1) Other chemicals/wastes
 - (2) Open flames
 - (3) Smoking
 - (4) Frictional heat
 - (5) Sparks
 - (6) Spontaneous ignition
 - (7) Radiant heat.
- b. The owner or operator must use a container made of or lined with materials which will not react and are otherwise compatible with the hazardous waste to be stored. The containment ability must not be impaired.
- c. Incompatible materials shall not be stored within the same containment area. A secondary containment system may be used for several storage tanks without separation walls provided the materials stored in the tanks, when mixed, will not result in a fire, explosion, release of toxic gases, or other undesirable chemical reaction.

IV.B Applicable Standards and Codes from RCRA, Subtitle C

- Design of new hazardous waste tank systems (40 CFR 264.192)
- Secondary containment requirements for tanks (40 CFR 264.193)
- Secondary containment requirements for ancillary equipment (40 CFR 264.193)
- Control systems for hazardous waste tanks (40 CFR 264.194)
- Special requirements for ignitable or reactive wastes (40 CFR 264.198 and 40 CFR 264.17)
- Special requirements for incompatible wastes (40 CFR 264.199 and 40 CFR 264.199)
- Compatibility of waste with containers (40 CFR 264.172)
- Containment (40 CFR 264.175)
- Special requirements for ignitable or reactive wastes (40 CFR 264.176)

- Special requirements for incompatible wastes (40 CFR 264.177 and 40 CFR 264.17)

This section applies only to RCRA storage areas.

IV.B.1 Secondary Containment Systems

Secondary containment systems must meet the requirements of 40 CFR 264.193 (Permitted Facilities) or 40 CFR 265.193 (Interim Status Facilities).

- a. Secondary containment must include one or more of the following devices:
 - (1) Liner external to the tank
 - (2) Dike
 - (3) Vault
 - (4) Double-walled tank
 - (5) An equivalent approved device.
- b. The system must be capable of detecting and collecting releases and accumulated liquids until the collected material is removed.

IV.B.2 Integrity and Testing

RCRA Storage areas shall meet the standards of integrity and testing as stated in Section IV.A.2.

IV.B.3 Containment Area Capacity

- a. Capacity requirements for outdoor storage areas and tank systems must meet the storage area requirements as stated in Section IV.A.3.a.

Note: Containers which store F020, F021, F022, F023, F026, and/or F027 must be provided with secondary containment even if there are no free liquids. If no free liquids are present and the containers hold materials other than those listed above, secondary containment systems are not required.

- b. Capacity requirements for indoor storage areas and tank systems must meet the storage area requirements as stated in Section IV.A.3.b.

Note: Containers which store F020, F021, F022, F023, F026, and/or F027 must be provided with secondary containment even if there are no free liquids. If no free liquids are present and the containers hold materials other than those listed above, secondary containment systems are not required.

- c. Capacity requirements for temporary storage areas and tank systems must meet the storage area requirements as stated in Section IV.A.3.c.

Note: Containers which store F020, F021, F022, F023, F026, and/or F027 must be provided with secondary containment even if there are no free liquids. If no free liquids are present and the containers hold materials other than those listed above, secondary containment systems are not required.

IV.B.4 Drainage

RCRA storage areas shall meet the drainage requirements listed in Section IV.A.4.

IV.B.5 Materials of Construction and Compatibility

RCRA storage areas shall meet the standards of construction and compatibility as stated in Section IV.A.5.

IV.B.6 Segregation of Materials

RCRA storage areas shall meet the standards for segregation of materials as stated in Section IV.A.6.

IV.C. Standards for TSCA Storage

TSCA materials stored awaiting disposal shall comply to 40 CFR 761.65.

This section applies exclusively to TSCA storage areas.

IV.C.1 Secondary Containment Systems

Secondary containment systems for TSCA storage areas must meet the requirements of 40 CFR 761.65.

TSCA storage facilities must meet the following criteria:

- a. Adequate roof and walls to prevent rain water from reaching the stored PCBs and PCB items
- b. Secondary containment system with a minimum 6-inch-high curb which meets the capacity requirements of Section IV.C.3
- c. No drain valves, floor drains, expansion joints, sewer lines, or other openings that would allow liquids to flow from the contained area
- d. Floors and curbing constructed of continuous smooth and impervious materials
- e. Not located at a site that is below the 100-year flood plain
- f. Must be capable of collecting releases and accumulated liquids until the collected material is removed.

IV.C.2 Integrity and Testing

TSCA storage areas shall meet the standards of integrity and testing as stated in IV.A.2.

IV.C.3 Containment Area Capacity

- a. Permanent TSCA storage areas shall meet the following secondary containment capacity requirements:
 - (1) Containment shall be provided for 25 percent the total volume of all PCB articles or PCB containers or 200 percent of the volume of the largest PCB article or PCB container, whichever is greater.
 - (2) In addition to the required volume capacity, excess capacity shall be provided to allow for fire sprinkler systems accumulations. An additional volume equivalent to 20 minutes water or 10 minutes of foam sprinkler system operation must be provided.
- b. Temporary TSCA storage areas shall meet the following secondary containment capacity requirements:
 - (1) Total capacity of PCBs stored must be 1,320 gallons or less, provided no single container has a capacity in excess of 660 gallons.
 - (2) Each container must bear a notation that indicates that the liquids in the drum do not exceed 500 parts per million PCBs.
 - (3) Containment shall be provided for 25 percent the total volume of containers or 200 percent of the volume of the largest container, whichever is greater.

IV.C.4 Drainage

TSCA storage areas shall meet the standards of drainage as stated in Section IV.A.4.

IV.C.5 Materials of Construction and Compatibility

TSCA storage areas shall meet the standards of construction and compatibility as stated in Section IV.A.5.

IV.C.6 Segregation of Materials

TSCA storage areas shall meet the standards for segregation of materials as stated in Section IV.A.6.

V. TRANSFER STATIONS

Transfer station facilities must be designed and operated with a secondary containment system capable of collecting releases and accumulated liquids until the collected material is removed, so as to prevent the release of any contaminants to the environment.

V.A. Secondary Containment Systems

Secondary containment systems for transfer station facilities must meet the requirements of Section IV.

1. Adequate lighting shall be provided for the transfer station areas in accordance with applicable engineering standards.
2. To eliminate the need for an additional sump pump, the transfer station may be gravity drained into an adjacent dike system, provided the requirements of capacity (see Section IV.A.3) and segregation of materials (see Section IV.A.6) are not violated.
3. The entire length of the tank trailer must be located within the secondary containment structure during transfer operations.

V.B. Integrity and Testing

Transfer station facilities shall meet the standards of integrity and testing as stated in Section IV.A.2.

V.C. Containment Area Capacity

Transfer station facilities shall meet the standards of containment area capacity as stated in Section IV.A.3.

V.D. Drainage

Transfer station facilities shall meet the standards of drainage as stated in Section IV.A.4.

V.E. Materials of Construction and Compatibility

Transfer station facilities shall meet the standards of construction and compatibility as stated in Section IV.A.5.

V.F. Segregation of Materials

Transfer station facilities shall meet the standards of materials segregation as stated in Section IV.A.6.

VI. PROCEDURES FOR OBTAINING EXEMPTIONS

A. One Time Partial Exemptions for a Specific Project

Engineering personnel or the Facility Operator shall address a letter to the manager of the Water Compliance Program Section of the Environmental Management Department indicating which clauses are requested exempt. The letter should include the reasons for the request and offer a proposed alternative if applicable. The exempt clause shall in no way jeopardize the protection of the environment or health and safety of plant personnel. It is imperative that the request be made in the early stages of design.

Upon receiving the requested exemption, Environmental Management Department personnel will review the situation and grant written approval or denial within 30 days. All exemptions must be approved by the Environmental Management Department manager or his designated representative.

B. Total Exemption for Specific Projects

Engineering personnel or the Facility Operator shall address requests to the manager of the Environmental Management Department indicating why a total exemption is required. The letter should include all reasons for the request and a proposal to minimize the potential for release of pollutants to receiving waters. The exemption shall in no way jeopardize the protection of the environment or health and safety of plant personnel.

Upon receiving the requested exemption, Environmental Management Department personnel will review the request and grant written approval or denial within 30 days.

C. Permanent Changes for All Projects

Granted or denied exemptions will be documented by the Environmental Management Department staff. The Environmental Management Department staff will keep exemption requests on file along with the approval or denial of the request. This will enable the Environmental Management Department staff to review past decisions for precedents set when dealing with new exemption requests. Periodic review of the requests for exemption will be made to determine if a document revision is needed.

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