SECONDARY CONTAINMENT AND IMPRACTICABILITY DETERMINATIONS

4.1 Introduction

The purpose of the SPCC rule is to prevent discharges of oil into navigable waters of the United States and adjoining shorelines. One of the primary ways through which the rule sets out to do this is the secondary containment requirements. A secondary containment system provides an essential line of defense in the event of a failure of an oil container (primary containment), such as a bulk storage container, a mobile or portable container, pipes or flowlines, or other oil-filled operational equipment. The system provides temporary containment of spilled oil until the appropriate response actions are taken to abate the source of the discharge and remove oil from areas where it has accumulated before the oil reaches navigable waters and adjoining shorelines. The secondary containment requirements are divided into two categories:

- **General provisions** address the potential for oil discharges from all regulated parts of a facility. Containment method, design, and capacity are determined by good engineering practice to contain an oil discharge until cleanup occurs.

- **Specific provisions** address the potential of oil discharges from specific parts of a facility where oil is stored or handled. The containment design, sizing, and freeboard requirements are specified by the SPCC rule to address a major container failure.

The *general* secondary containment requirements are intended to address the most likely oil discharge from bulk storage containers; mobile/portable containers; production tank battery, treatment, and separation installations; a particular piece of oil-filled operational or process equipment; (non-rack) transfer activity; or piping in accordance with good engineering practice. The *specific* secondary containment requirements are intended to address a major container failure (the entire contents of the container and/or compartment) associated with a bulk storage container; single compartment of a tank car or tank truck at a loading/unloading rack; mobile/portable containers; and production tank batteries, treatment, and separation installations. These specific provisions (see Table 4.1 in Section 4.2) explicitly provide requirements for sizing, design, and freeboard that need to be addressed in the SPCC Plan.

The purpose of this chapter is to clarify the relationships among the various general and specific secondary containment requirements of the SPCC rule, and to demonstrate how these requirements apply. This chapter also discusses the rule's impracticability determination provision, which may be used when a facility owner/operator is incapable of installing secondary containment by any reasonable method. The additional requirements that accompany an impracticability determination, the documentation needed to support such a determination, and the role of the EPA inspector in reviewing secondary containment requirements and impracticability determinations are also discussed.

The remainder of this chapter is organized as follows:

- **Section 4.2** provides an overview of the SPCC rule's secondary containment provisions, both general and specific. It also discusses related issues, such as active versus passive measures, the "sufficiently impervious" requirement, and facility drainage. The role of the EPA inspector in evaluating compliance with the rule provisions is discussed for each of these subjects.
- **Section 4.3** describes the impracticability determination provision.
- **Section 4.4** discusses how the impracticability determination may be used in certain circumstances.
- **Section 4.5** describes required measures when secondary containment is impracticable.
- **Section 4.6** describes the role of the EPA inspector in reviewing impracticability determinations.

4.2 Overview of Secondary Containment Provisions

The SPCC rule includes several different secondary containment provisions intended to address the various activities or locations at a facility in which oil is handled. This section differentiates among the general and specific secondary containment provisions.

Table 4-1 lists all the secondary containment provisions of the SPCC rule for different types of facilities.

Table 4-1. Secondary containment provisions in 40 CFR part 112.

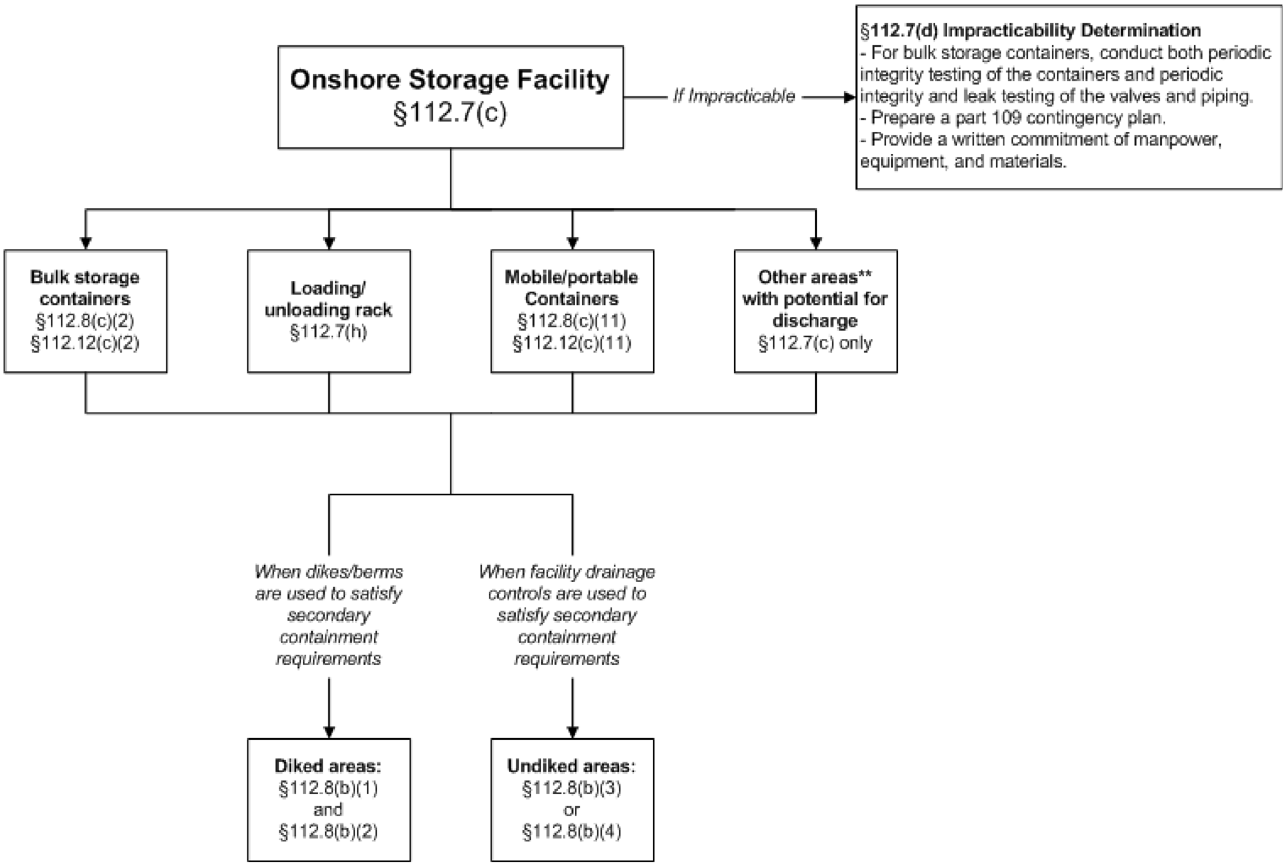
Type of Facility	Secondary Containment	Rule Section(s)
All Facilities	General containment (areas with potential for discharge, e.g., piping, oil-filled operating and manufacturing equipment, and non-rack related transfer areas)	112.7(c)
	Loading/unloading racks*,**	112.7(h)(1)
Onshore Storage	Bulk storage containers*	112.8(c)(2) or 112.12(c)(2)
	Mobile or portable oil containers*	112.8(c)(11) or 112.12(c)(11)
Onshore Production	Bulk storage containers, including tank batteries, separation, and treating facility installations*	112.9(c)(2)
Onshore Oil Drilling and Workover	Mobile drilling or workover equipment	112.10(c)
Offshore Oil Drilling, Production, and Workover	Oil drilling, production, or workover equipment	112.7(c)

* Sized secondary containment requirement, as discussed in Section 4.2.2.

** Although this requirement applies to all facilities, loading and unloading rack equipment is often not present at typical production facilities, as discussed in Section 4.4.2.

Figures 4-1 through 4-4 illustrate the relationships between the secondary containment requirements at various types of facilities. EPA inspectors should use the flowchart that corresponds to the type of facility he or she is visiting (see the uppermost box in each flowchart). Types of containers, equipment, and activities or areas where oil is handled are identified in the second row of the flowchart, with reference to the appropriate secondary containment rule provision. The flowcharts note the use of impracticability determinations and additional design considerations for other areas with the potential for discharge.

Figure 4-1. Secondary containment provisions in 40 CFR part 112 related to onshore storage facilities (§§112.7 and 112.8 or 112.12).



*** Examples of areas with potential for discharge may include: piping and flowlines, oil-filled electrical or operating equipment, and loading/unloading areas*

Figure 4-2. Secondary containment provisions in 40 CFR part 112 related to onshore production facilities (§§112.7 and 112.9).

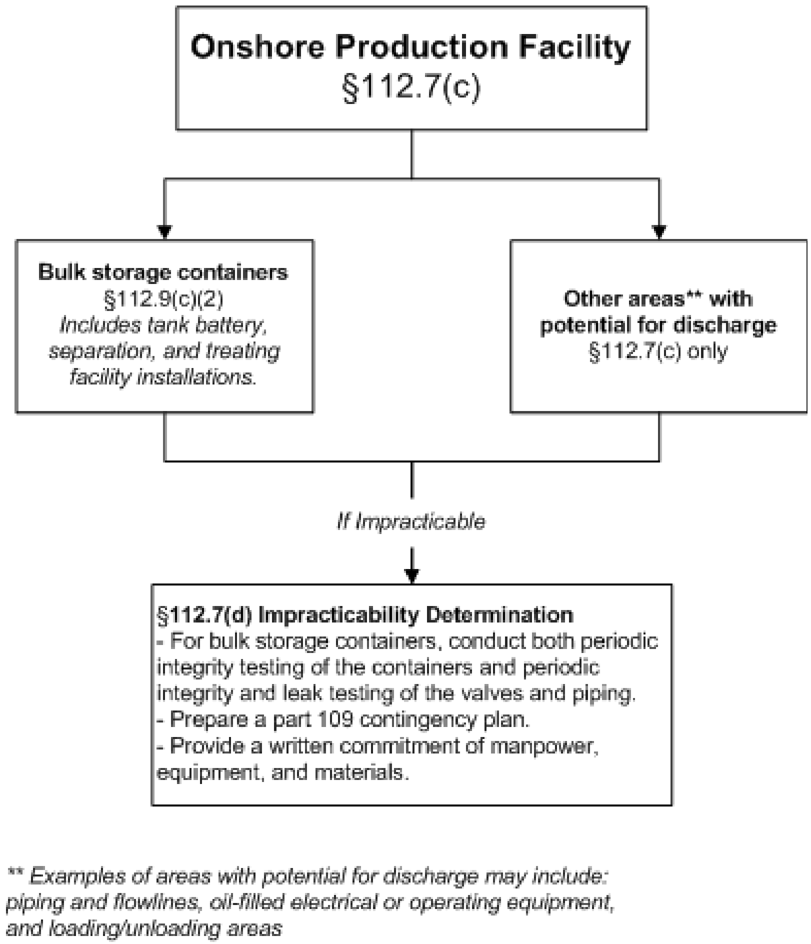
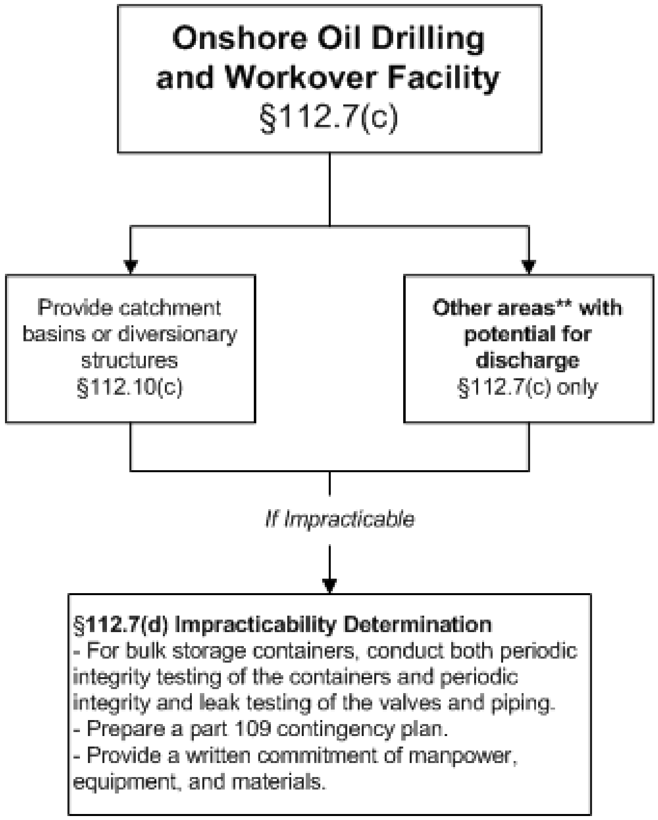
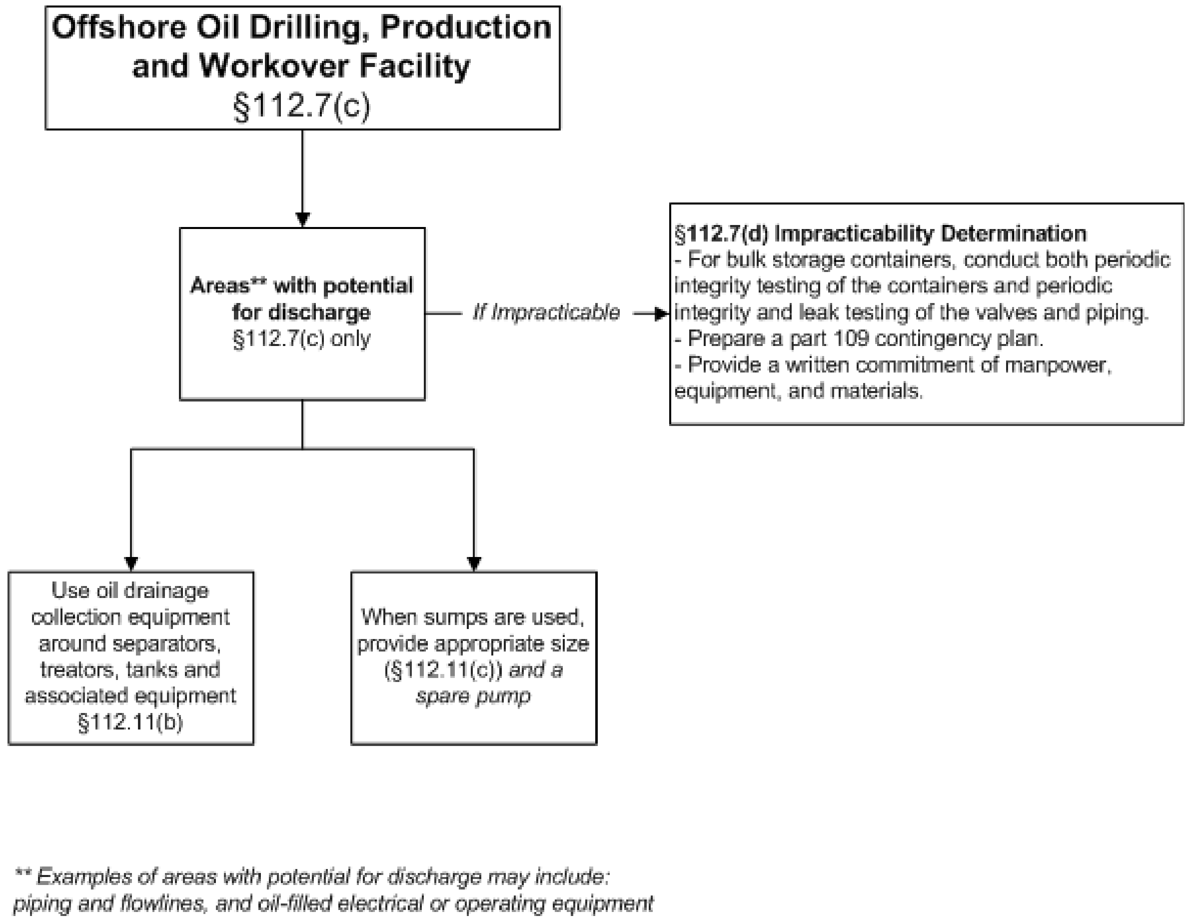


Figure 4-3. Secondary containment provisions in 40 CFR part 112 related to onshore oil drilling and workover facilities (§§112.7 and 112.10).



*** Examples of areas with potential for discharge may include: piping and flowlines, oil-filled electrical or operating equipment, and loading/unloading areas*

Figure 4-4. Secondary containment provisions in 40 CFR part 112 related to offshore oil drilling, production, and workover facilities (§§112.7 and 112.11).



4.2.1 General Secondary Containment Requirement

> **§112.7(c)**
> Provide appropriate containment and/or diversionary structures or equipment to prevent a discharge as described in §112.1(b). The entire containment system, including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs. At a minimum, you must use one of the following prevention systems or its equivalent:
> (1) For onshore facilities:
> (i) Dikes, berms, or retaining walls sufficiently impervious to contain oil;
> (ii) Curbing;
> (iii) Culverting, gutters, or other drainage systems;
> (iv) Weirs, booms, or other barriers;
> (v) Spill diversion ponds;
> (vi) Retention ponds; or
> (vii) Sorbent materials.
> (2) For offshore facilities:
> (i) Curbing or drip pans; or
> (ii) Sumps and collection systems.
>
> Note: The above text is an excerpt of the SPCC rule. Refer to 40 CFR part 112 for the full text of the rule.

At a regulated facility, all areas with the potential for a discharge are subject to the general secondary containment provision, §112.7(c). These areas may have bulk storage containers; mobile/portable containers; production tank batteries, treatment, and separation installations; pieces of oil-filled operational or manufacturing equipment; loading/unloading areas (also referred to as transfer areas); piping; and may include other areas of a facility where oil is present. The general secondary containment provision requires that these areas be designed with appropriate containment and/or diversionary structures to prevent a discharge that may be harmful (a discharge as described in §112.1(b)). "Appropriate containment" should be designed to address the most likely discharge from the primary containment system such that the discharge will not escape containment before cleanup occurs.

Section 112.7(c) lists several methods of providing secondary containment, which are described in Table 4-2. These methods are examples only; other containment methods may be used, consistent with good engineering practice. For example, a facility could use an oil/water separator, combined with a drainage system, to collect and retain discharges of oil within the facility. Certification of the SPCC Plan verifies that whatever secondary containment methods are selected are appropriate for the facility and that they follow good engineering practice.

> **Discharge as described in §112.1(b)** is a discharge "in quantities that may be harmful, as described in part 110 of this chapter [40 CFR part 110], into or upon the navigable waters of the United States or adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson Fishery Conservation and Management Act)..."
>
> Note: The above text is an excerpt of the SPCC rule. Refer to 40 CFR part 112 for the full text of the rule.

Table 4-2. Example methods of secondary containment listed in §112.7(c).

Secondary Containment Method	Description of Examples
Dikes, berms, or retaining walls sufficiently impervious to contain oil	Types of permanent engineered barriers, such as raised earth embankments or concrete containment walls, designed to hold oil. Normally used in areas with potential for large discharges, such as single or multiple aboveground storage tanks and certain piping. Temporary dikes and berms may be constructed after a discharge is discovered as an active containment measure (or a countermeasure) so long as they can be implemented in time to prevent the spilled oil from reaching surface waters. Please see Section 4.2.6, Passive Versus Active Measures of Secondary Containment.
Curbing	Typically consists of a permanent reinforced concrete or an asphalt apron surrounded by a concrete curb. Can also be of a uniform, rectangular cross-section or combined with mountable curb sections to allow access to loading/unloading vehicles and materials handling equipment. Can be used where only small spills are expected and also used to direct spills to drains or catchment areas. Temporary curbing may be constructed after a discharge is discovered as an active containment measure (or a countermeasure) so long as it can be implemented in time to prevent the spilled oil from reaching surface waters. Please see Section 4.2.6, Passive Versus Active Measures of Secondary Containment.
Culverting, gutters, or other drainage systems	Types of permanent drainage systems designed to direct spills to remote containment or treatment areas. Ideal for situations where spill containment structures cannot or should not be located immediately adjacent to the potential spill source.
Weirs	Dam-like structures with a notch through which oil may flow to be collected. Generally used in combination with skimmers to remove oil from the surface of water.
Booms	Form a continuous barrier placed as a precautionary measure to contain/collect oil. Typically used for the containment, exclusion, or deflection of oil floating on water, and is usually associated with an oil spill contingency or facility response plan to address oil spills that have reached surface waters. Beach booms are designed to work in shallow or tidal areas. Sorbent-filled booms can be used for land-based spills. There are very limited applications for use of booms for land-based containment of discharged oil.
Barriers	Spill mats, storm drain covers, and dams used to block or prevent the flow of oil. Temporary barriers may be put in place prior to a discharge or after a discharge is discovered. These are both considered effective active containment measures (or countermeasures) as long as they can be implemented in time to prevent the spilled oil from reaching navigable waters and adjoining shorelines. Please see Section 4.2.6, Passive Versus Active Measures of Secondary Containment.

Secondary Containment Method	Description of Examples
Spill diversion ponds and retention ponds	Designed for long-term or permanent containment of storm water capable to capture and hold oil or runoff and prevent it from entering surface water bodies. Temporary spill diversion ponds and retention ponds may be constructed after a discharge is discovered as an active containment measure (or countermeasure) as long as they can be implemented in time to prevent the spilled oil from reaching navigable waters and adjoining shorelines. There are very limited applications for use of temporary spill diversion and retention ponds for land-based containment of discharged oil due to the timely availability of the appropriate excavation equipment required to rapidly construct the ponds. Please see Section 4.2.6, Passive Versus Active Measures of Secondary Containment.
Sorbent materials	Insoluble materials or mixtures of materials (packaged in forms such as spill pads, pillows, socks, and mats) used to recover liquids through the mechanisms of absorption, adsorption, or both. Materials include clay, vermiculite, diatomaceous earth, and man-made materials. Used to isolate and contain small drips or leaks until the source of the leak is repaired. Commonly used with material handling equipment, such as valves and pumps. Also used as an active containment measure (or countermeasure) to contain and collect small-volume discharges before they reach waterways. Please see Section 4.2.6, Passive Versus Active Measures of Secondary Containment.
Drip pans	Used to isolate and contain small drips or leaks until the source of the leak is repaired. Drip pans are commonly used with product dispensing containers (usually drums), uncoupling of hoses during bulk transfer operations, and for pumps, valves, and fittings.
Sumps and collection systems	A permanent pit or reservoir and the troughs/trenches connected to it that collect oil.

4.2.2 Specific Secondary Containment Requirements

While all parts of a regulated facility with potential for a discharge are, at a minimum, subject to the general secondary containment requirements of §112.7(c), areas where certain types of containers, activities, or equipment are located may be subject to additional, more stringent containment requirements, including specifications for minimum capacity (see Table 4-1.) The SPCC rule specifies a required minimum size for secondary containment for the following areas:

- Bulk storage containers;
- Loading/unloading racks;
- Mobile or portable bulk storage containers; and
- Production facility bulk storage containers, including tank batteries, separation, and treating vessels/equipment.

The applicable requirements for each of these types of containers or equipment are discussed in more detail in Section 4.4 of this chapter. In general, provisions for sized secondary containment require that the chosen containment method be sized to contain the largest single oil compartment or container plus "sufficient freeboard" to contain precipitation, as discussed in Section 4.2.4 below. Specific freeboard sizing requirements apply to all of the areas listed above except loading/unloading racks.

EPA inspectors should note that the "largest single compartment" may consist of containers that are permanently manifolded together. Permanently manifolded tanks are tanks that are designed, installed, or operated in such a manner that the multiple containers function as a single storage unit (67 FR 47122). Accordingly, the total capacity of manifolded containers is the design capacity standard for the sized secondary containment provisions (plus freeboard in certain cases).

4.2.3 Role of the EPA Inspector in Evaluating Secondary Containment Methods

The EPA inspector should evaluate whether the secondary containment system is adequate for the facility, and whether it is maintained to contain any oil discharges to navigable waters and adjoining shorelines. Some items that the inspector should look for include:

For a dike, berm, or other engineered secondary containment system:

- Capacity of the system to contain oil as determined by the Professional Engineer (PE) in accordance with good engineering practice and the requirements of the rule;
- Cracks in containment system materials (e.g., concrete, liners, coatings, earthen materials);
- Discoloration;
- Presence of spilled or leaked material (standing liquid);
- Corrosion of the system;
- Erosion of the system;
- Level of precipitation in diked area and available capacity versus design capacity;
- Dike or berm permeability;
- Presence of debris;
- Operational status of drain valves or other drainage controls;
- Location/status of pipes, inlets, and drainage around and beneath containers;
- Excessive vegetation that may inhibit visual inspection and assessment of berm integrity;
- Large-rooted plant systems (e.g., shrubs, cacti, trees) that could affect the berm integrity;
- Holes or penetrations to the containment system created by burrowing animals; and
- Drainage records for rainwater discharges from containment areas.

For retention and drainage ponds:

- Capacity of the system to contain oil as determined by the PE in accordance with good engineering practice and the requirements of the rule;
- Erosion of the system;
- Cracks in containment system materials (e.g., concrete, liners, coatings, earthen materials);
- Discoloration;
- Design capacity versus available capacity;
- Presence of spilled or leaked liquid;
- Presence of debris;
- Stressed vegetation;
- Evidence of water seeps from the system; and
- Operational status of drain valves or other drainage controls.

Some of the items listed above are discussed in more detail in later sections of this guidance document.

4.2.4 Sufficient Freeboard

The SPCC rule does not specifically define the term “sufficient freeboard,” nor does it describe how to calculate this volume. The 1991 proposed amendment to the SPCC rule recommended the use of industry standards and data on 25-year storm events to determine the appropriate freeboard capacity. Numerous commenters on the 1991 proposal questioned the 25-year storm event recommendation and suggested alternatives, such as using 110 percent of storage tank capacity or using other characteristic storm events. EPA addressed these comments in the preamble to the 2002 rule:

> We believe that the proper standard of “sufficient freeboard” to contain precipitation is that amount necessary to contain precipitation from a 25-year, 24-hour storm event. That standard allows flexibility for varying climatic conditions. It is also the standard required for certain tank systems storing or treating hazardous waste. (67 FR 47117)

However, EPA did not set this standard as a requirement for freeboard capacity. Therefore, the use of precipitation data from a 25-year, 24-hour storm event is not enforceable as a standard for containment freeboard. In the preamble, EPA stated:

> While we believe that the 25-year, 24-hour storm event standard is appropriate for most facilities and protective of the environment, we are not making it a rule standard because of the difficulty and expense for some facilities of securing recent information concerning such storm events at this time.

Ultimately EPA determined that, for freeboard, “the proper method of secondary containment is a matter of engineering practice so [EPA does] not prescribe here any particular method” (67 FR 47101). However, where data are available, the facility owner/operator (and certifying PE) should consider the appropriateness of the 25-year, 24-hour storm event precipitation level as a matter of good engineering practice.

EPA recognizes that a "110 percent of storage tank capacity" rule of thumb may be a potentially acceptable design criterion in many situations, and that aboveground storage tank regulations in many states require that secondary containment be sized to contain at least 110 percent of the volume of the largest tank. However, in some areas, 110 percent of storage tank capacity may not provide enough volume to contain precipitation from storm events. Some states require that facilities consider storm events when designing secondary containment structures, and in certain cases these requirements translate to more stringent sizing criteria than the 110 percent rule of thumb. Other important factors may be considered in determining necessary secondary containment capacity. According to practices recommended by industry groups such as the American Petroleum Institute (API), these factors include:

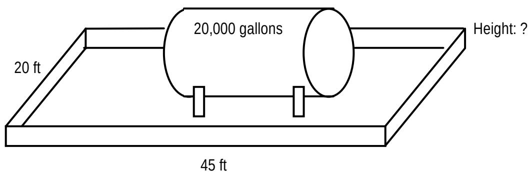
- Local precipitation conditions (rainfall and/or snowfall);
- Height of the existing dike wall;
- Size of tank/container;
- Safety considerations; and
- Frequency of dike drainage and inspection.

The following examples (Figure 4-5 and Figure 4-6) present secondary containment size calculations for hypothetical oil storage areas. The certifying PE determines what is sufficient freeboard for precipitation for secondary containment and should document how the determination was made along with supporting calculations in the SPCC Plan.

Figure 4-5. Sample calculation of containment size, using two design criteria.

The following example compares two different design criteria: one based on the volume of the tank and one based on precipitation.

Scenario:
A 20,000-gallon horizontal tank is placed within an engineered secondary containment structure, such as a concrete dike. The tank is 35 feet long by 10 feet in diameter. The secondary containment area provides a 5-foot buffer on all sides (i.e., dike dimensions are 45 feet x 20 feet).



Given the dike footprint, we want to determine the wall height necessary to provide sufficient freeboard for precipitation, based on (1) the tank storage capacity; (2) actual precipitation data. Several storm events in the recent past caused precipitation in amounts between 3.6 and 4.0 inches at this location, although greater amounts have also been reported in the past.
Note: The factor for converting cubic feet to gallons is 7.48 gallons/ft^3.

1. Calculation of secondary containment capacity, based on a design criterion of 110% of tank storage capacity:

Containment surface area = 45 ft x 20 ft = 900 ft^2
Tank volume, based on 100% of tank capacity = 20,000 gallons
Tank volume, in cubic feet = 20,000 gallons / 7.48 gallons/ft^3 = 2,674 ft^3
Wall height that would contain the tank's volume = 2,674 ft^3 / 900 ft^2 = 2.97 ft

Containment capacity with freeboard, based on 110% of tank capacity = 22,000 gallons
Containment capacity, in cubic feet = 22,000 gallons / 7.48 gallons/ft^3 = 2,941 ft^3
Wall height equivalent to 110% of storage capacity = 2,941 ft^3 / 900 ft^2 = 3.27 feet
Height of freeboard = 3.27 ft - 2.97 ft = 0.3 ft = 3.6 inches

Therefore, a dike design based on a criterion of 110% of tank capacity provides a dike wall height of 3.27 feet.

2. Calculation of secondary containment capacity, based on rainfall criterion:

After a review of historical precipitation data for the vicinity of the facility, the PE determined that a 4.5 inch rain event is the most reasonable design criterion for this diked area.

Containment surface area = 45 ft x 20 ft = 900 ft^2
Tank volume, based on 100% of tank capacity = 20,000 gallons
Tank volume, in cubic feet = 20,000 gallons / 7.48 gallons/ft^3 = 2,674 ft^3
Wall height that would contain the tank's volume = 2,674 ft^3 / 900 ft^2 = 2.97 ft

The height of the dike would need to be 3.35 feet (2.97 ft + 4.5 in).

4.5 inches / 12 inches = .375 ft + 2.97 ft = 3.35 ft

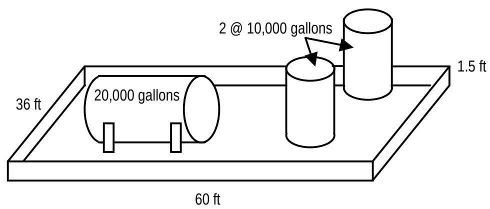
Therefore, a dike design based on a 4.5 inch rain event provides a dike wall height of 3.35, or 0.9 inch higher than calculated using the 110% criterion.

Conclusion: As noted from the comparison of the two design criteria illustrated above, the dike heights are similar. The adequacy of the secondary containment freeboard is ultimately an engineering determination made by the PE and certified in the Plan.

Figure 4-6. Sample secondary containment calculations, for multiple tanks in a containment area.

The EPA inspector has questioned the adequacy of the secondary containment based on the following scenario and wants to verify how much precipitation the dike area can hold and compare it to available precipitation data to determine if 112% is an adequate design criterion for this facility.

Scenario:
A 60 ft x 36 ft concrete dike surrounds one 20,000-gallon horizontal tank (10 ft diameter and 35 ft length) and two 10,000-gallon vertical tanks (each 10 ft diameter and 15 ft height). The dike walls are 18 inches (1.5 feet) tall. The SPCC Plan states that secondary containment is designed to hold 112% of the volume of the largest container.



Notes:
– The factor for converting gallons to cubic feet is 7.48 gallons/ft^3.
– The volume displaced by a cylindrical vertical tank is the tank volume within the containment structure and is equal to the tank footprint multiplied by height of the concrete dike. The tank footprint is equal to $\pi D^2/4$, where D is the tank diameter.

1. Calculate total dike capacity:

Total capacity of the concrete dike
= length x width x height = 60 ft x 36 ft x 1.5 ft = 3,240 ft^3 = 24,235 gallons

2. Calculate net dike capacity, considering displacement from other tanks within the dike:

The total capacity of the concrete dike is reduced by the volume "displaced" by other tanks inside the containment structure. The displacement is:
= number of tanks x footprint x height of dike wall
= 2 x π(10 ft)^2 /4 x 1.5 ft = 235.6 ft^3 = 1,762 gallons

The net dike capacity, i.e., the volume that would be available in the event of a failure of the largest tank within the dike, is:
= Total volume – tank displacement = 24,235 – 1,762 = 22,473 gallons = 3,004 ft^3

3. Calculate the amount of available freeboard provided by the dike, given the net dike capacity:

The available freeboard volume is:
= Net dike capacity – volume of largest tank within the dike
= 22,473 – 20,000 = 2,473 gallons = 331 ft^3

This is equivalent, expressed in terms of the capacity of the largest tank, to:
= Net dike capacity/volume of largest tank within the dike
= 22,473 / 20,000 = 112%

This available freeboard volume provides a freeboard height:
= Available freeboard volume / dike surface area
= 331 ft^3 / (60 ft x 36 ft) = 0.15 ft $\approx$1.8 in

Therefore, this dike provides sufficient freeboard for 1.8 inches of precipitation.

Conclusion:
The EPA inspector should review the Plan and/or inquire about the precipitation event considered in determining that "sufficient freeboard for precipitation" is provided. The adequacy of the secondary containment freeboard is ultimately an engineering determination made by the PE and is certified in the Plan. This example serves only as a guide on doing the calculations for certain circumstances in which the inspector has concerns with the freeboard volume associated with the secondary containment design.

4.2.5 Role of the EPA Inspector in Evaluating Sufficient Freeboard

When reviewing an SPCC Plan, the EPA inspector should evaluate whether the size of secondary containment is adequate to meet the freeboard requirement. When examining the secondary containment measures for bulk storage containers, mobile or portable oil containers, and production facility bulk storage containers, the inspector should ensure that the Plan documents that the secondary containment capacity can hold the entire capacity of the largest single container, plus sufficient freeboard to contain precipitation. Whatever method is used to calculate the amount of freeboard that is "sufficient" for the facility and container configuration should be documented in the Plan.

To determine whether secondary containment is sufficient, the EPA inspector may:

- Verify that the Plan specifies the capacity of secondary containment along with supporting documentation, such as calculations for comparing freeboard capacity to the volume of precipitation in an expected storm event.
  - If calculations are not included with the Plan, and the inspector suspects the secondary containment is inadequate, the inspector may request supporting documentation from the owner/operator.[1]
  - If diked area calculations appear inadequate, review local precipitation data such as data from airports or the National Weather Service,[2] as needed.
- Review operating procedures, storage tank design, and/or system controls for preventing inadvertent overfilling of oil storage tanks that could affect the available capacity of the secondary containment structure.
- Confirm that the secondary containment capacity can reasonably handle the contents of the largest tank on an *ongoing basis* (i.e., including during rain events).
- During the inspection, verify that the containment structures and equipment are maintained and that the SPCC Plan is properly implemented.

4.2.6 Passive Versus Active Measures of Secondary Containment

In some situations, permanent containment structures, such as dikes, may not be feasible (i.e., for certain electrical equipment). Section 112.7(c) allows for the use of certain types of active containment measures (countermeasures or spill response capability), which *prevent a discharge to navigable waters or adjoining shorelines.* Active containment measures are those that require deployment or other specific action by the owner or operator. These measures may be deployed either before an activity involving the handling of oil starts, or in reaction to a discharge so long as the active measure is designed to prevent an oil spill from reaching *navigable water or adjoining*

[1] Industry guidance recommends that facility owners/operators include any secondary containment capacity calculations and/or design standards with the Plan. API Bulletin D16, "Suggested Procedure for Development of Spill Prevention Control and Countermeasure Plans," contains example calculations to which inspectors may refer.

[2] National Weather Service, Hydrometeorological Design Studies Center, Current Precipitation Frequency Publications, available at http://www.nws.noaa.gov/oh/hdsc/currentpf.htm#N2.

shorelines. Passive measures are permanent installations and do not require deployment or action by the owner/operator.

Active measures (countermeasures) include, but are not limited to:

- **Placing a properly designed storm drain cover over a drain to contain a potential spill in an area where a transfer occurs, *prior* to the transfer activity.** Storm drains are normally kept uncovered; deployment of the drain cover prior to the transfer activity may be an acceptable active measure to prevent a discharge from reaching navigable waters or adjoining shorelines through the drainage system.

- **Placing a storm drain cover over a drain in reaction to a discharge, before the oil reaches the drain.** If deployment of a drain cover can *reliably* be achieved in time to prevent a discharge of oil from reaching navigable waters or adjoining shorelines, this may be an acceptable active measure. This method may be risky, however, and is subject to a good engineering judgement on what is realistically and reliably achievable, even under adverse circumstances.

- **Using spill kits in the event of an oil discharge.** The use of spill kits, strategically located and ready for deployment in the event of an oil discharge, may be an acceptable active measure, in certain circumstances, to prevent a spill from reaching navigable waters or adjoining shorelines. This method may be risky and is subject to good engineering judgement, considering the volume most likely expected to be discharged and proximity to navigable waters or adjoining shorelines.

> ☞ **Tip**
>
> *Active* – The containment measure involves a certain action by facility personnel before or after the discharge occurs. These actions are also referred to as spill countermeasures.
>
> *Passive* – The containment measure remains in place regardless of the facility operations and therefore does not require facility personnel to act.

- **Use of spill response capability (spill response teams) in the event of an oil discharge.** This method differs from activating an oil spill contingency plan (such as required in §112.7(d)) because the response actions are specifically designed to contain an oil discharge *prior to reaching navigable waters or adjoining shorelines.* This may include the emergency construction/deployment of dikes, curbing, diversionary structures, ponds, and other temporary containment methods (such as sorbent materials) so long as they can be implemented in time to prevent the spilled oil from reaching navigable waters or adjoining shorelines. This method may be risky and is subject to good engineering judgement.

- **Closing a gate valve that controls drainage from an area prior to a discharge.** If the gate valve is normally kept open, closing it before an activity that may result in an oil discharge may be an acceptable active measure to prevent a spill from reaching navigable waters or adjoining shorelines.

The efficacy of active containment measures to prevent a discharge depends on their technical effectiveness (e.g., mode of operation, absorption rate), placement and quantity, and timely deployment prior to or following a discharge. For discharges that occur only during manned activities, such as those occurring during transfers, an active measure (e.g, sock, mat, other portable barrier, or land-based response capability) may be appropriate, provided that the measure is capable of containing the oil discharge volume and rate, and is timely and properly constructed/deployed. Ideally, in order to further reduce the potential for a discharge to reach navigable waters or adjoining shorelines, the active measure should be deployed prior to initiating the activity with potential for a discharge.

> ☞ **Tip**
> *Land-Based Response Capability* is used to describe any active measure that is deployed/ implemented immediately upon discovery of a discharge before the discharge reaches navigable waters or adjoining shorelines.
>
> *Contingency Plan* is used to describe measures for controlling, containing, and recovering oil that has been discharged into or upon navigable waters or adjoining shorelines in such quantities as may be harmful.

For certain active measures, however, such as the use of “kitty litter” or other loose sorbent material, it may be impractical to pre-deploy the measure. In such cases, the sorbent material should be readily available so that it can *immediately* be used before the spill can spread. Portable tanks can be equipped with a spill kit to be used in the event of a discharge during transfers. The spill kit should be sized, however, to effectively contain the volume of oil that could be discharged. Most commercially available spill kits are intended for relatively small volumes (up to approximately 150 gallons of oil). EPA generally believes that active containment measures can be used to satisfy the general secondary containment requirement when they are capable of containing the most likely discharge volume. Elements to consider may include the capacity of the containment measure, effectiveness, and timely implementation, and the availability of personnel and equipment to implement the active measure effectively at the facility. For example, a most likely discharge of 600 gallons would require deploying more than 900 “high-capacity” sorbent pads (20 inches by 20 inches) since each pad absorbs less than 0.7 gallons of oil. The same spill volume would require nine sorbent blankets, each measuring 38 inches by 144 feet and weighing approximately 40 pounds. The rapid deployment of such response equipment and material would be difficult to achieve under most circumstances, particularly if only a few individuals are present when the discharge occurs, or during adverse conditions (e.g., rainfall, fire).

The secondary containment approach implemented at a facility need not be “one size fits all.” Different approaches may be taken for the same activity at a given facility, depending on the material and location. For example, the SPCC Plan may specify that drain covers and sorbent material be pre-deployed prior to transfers of low viscosity oils in certain areas of a facility located in close proximity to navigable waters or drainage structures. For other areas and/or other products (e.g., highly viscous oils), the Plan may specify that sufficient spill response capability (spill response teams) are available for use in the event of a discharge, so long as personnel and equipment are available at the facility and these measures can be effectively implemented in a timely manner to prevent oil from reaching navigable waters and adjoining shorelines.

Additionally, oil-filled operational equipment (e.g., electrical transformers, capacitors, switches) poses unique challenges, and permanent (passive) containment structures, such as dikes, may not always be feasible. This type of oil-filled operational equipment is only subject to the general secondary containment provision, and the owner/operator may use the flexibility of active containment measures as described above. However, this method of containment may be risky because it requires the ability to detect a discharge, and these measures must be implemented *effectively and in a timely manner to prevent oil from reaching navigable waters and adjoining shorelines,* as required by §112.7(a)(3)(iii) and (c). The owner/operator may determine that these methods prove impracticable for a facility with oil-filled operational equipment (e.g., because of timeliness of a response). When secondary containment is impracticable, the certified SPCC Plan must document the reasons for impracticability; use a contingency plan in lieu of secondary containment; and provide a written commitment of manpower, equipment, and materials to expeditiously control and remove any quantity of oil discharged that may be harmful (§112.7(d)).

In certain circumstances, sorbents, such as socks, booms, pads, or loose materials, may be used to complement passive measures. Where berms around transfer areas are open on one side for access, and where the ground surface slopes away from the opening and from drains, for example, sorbent material may be effective in preventing small quantities of oil from escaping the bermed area in the event of a discharge.

Active measures are not appropriate for all situations with the potential for an oil discharge. As noted above, active measures often have limited absorption or containment capacity. Additionally, storage tanks, piping, and other containers pose a risk of discharge during off-hour periods when facility personnel are generally not on-site or are too few in number to detect a discharge in a timely manner and deploy the containment measure(s). Pre-deployment of active measures in a “fixed” configuration may be problematic since sorbent materials or portable barriers are typically not engineered for long-term deployment, and their performance may be affected by precipitation, ultraviolet light degradation, or cold temperature. Moreover, in some cases, the deployment of an active measure can interfere with other systems; for example, by impeding the proper operation of drainage structures (e.g., drain cover). For these reasons, EPA generally believes that dikes/berms, curbing, spill diversion ponds, or other similarly fixed, engineered structures remain the most effective means of spill control and containment for oil storage containers.

The SPCC Plan must describe the procedures used to deploy the active measures, explain how the use of active measures is appropriate to the situation, and explain the methods for discharge discovery that will be used to determine when deployment of the active measures is appropriate (§112.7(a)(3)(iii) and (iv)). It should, for instance, discuss whether active measures will be put in place before a potential discharge event (e.g., a boom placed around a vehicle before fueling activities begin) or whether the active measures will be deployed quickly after a spill occurs as a countermeasure (e.g., sorbents on hand to contain a spill should one occur). EPA also recommends that the Plan describe the amount of materials available and the location where they are stored, and the manpower required to adequately deploy the material in a timely fashion. Both the amount and location of materials should be determined based on good engineering practice, taking into consideration the potential volume of a discharge and the time necessary to deploy the measure to prevent a discharge to navigable waters or adjoining shorelines. Some of this information may already be described in other existing documents at the facility (i.e., BMPs) in which case, these documents should be referenced in the SPCC Plan and available at the time of an inspection.

There is a subtle but important difference between active containment measures (countermeasures, including land-based response capability) and an oil spill contingency plan as described in §112.7(d). Active secondary containment (as opposed to permanent or passive containment structures) requires a deployment action; it is put in place prior to or immediately upon discovery of an oil discharge. The purpose of these measures is *to contain an oil discharge before it reaches navigable waters or adjoining shorelines;* alternatively, a contingency plan, for SPCC purposes, is a detailed oil spill response plan developed when any form of secondary containment is determined to be impracticable. A contingency plan addresses controlling, containing, and recovering an oil discharge in quantities that may be harmful to navigable waters or adjoining shorelines. The purpose of a contingency plan should be both to outline response capability or countermeasures to limit the quantity of a discharge reaching navigable waters or adjoining shorelines (if possible), and to address *response to a discharge of oil that has reached navigable waters or adjoining shorelines.*

Evaluating the ability of active secondary containment measures deployed after a discharge to prevent oil from reaching navigable waters and adjoining shorelines involves considering the time it would take to discover the discharge, the time for the discharge to reach navigable waters or adjoining shorelines, and the time necessary to deploy the active secondary containment measure. For some active containment measures such as the use of sorbent materials, the amount of oil the secondary containment measure can effectively contain, including the potential impact of precipitation on sorption capacity, is a critical factor. EPA would expect good engineering practice to indicate that active secondary containment measures may be used to satisfy the general secondary containment requirements of §112.7(c). Generally, active containment measures may not be appropriate for satisfying the specific containment requirements for a major container failure. Furthermore, even when used to comply with §112.7(c), EPA recommends that active measures be limited to those situations where the PE has determined that the mostly likely discharge is a small volume.

4.2.7 Role of the EPA Inspector in Evaluating the Use of Active Measures of Secondary Containment

Inspectors should carefully evaluate the use of active measures and determine if the equipment and personnel are available for deployment of this secondary containment method. The EPA inspector should inspect the facility to determine whether the active measures are appropriate for the facility – i.e., the inspector should note whether material storage locations are reasonable given the time necessary to deploy measures, and whether the amount of available materials is sufficient to handle the anticipated discharge volume. In addition, the inspector should document whether the facility is keeping the necessary records.

Upon inspection, a facility owner/operator should be able to demonstrate that facility personnel are able to carry out the deployment procedure as written. The EPA inspector should verify that the facility's SPCC Plan contains the following items, and that items in the Plan are observed in the field and/or verified through discussions with facility personnel. Questions for the EPA inspector to consider in determining the adequacy of active measures are also provided below.

- Explanation showing why the use of active measures is appropriate.
  - What is the PE-determined expected/most likely potential discharge volume, and is the active measure appropriately sized to contain the spill?
  - What is the discharge detection method and is it appropriate?
  - How much time is required to deploy the selected active measure?
  - Given these factors, is the active measure a reasonable approach?

- Detailed description of deployment procedures.
  - Will active measures be put in place before a potential discharge event or after a spill occurs?
  - If measures are to be activated after a spill occurs, does the Plan describe the method of discharge detection?
  - Are the equipment and personnel available to deploy/implement the proposed active containment measure in an effective/timely manner to prevent oil from reaching navigable waters or adjoining shorelines?
  - Does the Plan identify drainage pathways and the appropriate deployment location for the active measures?

- Description of all necessary materials and the location where they are stored (i.e., location of drain covers, spill kits, or other spill response equipment).
  - In cases where spill kits or sorbent materials are to be used, does the Plan describe the amount of materials available?
  - Are inventory and/or maintenance logs provided to ensure that spill response equipment/materials are currently in good working condition (i.e., not damaged, expired, or used up)?
  - Are the equipment/materials located such that personnel can realistically get to the equipment and deploy it quickly enough to prevent a discharge to navigable waters or adjoining shorelines? That is, are the material and equipment accessible (not locked, key is available), and are they located close enough to the potential source of discharge?

- Description of facility staff responsible for deploying active measures.
  - Are training records up to date?
  - Have the personnel involved in activities for which the active measures might be deployed been trained (i.e., in location of materials, drainage conditions)?
  - Is there sufficiently trained facility staff present at all times to effectively deploy the measures in the event of a discharge?

4.2.8 "Sufficiently Impervious"

Section 112.7(c) states that the entire secondary containment system, "including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system ... will not escape containment before cleanup occurs." With respect to bulk storage containers at onshore facilities (except production facilities), §§112.8(c)(2) and 112.12(c)(2) state that diked areas must be "sufficiently impervious to contain oil." The purpose of the secondary containment requirement is to prevent discharges as described in §112.1(b); therefore, effective secondary containment methods must be able to contain oil until the oil is cleaned up. EPA does not specify permeability or retention time performance criteria for these provisions. Instead, EPA gives the owner/operator and the certifying PE flexibility in determining how best to design the containment system to prevent a discharge as described in §112.1(b). This determination is based on a good engineering practice evaluation of the facility configuration, product properties, and other site-specific conditions. For example, EPA believes that a sufficiently impervious retaining wall, or dike/berm, including the walls and floors, must be constructed so that any discharge from a primary containment system will not escape the secondary containment system before cleanup occurs and before the discharge reaches navigable waters and adjoining shorelines (§§112.7(c), 112.8(c)(2) and 112.12(c)(2)). Ultimately, the determination of imperviousness should be verified by the certifying PE.

The preamble to the 2002 SPCC rule states that "a complete description of how secondary containment is designed, implemented, and maintained to meet the standard of sufficiently impervious is necessary" (67 FR 47102). Therefore, pursuant to §112.7(a)(3)(iii) and (c), the Plan should address how the secondary containment is designed to effectively contain oil until it is cleaned up. Control and/or removal of vegetation may be necessary to maintain the imperviousness of the secondary containment and to allow for the visual detection of discharges. The owner or operator should monitor the conditions of the secondary containment structure to ensure that it remains impervious to oil. Repairs of excavations or other penetrations through secondary containment need to be conducted in accordance with good engineering practice.

The earthen floor of a secondary containment system may be considered "capable of containing oil" until cleanup occurs, or "sufficiently impervious" under §§112.7(c), 112.8(c)(2), and 112.12(c)(2), respectively, if there is no subsurface conduit to navigable waters allowing the oil to reach navigable waters before it is cleaned up. Should oil reach navigable waters or adjoining shorelines, it is a reportable discharge under 40 CFR part 110. The suitability of earthen material for secondary containment systems may depend on the properties of both the product stored and the soil. For example, compacted local soil may be suitable to contain a viscous product, such as liquid asphalt cement, but may not be suitable to contain gasoline. Permeability through the wall (or wall-to-floor interface) of the structure may result in an immediate discharge as described in §112.1(b).

In certain geographic locations the native soil (e.g., clay) may be determined as sufficiently impervious by the PE. However, there are many more instances where good engineering practice would generally not allow the use of a facility's native soil alone as secondary containment because the soil is not homogenous. In fact, certain state requirements may restrict the use of soil as a means of secondary containment, and many state regulations explicitly forbid the discharge of oil on soil. Pennsylvania's Storage Tank and Spill Prevention Act, for example, requires that facilities take immediate steps to prevent injury from any discharge of a substance that has the potential to flow, be washed or fall into waters, and endanger downstream users. The Act requires that residual substances be removed, within 15 days, from the ground or affected waters. Discharges to soil and groundwater may also violate other federal regulations. In addition, the EPA inspector should strongly urge facility owners and operators to investigate and comply with all state and local requirements. An inspector who notices potential violations under other statutes or regulations should contact the appropriate authorities for follow-up with the facility.

In summary, any of the owner/operator's determinations specifying whether secondary containment structures are capable of containing oil until it is cleaned up ("sufficiently impervious") should be made based on good engineering practice and may consider site-specific factors.

4.2.9 Role of the EPA Inspector in Evaluating "Sufficiently Impervious"

The EPA inspector should determine whether the facility's secondary containment is sufficiently impervious, based on a review of the SPCC Plan and on an observation of site conditions. The EPA inspector may ask to see any calculations/engineering justifications used in determining levels of imperviousness; this information, including calculations, should be maintained with the Plan to facilitate the inspector's review. To determine whether secondary containment is sufficiently impervious, the inspector may consider the following:

- Whether the SPCC Plan describes how secondary containment is designed, implemented, and maintained. The certification of the Plan's adequacy is the responsibility of the PE and a determination of sufficient imperviousness may be based strictly on geotechnical knowledge of soil classification and best engineering judgment. The inspector may also review records of hydraulic conductivity tests, if such tests were conducted to ascertain the imperviousness of the secondary containment structure. The inspector may also review drainage records that are required to be kept by the facility owner/operator in accordance with §112.8(c)(3), §112.9(b)(1), or §112.12(c)(3). If, for example, facility personnel never drain the outdoor containment, then the inspector may pose follow-up questions to clarify how the facility removes precipitation after heavy rainfall, since lack of rainfall accumulation could indicate that the water is escaping the containment structure through the walls or floor.

- For bulk storage facilities (excluding production) subject to §112.8 or §112.12, procedures on how the facility minimizes and evaluates the potential for corrosion of container bottoms/bases that cannot be visually inspected. Corrosion of container bottom is addressed in part by integrity testing of bulk storage containers under §112.8(c)(6) or §112.12(c)(6). If a facility owner/operator cannot certify that the material under the container is sufficiently impervious (whether earthen or manmade), the inspector should consider:

  - Whether the inspection and integrity testing program in the Plan includes an internal inspection in the scope of the container integrity testing program in accordance with industry standards. This internal inspection should include the bottom plate. Since the bottom plate cannot be examined from the underside, the only inspection available is to assess the fitness of the bottom plate via an internal inspection. (See Chapter 7 of this document for more information on integrity testing.)
  - Whether the facility has the ability to detect oil discharges from a container bottom in order to commence cleanup before a discharge escapes the containment systems.

- Evidence of stained soil or stressed vegetation outside the containment area as well as at nearby outfalls or other areas affected by runoff from the secondary containment structure. For example, at onshore production facilities, there may be oil stains or white areas and white salt crystal deposits on the outside of berm walls and on the ground surface farther away from the berm. These deposits may indicate that produced water has flowed through the secondary containment and that the structure may not be sufficiently impervious.

- How the secondary containment is constructed (materials and method of construction). Look for the type of soil (if soil is used). Floor and walls constructed of sandy material, for example, may not be appropriate to hold refined products such as gasoline. If earthen material is used, EPA recommends that it have a high clay content and be properly compacted, not simply formed into a mound. Untreated cinder blocks used for containment should be closely evaluated by an inspector due to their porous nature.

- If a facility considers the earthen floor of a secondary containment system to be sufficiently impervious, the inspector should consider any underground pathway that could lead to navigable waters.

4.2.10 Facility Drainage (Onshore Facilities)

Control of Drainage from Dikes and Berms

When containment methods such as dikes and berms are used to satisfy the secondary containment requirements of the rule such as §§112.7(c) and 112.8(c)(2), the specific facility drainage requirements also apply. The specific requirements for diked areas at onshore facilities (except production) are found in §§112.8(b)(1), 112.8(b)(2), 112.12(b)(1), and 112.12(b)(2); for diked areas at onshore production facilities they are found in §112.9(b)(1). Drainage from diked storage areas can be accomplished by several means such as valves, manually activated pumps, or ejectors. If dikes are drained using valves, they must be of manual design to prevent an uncontrolled discharge outside of the dike, such as into a facility drainage system or effluent treatment system, except where facility systems are designed to control such a discharge (§§112.8(b)(1) and 112.12(b)(1)). At oil production facilities, drains on secondary containment systems (both dikes and other equivalent measures required under §112.7(c)(1)) must be closed and sealed at all times, except when draining uncontaminated rainwater (§112.9(b)(1)). Although not required by the rule, owners and operators should strongly consider locking valves controlling dike or remote impoundment areas, especially when they can be accessed by non-facility personnel.

For diked areas serving as secondary containment for bulk storage containers, §§112.8(c)(3) and 112.12(c)(3) require that storm water accumulations be inspected for the presence of oil and records of the drainage events must be maintained. Section 112.9(b)(1) requires that oil production facilities comply with the same drainage procedures for diked areas as other types of onshore facilities under §112.8(c)(3)(ii) through (iv). EPA inspectors should evaluate facility records to verify compliance with the drainage procedures described in §112.8(c)(3). Any storm water discharge records maintained at the facility in accordance with the NPDES rules in §122.41(j)(2) or 122.41(m)(3) are acceptable under §§112.8(c)(3)(iv) and 112.12(c)(3)(iv).

§§112.8(b) and 112.12(b) *Facility drainage*.
(1) Restrain drainage from diked storage areas by valves to prevent a discharge into the drainage system or facility effluent treatment system, except where facility systems are designed to control such discharge. You may empty diked areas by pumps or ejectors; however, you must manually activate these pumps or ejectors and must inspect the condition of the accumulation before starting, to ensure no oil will be discharged.
(2) Use valves of manual, open-and-closed design, for the drainage of diked areas. You may not use flapper-type drain valves to drain diked areas. If your facility drainage drains directly into a watercourse and not into an on-site wastewater treatment plant, you must inspect and may drain uncontaminated retained stormwater, as provided in paragraphs (c)(3)(ii), (iii), and (iv) of this section.
(3) Design facility drainage systems from undiked areas with a potential for a discharge (such as where piping is located outside containment walls or where tank truck discharges may occur outside the loading area) to flow into ponds, lagoons, or catchment basins designed to retain oil or return it to the facility. You must not locate catchment basins in areas subject to periodic flooding.
(4) If facility drainage is not engineered as in paragraph (b)(3) of this section, equip the final discharge of all ditches inside the facility with a diversion system that would, in the event of an uncontrolled discharge, retain oil in the facility.
(5) Where drainage waters are treated in more than one treatment unit and such treatment is continuous, and pump transfer is needed, provide two "lift" pumps and permanently install at least one of the pumps. Whatever techniques you use, you must engineer facility drainage systems to prevent a discharge as described in §112.1(b) in case there is an equipment failure or human error at the facility.

Note: The above text is an excerpt of the SPCC rule. Refer to 40 CFR part 112 for the full text of the rule.

Facility Drainage Control

When secondary containment requirements are addressed through facility drainage controls, the requirements in §112.8(b)(3) and (4), or §112.12(b)(3) and (4) apply. For example, a facility may choose to use the existing storm drainage system to meet secondary containment requirements by channeling discharged oil to a remote containment area to prevent a discharge as described in §112.1(b). The facility drainage system must be designed to flow into ponds, lagoons, or catchment basins designed to retain oil or return it to the facility. Catchment basins must not be located in areas subject to periodic flooding (§§112.8(b)(3) and 112.12(b)(3)).

A facility does not have to address the undiked area requirements of §112.8(b)(3) and (4) or §112.12(b)(3) and (4) if the facility does not use drainage systems to meet one of the secondary containment requirements in the SPCC rule. For example, if the SPCC Plan documents the use of an active containment measure (such as a combination of sorbents and a spill mat), which is effective to prevent a discharge as described in §112.1(b), then secondary containment has been provided and it is not necessary to alter drainage systems at the facility. The facility drainage system design requirements in §112.8(b)(3) and (4) or §112.12(b)(3) and (4) apply only when the facility uses these drainage systems to comply with the secondary containment provisions of the rule such as §§112.7(c) and 112.8(c)(2).

The EPA inspector should determine if the facility's documentation in the Plan identifies whether the final ponds, lagoons, or catchment basins are designed/sized to meet the appropriate general and/or specific secondary containment requirements. The following examples help to illustrate how to determine the appropriate size of the ponds, lagoons, or catchment basins:

- **General Secondary Containment.** A facility owner/operator may use a storm water drainage system that flows to a containment pond to address the general containment requirements of §112.7(c) for a piece of operational equipment (including electrical oil-filled equipment). The pond/drainage system should be designed to contain the volume of oil likely to be discharged as determined according to good engineering practice and documented in the SPCC Plan. The capacity of the secondary containment required is that which is necessary to meet the general containment requirement based on a likely discharge (not necessarily a major container failure).

- **Specific Secondary Containment.** If a facility owner/operator uses a storm water drainage system that flows to a catchment basin to comply with the specific containment requirements of §112.8(c)(2) for a bulk storage container, the pond/drainage system must be designed to contain the capacity of the largest bulk storage container (with appropriate freeboard for precipitation) as dictated by the rule's requirements. The specific containment requirement is based on a major container failure in which the entire capacity of the container is discharged.

- **General and Specific Secondary Containment.** In a case where a drainage system to a final catchment basin is used to meet multiple secondary containment needs for the facility, including compliance with both general and specific containment requirements, the system's design will need to meet the most stringent rule requirement (typically the specific secondary containment requirement).

The facility drainage requirements of §§112.8(b) and 112.12(b) are design standards for secondary containment (not additional secondary containment requirements) and are therefore eligible for deviations that provide equivalent environmental protection in compliance with §112.7(a)(2) and as determined appropriate by a PE. Chapter 3 of this guidance document, Environmental Equivalence, includes a further discussion on ways to evaluate whether facility drainage systems that deviate from the specified design standards are "environmentally equivalent" and comply with §112.7(a)(2).

4.2.11 Role of the EPA Inspector in Evaluating Onshore Facility Drainage

The EPA inspector should review the facility's SPCC Plan to ensure that the drainage procedures are documented and records are maintained. The inspector should also examine the facility to determine whether the drainage procedures are implemented as described in the SPCC Plan and whether they are appropriate for the facility. If a facility uses drainage systems to meet one or more secondary containment requirements, the inspector should evaluate whether the final ponds, lagoons, or catchment basins are designed/sized in accordance with the appropriate general and/or specific secondary containment requirements. The inspector should also evaluate the facility records to verify compliance with the drainage procedures described in §112.8(c)(3).

4.3 Overview of the Impracticability Determination Provision

EPA recognizes that, although engineered passive containment systems (such as dikes and drainage systems) or active secondary containment approaches are preferable, they may not always be practicable. If a facility owner/operator finds that containment methods are "impracticable," alternative modes of protection to prevent and contain oil discharges are available. The impracticability provision found in §112.7(d) allows facility owners/operators to substitute a combination of other measures in place of secondary containment: (1) periodic integrity testing of bulk storage containers and periodic integrity testing and leak testing of the valves and piping associated with the containers; (2) unless they have submitted a Facility Response Plan (FRP) under §112.20, an oil spill contingency plan; and (3) a written commitment of manpower, equipment, and materials required to control and remove any quantity of oil discharged that may be harmful.

> **§112.7(d)**
> If you determine that the installation of any of the structures or pieces of equipment listed in paragraphs (c) and (h)(1) of this section, and §§112.8(c)(2), 112.8(c)(11), 112.9(c)(2), 112.10(c), 112.12(c)(2), 112.12(c)(11), 112.13(c)(2), and 112.14(c) to prevent a discharge as described in §112.1(b) from any onshore or offshore facility is not practicable, you must clearly explain in your Plan why such measures are not practicable; for bulk storage containers, conduct both periodic integrity testing of the containers and periodic integrity and leak testing of the valves and piping; and, unless you have submitted a response plan under §112.20, provide in your Plan the following:
> (1) An oil spill contingency plan following the provisions of part 109 of this chapter.
> (2) A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful.
>
> Note: The above text is an excerpt of the SPCC rule. Refer to 40 CFR part 112 for the full text of the rule.

If an impracticability determination is made, the SPCC Plan must clearly describe why secondary containment measures are impracticable and how the specified additional measures are implemented (§112.7(d)). See Section 4.5 of this chapter for more information on the additional measures. The option of determining impracticability assumes that it is feasible to effectively and reliably implement a contingency plan. Facilities should be aware that an impracticability determination may affect the applicability of the FRP requirements under 40 CFR part 112 subpart D. In addition, an impracticability determination may affect the calculation of the worst case discharge volume, which may impact the amount of resources required to respond to a worst case discharge scenario.

4.3.1 Meaning of "Impracticable"

The impracticability determination is intended to be used when a facility owner/operator is incapable of installing secondary containment by any reasonable method. Considerations include space and geographical limitations, local zoning ordinances, fire codes, safety, or other good engineering practice reasons that would not allow for secondary containment (67 FR 47104). EPA clarified in a *Federal Register* notice that economic cost may be considered as one element in a decision on alternative methods, consistent with good engineering practice for the facility, but may not be the only determining factor in claiming impracticability (see text box below).

Notice Concerning Certain Issues Pertaining to the July 2002 Spill Prevention, Control, and Countermeasure (SPCC) Rule

"The Agency did not intend with [preamble language at 67 FR 47104] to opine broadly on the role of costs in determinations of impracticability. Instead, the Agency intended to make the narrower point that secondary containment may not be considered impracticable solely because a contingency plan is cheaper. (This was the concern that was presented by the commenter to whom the Agency was responding.) ...

In addition, with respect to the emphasized language enumerating considerations for determinations of impracticability, the Agency did not intend to foreclose the consideration of other pertinent factors. In fact, in the response-to-comment document for the SPCC amendments rulemaking, the Agency stated that "... for certain facilities, secondary containment may not be practicable because of geographic limitations, local zoning ordinances, fire prevention standards, *or other good engineering practice reasons*."

The above text is an excerpt from 69 FR 29728 (May 25, 2004).

4.4 Selected Issues Related to Secondary Containment and Impracticability Determinations

Section 112.7(d) lists the provisions of the SPCC rule for which facility owners or operators may determine impracticability. Issues related to the use of impracticability determinations for selected secondary containment requirements are discussed below. Requirements under each provision are summarized below, along with a discussion of selected issues. Only secondary containment requirements can be determined to be impracticable; for most other technical requirements, the rule provides flexibility to facility owners or operators to implement alternative measures that provide equivalent environmental protection (see Chapter 3 of this guidance document for more information on the environmental equivalence provision).

4.4.1 General Secondary Containment Requirements, §112.7(c)

The secondary containment requirements found in §112.7(c) apply to any area within a regulated facility where a discharge may occur. Piping, flowlines, non-bulk containers such as oil-filled operational equipment and manufacturing equipment, and non-rack transfer areas are subject to the general secondary containment requirements. A discussion of issues related to secondary containment for piping and flowlines, transfer areas, and certain oil-filled equipment follows.

Piping and Flowlines

Examination of discharge reports from the Emergency Response Notification System (ERNS) shows that discharges from valves, piping, flowlines, and appurtenances are much more common than catastrophic tank failure or discharges from tanks (67 FR 47124). To prevent a discharge as described in §112.1(b), all piping, including buried piping and flowlines, at regulated facilities must comply with the general secondary containment requirements contained in §112.7(c).

In certain cases, secondary containment for piping will be possible. Section 112.7(c) provides flexibility in the method of secondary containment: active measures including land-based response capability, sorbent materials, drainage systems, and other equipment are acceptable. Section 112.7(c) does not prescribe a specific containment size for piping and flowlines; however, good engineering practice prescribes that containment size should be based on the magnitude of a reasonable discharge scenario, taking into consideration the specific features of the facility and operation. A determination of adequate secondary containment should consider the reasonably expected sources, maximum flow rate, duration of a discharge, and detection capability. The EPA inspector should ensure that the secondary containment method for piping and flowlines is documented in the SPCC Plan and that the PE has certified that the method is appropriate for the facility according to good engineering practice. If active methods of containment are selected, the facility personnel should be able to demonstrate that they can effectively deploy these measures to contain a potential spill before it reaches navigable waters or adjoining shorelines.

EPA acknowledges that in many cases, secondary containment may not be practicable for flowlines and gathering lines. For example, a production facility in a remote area may have many miles of flowlines and gathering lines, around which it would not be practicable to build permanent containment structures. For instance, it may not be possible to install secondary containment around flowlines running across a farmer's or rancher's fields since berms may become severe erosional features of the fields and can impede access to the fields by farm/ranch tractors and other equipment. Similarly, it may be impracticable to construct secondary containment around flowlines that run along a fence line or county road due to space limitations or intrusion into a county's property or right-of-way. At unmanned facilities, the use of active secondary containment methods is not possible because there is limited capability to detect a discharge and deploy active measures in a timely fashion. If secondary containment is not practicable, facility owners/operators may make an impracticability determination and comply with the additional regulatory requirements described in §112.7(d).

The preamble of the 2002 SPCC rule (67 FR 47078) states that the contingency plan required when secondary containment is not practicable for flowlines and gathering lines should rely on strong maintenance, corrosion protection, testing, recordkeeping, and inspection procedures to prevent and quickly detect discharges from such lines. It should also ensure quick availability and deployment of response equipment. The integrity testing program for piping and valves should also be developed in accordance with good engineering practice, in order to prevent a discharge as described in §112.1(b). A flowline maintenance program is required for production facilities under §112.9(d)(3). (See Chapter 7 of this document for a summary of the recommended key elements of a flowline maintenance program.) It is especially important that facility owners or operators who determine that secondary containment is impracticable implement a comprehensive flowline maintenance program. If an impracticability determination is made for flowlines or gathering lines, EPA inspectors should extensively and carefully review the adequacy of the flowline maintenance program. According to practices recommended by industry groups such as API, a comprehensive piping program should include the following elements:

- **Prevention measures** that avert the discharge of fluids from primary containment;
- **Detection measures** that identify a discharge or potential for a discharge;
- **Protection measures** that minimize the impact of a discharge; and
- **Remediation measures** that mitigate discharge impacts by relying on limited or expedited cleanup.

In order for a contingency plan to be effective, it is essential for discharges to be detected in a timely manner. Good engineering practice may require that unmanned facilities where secondary containment is impracticable be inspected more frequently than would be required at a typical unmanned facility where secondary containment is provided. For facilities that do not have a Facility Response Plan (FRP) pursuant to §112.20, if it is not feasible to effectively and reliably implement a contingency plan, owners/operators must determine how to comply with the applicable secondary containment requirements in §112.7(c). A contingency plan or FRP is required when a determination of impracticability is made, pursuant to §112.7(d).

Transfer Areas

A transfer operation is one in which oil is moved from or into some form of transportation, storage, equipment, or other device, into or from some other or similar form of transportation, such as a pipeline, truck, tank car, or other storage, equipment, or device (67 FR 47130). Areas where oil is transferred but no loading or unloading rack is present are subject to §112.7(c), and thus appropriate containment and/or diversionary structures are required. EPA does not require specifically sized containment for transfer areas; however, containment size must be based on good engineering practice (§112.3(d)).

The containment requirement at §112.7(c) applies to both loading and unloading areas. Examples of activities that occur within transfer areas include:

- Unloading oil from a truck to a heating oil tank;
- Loading oil into a vehicle from a dispenser; and
- Transferring crude oil from an oil production tank battery into tank trucks.

Secondary containment size should be based on the magnitude of a most likely discharge, taking into consideration the specific features of the facility and operation. Specific features of different loading/unloading operations include the hardware, procedures, and personnel who are able to take action to limit the volume of a discharge. EPA recommends that a determination of adequate secondary containment consider:

- **The reasonably expected sources and causes of a discharge.** This could be a failed hose connection; failed valve; overfill of a container, tank truck, or railroad tank car; or breach of a container. Determination would be based on the type of transfer operation, facility experience and spill history, potential for human error, etc.
- **The reasonably expected maximum rate of discharge.** This will be dependent on the mode of failure. It may be equal to the maximum rate of transfer or the leakage rate from a breached container.
- **The ability to detect and react to the discharge.** This will be dependent on the availability of monitoring instrumentation for prompt detection of a discharge and/or the proximity of personnel to detect and respond to the discharge.
- **The reasonably expected duration of the discharge.** This will be dependent on the availability of manual or automatic isolation valves, the proximity of qualified personnel to the operation, and other factors that may limit the volume of a discharge.
- **The time it would take a discharge to impact navigable waters or adjoining shorelines.** This could depend on the proximity to waterways and storm drains, and the slope of the ground surface between the loading area and the waterway or drain.

An example calculation of secondary containment size, based on these considerations, is provided in Figure 4-7.

Figure 4-7. Sample calculation of appropriate secondary containment capacity at a transfer area.

Scenario:
A fuel truck is loading oil into a heating oil tank at a regulated facility, with an attendant present throughout the operation.

Details:

- The truck is loading at a rate of **150** gallons per minute.
- The reasonably expected source and cause of a discharge is a ruptured hose connection.
- A shutoff valve is present on the loading line and is accessible to the attendant.
- An evaluation determines that the discharge will not impede the attendant's access to the shutoff valve and that he can safely close the valve within 10 seconds of the hose connection rupture, based on past experience under similar circumstances; 15 seconds is assumed to be a conservative estimate of the response time.

Calculations:
The maximum reasonably expected discharge would be calculated to be 150 gallons:

[(150 gal/min) x (1 min/60 sec) x (15 sec)] = 37.5 gallons

Conclusion:
Secondary containment volume should be at least 37.5 gallons. A larger volume for secondary containment would be needed if time required to safely close the shutoff valve takes longer than 10 seconds.

A number of other factors may also affect the appropriate volume for secondary containment at loading and unloading areas. These factors include a variable rate of transfer; the ability to control a discharge from a breached container, if such a breach is reasonably expected to occur; the availability of personnel in close proximity to the operations and the necessary time to respond; the presence or absence of monitoring instrumentation to detect a discharge; the type and location of valving that may affect the probable time needed to stop the discharge; and the presence or absence of automatic valve actuators. These are a few examples of the factors that a PE may consider when reviewing the adequacy of secondary containment systems at a facility. The EPA inspector may consider the same factors when assessing the adequacy of secondary containment.

Secondary containment structures, such as dikes or berms, may not be appropriate in areas where vehicles continuously need access; however, curbing, drainage systems, active measures, or a combination of these systems can adequately fulfill the secondary containment requirements of §112.7(c). A facility owner or operator may implement methods for secondary containment other than dikes or berms. For example, a transfer truck loading area at an onshore oil production facility may be designed to drain discharges away to a topographically lower area using a crescent or eyebrow-shaped berm. EPA acknowledges that in certain situations, secondary containment at transfer areas may be impracticable due to geographic limitations, fire codes, etc. In these cases, owners/operators may determine that secondary containment is impracticable under §112.7(d), and must clearly explain the reasons why secondary containment is not practicable and comply with the additional regulatory requirements.

Oil-Filled Equipment

Secondary containment may be impracticable for oil-filled equipment (e.g., vaulted transformers, hydraulic units associated with an elevators/lifts, pad-mounted transformers at customer sites, and oil-filled cable systems) that are not readily accessible or cross properties belonging to different owners. In these cases, the SPCC Plan must clearly explain the reasons why secondary containment is not practicable and comply with the additional regulatory requirements under §112.7(d). For more information on oil-filled operational equipment, refer to Section 2.8.2 of this guidance document.

4.4.2 Secondary Containment Requirements for Loading/Unloading Racks, §112.7(h)(1)

Section 112.7(h) applies to areas at regulated facilities where traditional loading/unloading racks for tank cars and tank trucks are located. Loading and unloading racks are subject to the specific secondary containment requirements in §112.7(h)(1).

EPA inspectors should evaluate compliance with the requirements of §112.7(h) for equipment traditionally considered to be "loading racks." While the SPCC rule does not provide a definition for the term "rack," the type of equipment for which these requirements would typically apply has the following characteristics:

> **§112.7(h)**
> *Facility tank car and tank truck loading/unloading rack (excluding offshore facilities)*.
> (1) Where loading/unloading area drainage does not flow into a catchment basin or treatment facility designed to handle discharges, use a quick drainage system for tank car or tank truck loading and unloading areas. You must design any containment system to hold at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded at the facility.
>
> Note: The above text is an excerpt of the SPCC rule. Refer to 40 CFR part 112 for the full text of the rule.

- The equipment is a permanent structure for loading or unloading a tank truck or tank car that is located at a regulated facility.
- The equipment may be comprised of piping assemblages, valves, loading arms, pumps, or a similar combination of devices.
- The system is necessary to load or unload tank trucks or tank cars.
- The system may also include shut-off devices and overfill sensors.

EPA clarified that the provisions of §112.7(h) apply only in instances where a rack structure is present. (See text box below.)

Loading racks can be located at any type of facility; however, the loading areas associated with a production tank battery generally do not have the equipment described above, which is often associated with a "loading rack." Loading/unloading areas utilizing a single hose and connection or standpipe are not considered "racks."

Notice Concerning Certain Issues Pertaining to the July 2002 Spill Prevention, Control, and Countermeasure (SPCC) Rule

"[W]e interpret §112.7(h) only to apply to loading and unloading 'racks.' Under this interpretation, if a facility does not have a loading or unloading 'rack,' §112.7(h) does not apply. Thus, in stating that section 112.7(h) applies to 'all facilities, including production facilities,' the Agency only meant that the provision applies *if* a 'facility' happens to have a loading or unloading rack present. The Agency did not mean to imply that any particular category of facilities, such as production facilities, are likely to have loading or unloading racks present."

The above text is an excerpt from 69 FR 29728 (May 25, 2004).

Where drainage from the areas surrounding a loading/unloading rack does not flow into a catchment basin or treatment facility designed to handle discharges, facility owners and operators must use a quick drainage system (§112.7(h)(1)). A "quick drainage system" is a device that drains oil away from the loading/unloading area to some means of secondary containment or returns the oil to the facility. Section 112.7(h)(1) requires a sized secondary containment system: the containment must hold at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded at the facility.

Loading and unloading activities that take place beyond the rack area are not subject to the requirements of §112.7(h), but are subject, where applicable, to the general containment requirements of §112.7(c). For more information on these requirements, see Section 4.4.1, Transfer Areas.

Letter to Petroleum Marketers Association of America

"[T]he Agency does not interpret §112.7(h) to apply beyond activities and/or equipment associated with tank car and tank truck loading/unloading racks. Therefore, loading and unloading activities that take place beyond the rack area would not be subject to the requirements of 40 CFR §112.7(h) (but, of course, would be subject, where applicable, to the general containment requirements of 40 CFR §112.7(c))."

The above text is an excerpt from a letter to Daniel Gilligan, President, Petroleum Marketers Association of America, from Marianne Lamont Horinko, Assistant Administrator, EPA, May 25, 2004. Found at www.epa.gov/oilspill/pdfs/PMAA_letter.pdf.

Figures 4-8 and 4-9 illustrate how SPCC secondary containment requirements apply at two facilities with loading/unloading areas and with equipment that may be considered loading/unloading racks. In Figure 4-8, the facility has two separate and distinct areas for transfer activities. One is a tank truck unloading area and the other contains a tank truck loading rack. The unloading area contains no rack structure, so the secondary containment requirements of §112.7(c) apply. The requirements of §112.7(h)(1) apply to the area surrounding the loading rack. It should be noted that the presence of a loading rack at one location of a facility does not subject other loading or unloading areas in a separate part of the facility to the requirements of §112.7(h).

In Figure 4-9, the tank truck loading rack and unloading area are co-located. In this situation, the more stringent provision applies; the area is subject to the sized secondary containment requirements of §112.7(h)(1).

EPA acknowledges that in certain situations, the sized secondary containment requirements of §112.7(h)(1) at loading/unloading racks may be impracticable due to geographic limitations, fire codes, etc. In these cases, the owner or operator may determine that secondary containment is impracticable as provided in §112.7(d). Under that provision, the SPCC Plan must clearly explain the reasons why secondary containment is not practicable, and comply with the additional regulatory requirements.

Figure 4-8. Facility with separate unloading area and loading rack. The tank truck unloading area is subject to §112.7(c). The tank truck loading rack is subject to §112.7(h)(1).

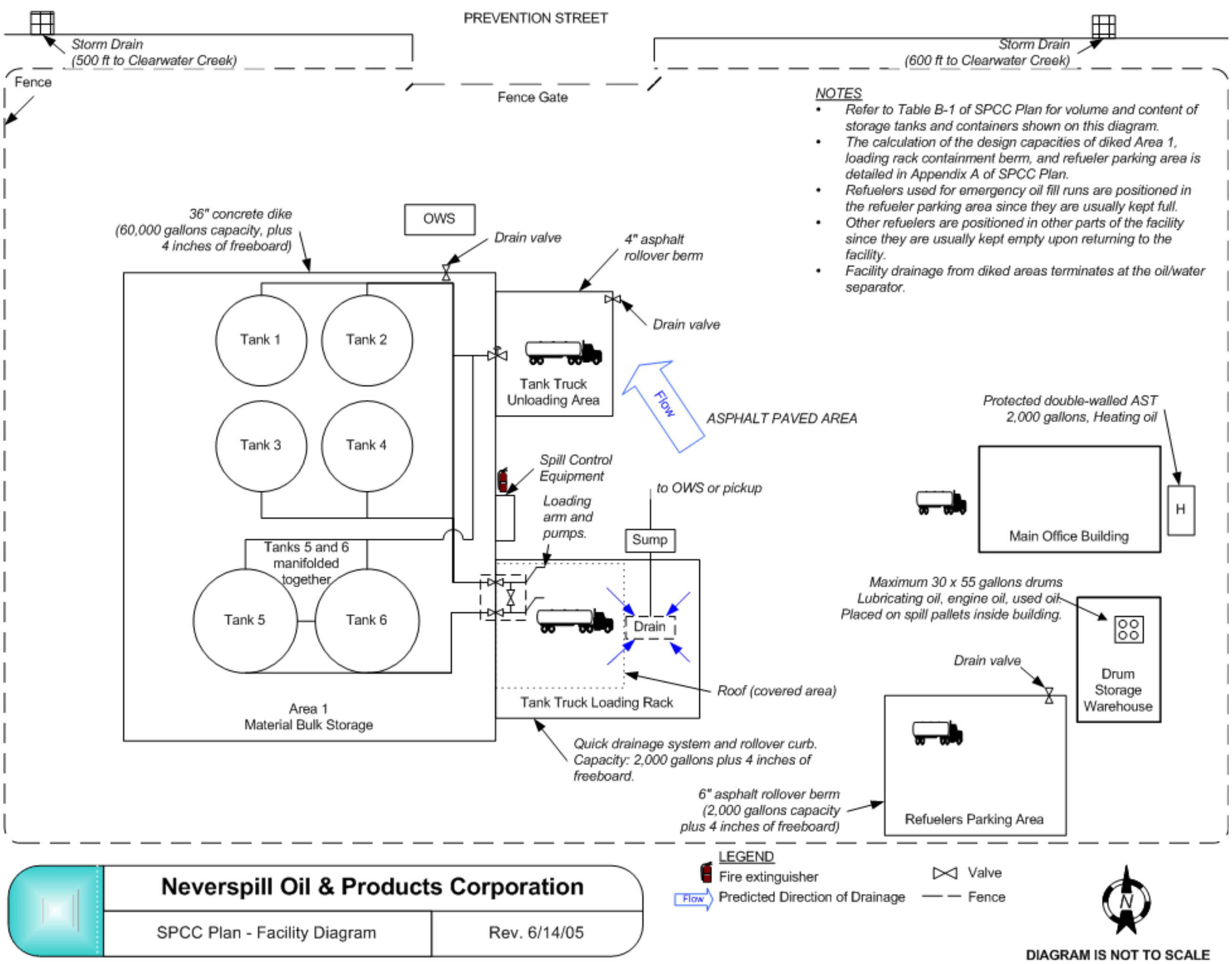
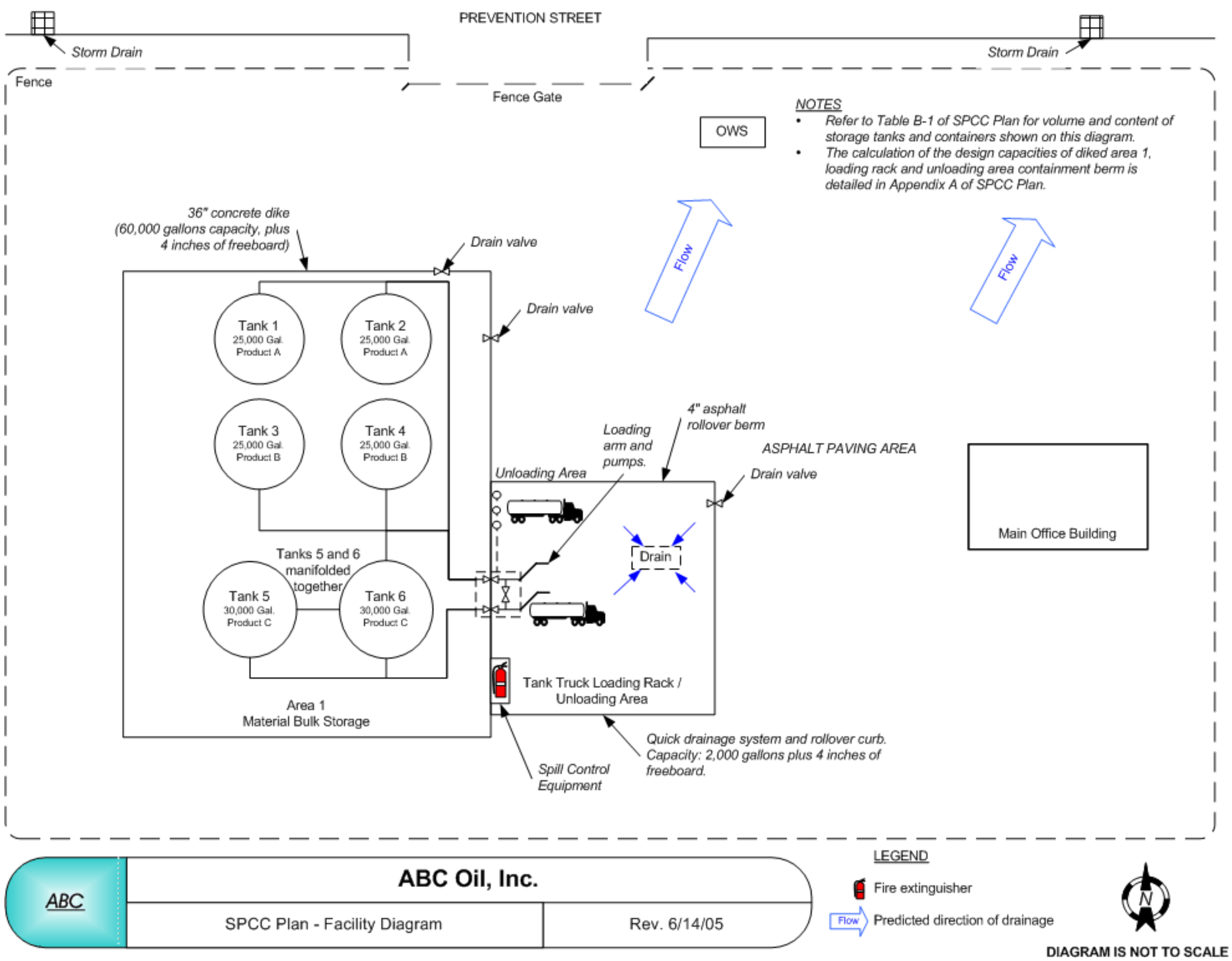


Figure 4-9. Facility with co-located unloading area and loading rack. This containment area is designed to meet the more stringent §112.7(h)(1) provision.



4.4.3 Secondary Containment Requirements for Onshore Bulk Storage Containers, §112.8(c)(2)

> **§§112.8(c)(2) and 112.12(c)(2)**
> Construct all bulk storage container installations so that you provide a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. You must ensure that diked areas are sufficiently impervious to contain discharged oil. Dikes, containment curbs, and pits are commonly employed for this purpose. You may also use an alternative system consisting of a drainage trench enclosure that must be arranged so that any discharge will terminate and be safely confined in a facility catchment basin or holding pond.
>
> Note: The above text is an excerpt of the SPCC rule. Refer to 40 CFR part 112 for the full text of the rule.

Under the SPCC rule, a bulk storage container is any container used to store oil with a capacity of 55 gallons or more (§§112.1(d)(5) and 112.2). Bulk storage containers are used for purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce. Oil-filled pieces of electrical, operating, or manufacturing equipment are not considered bulk storage containers.

Bulk storage containers at a regulated facility must comply with the specific secondary containment requirements of §112.8(c)(2). For bulk storage containers, secondary containment must hold the entire capacity of the largest single container and sufficient freeboard to contain precipitation. (For more information on sufficient freeboard, see the discussion in Section 4.2.4 of this chapter.) Secondary containment is required for all facilities with bulk storage containers, large or small, manned or unmanned, and for facilities with bulk storage containers that also have oil-filled equipment (specific secondary containment requirements do not apply to oil-filled equipment).

Section 112.8(c)(2) considers the use of dikes, containment curbs, and pits as secondary containment methods, or an alternative system consisting of a drainage trench enclosure that must be arranged so that any discharge will terminate and be safely confined in a facility catchment basin or holding pond. Dikes contain oil in the immediate vicinity of the storage container. Remote impoundment drains discharge to an area located away from the container. Examples of design considerations and requirements for these types of containment are set forth in the National Fire Protection Association (NFPA) 30 Flammable and Combustible Liquids Code.

The owner or operator may determine that secondary containment is impracticable under §112.7(d), when he/she, or the PE certifying the Plan, determines that it is not practicable to design a secondary containment system that can hold the capacity of the largest single container plus sufficient freeboard. The EPA inspector should verify that the SPCC Plan clearly explains why secondary containment is not practicable, and that the facility is complying with the additional regulatory requirements, such as conducting both periodic integrity testing of the containers and periodic integrity and leak testing of the valves and piping (§112.7(d)). For further information on the additional regulatory requirements, see Section 4.5 of this guidance.

4.4.4 Secondary Containment Requirements for Mobile/Portable Containers, §112.8(c)(11)

> **§§112.8(c)(11) and 112.12(c)(11)**
> Position or locate mobile or portable oil storage containers to prevent a discharge as described in §112.1(b). You must furnish a secondary means of containment, such as a dike or catchment basin, sufficient to contain the capacity of the largest single compartment or container with sufficient freeboard to contain precipitation.
>
> Note: The above text is an excerpt of the SPCC rule. Refer to 40 CFR part 112 for the full text of the rule.

Mobile or portable oil storage containers operating exclusively within the confines of a non-transportation-related facility with a capacity to store 55 gallons or more of oil are regulated under the SPCC rule and must comply with the secondary containment requirements of §112.8(c)(11) (or §112.12(c)(11) in the case of a facility that stores or handles animal fats or vegetable oils).

The 1971 Memorandum of Understanding between EPA and the Department of Transportation (DOT) states that "highway vehicles and railroad cars which are used for the transport of oil exclusively within the confines of a non-transportation-related facility and which are not intended to transport oil in interstate or intrastate commerce" are considered non-transportation-related, and therefore fall under EPA's regulatory jurisdiction. For example, some oil refinery tank trucks and fueling trucks dedicated to a particular facility (such as a construction site, military base, or similar large facility) fall under this category. Other examples of mobile portable containers include, but are not limited to, 55 gallon drums, skid tanks, totes, and intermodal bulk containers.

Vehicles used to store oil, operating as on-site fueling vehicles at locations such as construction sites, military, or civilian remote operations support sites, or rail sidings are generally considered non-transportation-related. Indicators describing when a vehicle is intended to be used as a storage tank (and therefore considered non-transportation-related) include, but are not limited to:

- The vehicle is not licensed for on-road use;
- The vehicle is no longer mobile (i.e., hard-piped or permanently parked);
- The vehicle is fueled on-site and never moves off-site; and
- The vehicle is parked on a home-base facility and is filled up off-site but then returns to the home base to fuel other equipment located exclusively within the home-base facility, and only leaves the site to obtain more fuel.

According to §§112.8(c)(11) and 112.12(c)(11), mobile or portable containers must be positioned or located to prevent a discharge to navigable waters as described in §112.1(b). The provision requires that the secondary containment be sized to hold the capacity of the largest single compartment or container with sufficient freeboard to contain precipitation.

The appropriate containment methods for mobile containers may vary depending on the activity in which the container is engaged at a given time. Thus, secondary containment requirements may be met differently depending upon the type of operation being performed, as described in the examples below.

When mobile containers are in a stationary, unattended mode and not under the direct oversight or control of facility personnel, the requirements of §§112.8(c)(11) and 112.12(c)(11) may be met through the use of permanent secondary containment methods, such as dikes, curbing, drainage systems, and catchment basins. In order to comply with this requirement, an owner/operator may designate an area of the facility in which to locate mobile containers when not in use; this area must be designed, following good engineering practices, to hold the capacity of the largest single compartment or container with sufficient freeboard to contain precipitation. The area designated for mobile equipment must be identified on the facility diagram provided within the SPCC Plan (§112.7(a)(3)).

When mobile containers are involved in activities such as normal fuel transfer, on-site movement, or preparation for such activities in "stand-by" mode, the requirements of §112.8(c)(11) do not apply because the container is not "positioned" and therefore the less stringent requirements of §112.7(c) apply. This requirement may be satisfied through the use of drainage systems that could ultimately control spilled oil. Alternatively, other measures listed in the general secondary containment provision under §112.7(c) may be used, including active measures such as sorbents, booms, or response actions that prevent an oil discharge from reaching navigable waters and adjoining shorelines. In these cases, a member of the facility personnel should (as determined by good engineering practice) be in physical control and attending to the mobile or portable storage container. When the mobile refueler is not engaged in one of the activities listed above, it must be positioned to prevent a discharge and provided with secondary containment large enough for the single compartment or container with sufficient freeboard for precipitation (§112.8(c)(11)).

Mobile containers, such as drums, skids, and totes, must also comply with the requirements of §112.8(c)(11) or §112.12(c)(11) according to good engineering practice. For these types of containers, the EPA inspector should verify that the secondary containment methods are appropriate. For example, an oil-filled drum positioned for use at a construction site must be equipped with secondary containment sized in accordance with §112.8(c)(11). The facility owner or operator may determine that it is impracticable to provide sized secondary containment in accordance with §112.8(c)(11), when the container is in stationary or unattended mode, or the general containment of §112.7(c), pursuant to §112.7(d). The SPCC Plan must properly explain why secondary containment is impracticable, and document the implementation of the additional regulatory requirements of §112.7(d).

4.4.5 Secondary Containment Requirements for Bulk Storage Containers at Production Facilities, §112.9(c)(2)

> **§112.9(c)(2)**
> Provide all tank battery, separation, and treating facility installations with a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. You must safely confine drainage from undiked areas in a catchment basin or holding pond.
>
> Note: The above text is an excerpt of the SPCC rule. Refer to 40 CFR part 112 for the full text of the rule.

The secondary containment requirements of §112.9(c)(2) apply to all tank battery, separation, and treating facility installations at a regulated production facility. This specific secondary containment requirement does not apply to the entire lease area, but only to tanks, vessels, and containers in the tank battery, separation, and treatment areas.

Section 112.9(c)(2) is a specific secondary containment requirement; the containment structure or measure must be able to contain the entire capacity of the largest single container and sufficient freeboard to contain precipitation. (Refer to Section 4.2.4 of this chapter for more information on calculating sufficient freeboard.) Additionally, pursuant to §112.9(c)(2), if facility drainage is used as a method of secondary containment for bulk storage containers, drainage from undiked areas must be safely confined in a catchment basin or holding ponds. Secondary containment should be sufficiently impervious to contain oil; refer to Section 4.2.8 of this chapter for more information. The undiked drainage requirements of §112.9(c)(2) do not apply to other areas of the facility or lease, such as truck transfer or wellhead or flowline areas because they are not bulk storage containers. According to the 2002 rule preamble, "the [secondary containment] requirement applies to oil leases of any size. Secondary containment is not required for the entire leased area, merely for the contents of the largest single container in the tank battery, separation, and treating facility installation, with sufficient freeboard to contain precipitation." (67 FR 47128).

The facility owner/operator may determine that it is impracticable to provide sized secondary containment in accordance with §112.9(c)(2). Pursuant to §112.7(d), the SPCC Plan must clearly explain why secondary containment is not practicable, and document how the additional regulatory requirements of §112.7(d) are implemented. Owners or operators of unmanned facilities may need to determine how to effectively implement a contingency plan. This may involve additional site inspections, or some other method as determined appropriate by a Professional Engineer.

☞ **Tip**
Because a pit used as a form of secondary containment may pose a threat to birds and wildlife if oil is present in the pit, EPA encourages owners or operators who use a pit to take measures to mitigate the effect of the pit on birds and wildlife. Such measures may include netting, fences, or other means to keep birds or animals away. In some cases, pits may also cause a discharge as described in §112.1(b). The discharge may occur when oil spills over the top of the pit or when oil seeps through the ground into the groundwater, and then to navigable waters or adjoining shorelines. Therefore, EPA recommends that an owner or operator not use pits in an area where such pit may prove a source of such discharges. Should the oil reach navigable waters or adjoining shorelines, it is a reportable discharge under 40 CFR 110.6. (67 FR 47116)

4.4.6 Secondary Containment Requirements for Onshore Drilling or Workover Equipment, §112.10(c)

Section 112.10(c) applies to onshore oil drilling and workover facilities. Areas with drilling and workover equipment are required to provide catchment basins or diversion structures to intercept and contain discharges of fuel, crude oil, or oily drilling fluids. This provision contains no specific sizing requirement, and no freeboard requirement; it is essentially very similar to the general containment requirement of §112.7(c).

§112.10(c)
Provide catchment basins or diversion structures to intercept and contain discharges of fuel, crude oil, or oily drilling fluids.

Note: The above text is an excerpt of the SPCC rule. See 40 CFR part 112 for the full text of the rule.

The facility owner/operator may determine that it is impracticable to provide secondary containment in accordance with §112.10(c). Pursuant to §112.7(d), the SPCC Plan must clearly explain why secondary containment is not practicable, and document how the additional regulatory requirements of §112.7(d) are implemented.

4.5 Measures Required in Place of Secondary Containment

Pursuant to §112.7(d), if secondary containment is impracticable for any area where secondary containment requirements apply, facility owners or operators must clearly explain in the SPCC Plan why such secondary containment is impracticable and implement additional requirements. This section describes these additional requirements.

4.5.1 Integrity Testing of Bulk Storage Containers

When a facility owner or operator shows that secondary containment around a bulk storage container is impracticable, he or she must conduct periodic integrity testing of the container (§112.7(d)). Integrity testing is any means to measure the strength (structural soundness) of the container shell, bottom, and/or floor to contain oil. Integrity testing should be done in accordance with good engineering practice, considering applicable industry standards. For a thorough discussion of integrity testing, see Chapter 7 of this document. Chapter 7 describes the scope and frequency of inspections and tests, considering industry standards and the characteristics of the container. When there is no secondary containment around a container, however, good engineering practice should indicate a more stringent integrity testing schedule than would be required for a container if secondary containment were in place. Although the 2002 revised SPCC rule does not incorporate specific inspection frequency, certain industry standards require more frequent and/or more intensive inspection of containers when they do not have secondary containment.[3]

The EPA inspector should verify that the Plan describes the integrity testing of bulk storage containers, in particular for those containers for which secondary containment is impracticable. The inspector should also review testing records to ensure that the inspection program is implemented as described.

4.5.2 Periodic Integrity and Leak Testing of the Valves and Piping

When the facility owner or operator determines that secondary containment for bulk storage containers is impracticable, he/she must also perform periodic integrity and leak testing of valves and piping associated with the containers for which secondary containment is impracticable (§112.7(d)). Leak testing determines the liquid tightness of valves and piping and whether they may discharge oil. Leak testing should be performed in accordance with appropriate industry

[3] The Steel Tank Institute's "Standard for the Inspection of Aboveground Storage Tanks," SP001, 3rd Edition, Steel Tank Institute, July 2005 (summarized in Chapter 7 of this document) requires more frequent inspections of tanks that do not have adequate secondary containment.

standards. Chapter 7 provides an overview of integrity and leak testing of valves and piping. As for integrity testing, good engineering practice may suggest a more stringent leak testing schedule than would be required if secondary containment were in place. The PE certifies that the extent of this testing is in accordance with good engineering practice, including consideration of applicable industry standards (§112.3(d)).

The EPA inspector should verify that the Plan describes the integrity and leak testing of valves and piping associated with containers for which secondary containment is impracticable. The inspector should also review testing records to ensure that the testing program is implemented as described.

4.5.3 Oil Spill Contingency Plan and Written Commitment of Resources

Unless he or she has submitted a Facility Response Plan under §112.20, an owner or operator who claims that secondary containment is impracticable must include with the SPCC Plan an oil spill contingency plan following the provisions of 40 CFR part 109 and a written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil that may be harmful (§112.7(d)).

The requirements for the content of contingency plans are given in 40 CFR part 109, Criteria for State, Local, and Regional Oil Removal Contingency Plans. The elements of the contingency plan are outlined in §109.5, and include:

- Definition of the authorities, responsibilities, and duties of all persons, organizations, or agencies that are to be involved or could be involved in planning or directing oil removal operations.
- Establishment of notification procedures for the purpose of early detection and timely notification of an oil discharge.
- Provisions to ensure that full resource capability is known and can be committed during an oil discharge situation.
- Provisions for well-defined and specific actions to be taken after discovery and notification of an oil discharge.
- Specific and well-defined procedures to facilitate recovery of damages and enforcement measures as provided for by state and local statutes and ordinances.

Please refer to the model contingency plan found in Appendix F of this document for an example contingency plan prepared in compliance with the SPCC rule and 40 CFR part 109.

As described in 67 FR 47105, a ‘‘written commitment’’ of manpower, equipment, and materials means either a written contract or other written documentation showing that the owner/operator has made provision for items needed for response purposes. According to 40 CFR 109.5, the commitment includes:

- Identification and inventory of applicable equipment, materials, and supplies that are available locally and regionally;
- An estimate of the equipment, materials, and supplies that would be required to remove the maximum oil discharge to be anticipated;
- Development of agreements and arrangements in advance of an oil discharge for the acquisition of equipment, materials, and supplies to be used in responding to such a discharge;
- Provisions for well-defined and specific actions to be taken after discovery and notification of an oil discharge, including specification of an oil discharge response operating team consisting of trained, prepared, and available operating personnel;
- Predesignation of a properly qualified oil discharge response coordinator who is charged with the responsibility and delegated commensurate authority for directing and coordinating response operations and who knows how to request assistance from federal authorities operating under current national and regional contingency plans;
- A preplanned location for an oil discharge response operations center and a reliable communications system for directing the coordinated overall response actions;
- Provisions for varying degrees of response effort depending on the severity of the oil discharge; and
- Specification of the order of priority in which the various water uses are to be protected where more than one water use may be adversely affected as a result of an oil discharge and where response operations may not be adequate to protect all uses. (67 FR 47105)

For a contingency plan to satisfy the requirements of §112.7(d), facilities must be able to implement the contingency plan. Activation of the contingency plan is contingent upon the discharge of oil being detected. As part of evaluating the adequacy of the contingency plan developed to satisfy requirements of §112.7(d), the EPA inspector should consider the time it takes facility personnel to detect and mitigate a discharge to navigable waters and adjoining shorelines. For example, at an unmanned facility, effective implementation of the contingency plan may involve enhanced discharge detection methods such as more frequent facility visits and inspections, or the use of spill detection equipment.

4.5.4 Role of the EPA Inspector in Reviewing Impracticability Determinations

Like other technical aspects of the SPCC Plan, determinations of impracticability must be reviewed by the PE certifying the Plan in accordance with §112.3(d) to ensure that they are consistent with good engineering practice. The inspector should verify that the Plan has been certified by the PE and that the additional measures specified in §112.7(d) are documented in the Plan, as explained below.

By certifying a Plan, a PE attests that the Plan has been prepared in accordance with good engineering practice, that it meets the requirements of 40 CFR part 112, and that it is adequate for the facility. Thus, if impracticability determinations and the corresponding alternative measures and contingency plan have been reviewed by the certifying PE and are properly documented, they should generally be considered acceptable by regional EPA inspectors. However, if an impracticability determination and/or the additional required measures do not meet the standards of common sense, appear to be at odds with recognized industry standards, do not meet the overall objective of oil spill response/prevention, or appear to be inadequate for the facility, appropriate follow-up action may be warranted. In this case, the EPA inspector should clearly document the concerns (including photographs and drawings of the facility configuration, flow direction, and proximity to navigable waters) to assist RA review and follow-up. This may include requesting additional information from the facility owner or operator to justify the impracticability determination. An owner/operator making a determination of impracticability should have considered all appropriate options for secondary containment, and the documentation presented in support of the impracticability determination should include a discussion of the reasons why the various reasonable options are impracticable.

The example below provides an example of an inadequate impracticability determination. The supporting discussion provided in the example does not provide a sufficient discussion of the reasons why the concrete dike is not practicable. It also fails to address, even in general terms, whether means of secondary containment other than a concrete dike may be practicable (e.g., remote impoundment, drainage systems, or active measures). Finally, the discussion does not provide information on the measures that are provided in lieu of secondary containment and how the facility intends to implement the contingency plan, commit manpower and equipment to respond, and perform the required testing on the bulk storage containers and associated piping and appurtenances. Refer to §112.7(c) and (d) for a list of available secondary containment options as well as the additional measures required in the SPCC Plan when a determination of impracticability is made.

Bad Example: Bulk Storage Containers

Bulk Storage Tanks – 40 CFR 112.8(c)(2)

XYZ Oil has determined that secondary containment is impracticable for the two bulk storage tanks located to the east of the maintenance building. There is not sufficient space to build a concrete dike because of the proximity to the property line. XYZ Oil is therefore implementing a contingency plan for this portion of the facility.

For comparison, the following example provides an adequate impracticability determination. The supporting discussion provided in the example clearly explains why various methods of secondary containment measures are not practicable, and documents the measures that the facility has implemented in lieu of secondary containment.

Good Example: Bulk Storage Containers

Bulk Storage Tanks – 40 CFR 112.8(c)(2)

XYZ Oil has determined that secondary containment is impracticable for the two bulk storage tanks located to the east of the maintenance building. There is not sufficient space to accommodate a dike or berm with the required containment capacity due to minimum setbacks and maximum dike height. A dike or berm with the required capacity would either encroach on the neighbor's property and/or exceed a 6-feet safe wall height (OSHA Flammable and combustible liquids regulation, 29 CFR 1910.106). The facility also lacks the space necessary for remote impoundment. Other measures listed under §112.7(c) such as the use of sorbents would not be a reliable and effective means of secondary containment since the volumes involved may exceed the sorbent capacity.

The tanks are currently in good condition and do not need to be replaced. However, tanks of double-wall design may be considered as potential replacement in the future.

Because secondary containment for these two bulk storage tanks is impracticable, XYZ Oil has provided in this SPCC Plan the additional elements required under 40 CFR 112.7(d), namely:

- Periodic integrity testing of bulk storage containers, and periodic integrity and leak testing of valves and piping (see Section 2.7 of the SPCC Plan).
- A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful (see Appendix F of the SPCC Plan).
- An Oil Spill Contingency Plan following the provisions of 40 CFR part 109 (see Appendix G of the SPCC Plan).

In addition to verifying that the SPCC Plan clearly describes the reason why secondary containment measures are not practicable and documents the implementation of the additional measures required in §112.7(d), the EPA inspector should verify that:

- The facility's contingency plan can be implemented as written;
- The equipment for response is available;
- The commitment of manpower, equipment, and materials is documented;
- The contingency plan describes the location of drainage systems, containment deployment locations, and oil collection areas (including recovered oil storage capability);
- There are procedures for early detection of oil discharges; and
- There is a defined set of response actions.

Figure 4-10 provides a checklist an EPA inspector can review to verify that all the criteria of §109.5 are included in a facility's oil spill contingency plan. The EPA inspector may also refer to the checklist included in Figure 4-11 at the end of this chapter when identifying and reviewing technical rule requirements that are eligible for the impracticability provision.

Figure 4-10. Checklist of required components of state, local, and regional oil removal contingency plans. Please refer to the complete text of 40 CFR §109.5.

109.5–Development and implementation criteria for state, local, and regional oil removal contingency plans*		**Yes**	**No**
Definition of the authorities, responsibilities and duties of all persons, organizations or agencies which are to be involved in planning or directing oil removal operations.			
Establishment of notification procedures for the purpose of early detection and timely notification of an oil discharge including:			
(1)	The identification of critical water use areas to facilitate the reporting of and response to oil discharges.		
(2)	A current list of names, telephone numbers and addresses of the responsible persons (with alternates) and organizations to be notified when an oil discharge is discovered.		
(3)	Provisions for access to a reliable communications system for timely notification of an oil discharge, and the capability of interconnection with the communications systems established under related oil removal contingency plans, particularly State and National plans (e.g., NCP).		
(4)	An established, prearranged procedure for requesting assistance during a major disaster or when the situation exceeds the response capability of the State, local or regional authority.		
Provisions to assure that full resource capability is known and can be committed during an oil discharge situation including:			
(5)	The identification and inventory of applicable equipment, materials and supplies which are available locally and regionally.		
(6)	An estimate of the equipment, materials and supplies which would be required to remove the maximum oil discharge to be anticipated.		
(7)	Development of agreements and arrangements in advance of an oil discharge for the acquisition of equipment, materials and supplies to be used in responding to such a discharge.		
Provisions for well defined and specific actions to be taken after discovery and notification of an oil discharge including:			
(8)	Specification of an oil discharge response operating team consisting of trained, prepared and available operating personnel.		
(9)	Predesignation of a properly qualified oil discharge response coordinator who is charged with the responsibility and delegated commensurate authority for directing and coordinating response operations and who knows how to request assistance from Federal authorities operating under existing national and regional contingency plans.		
(10)	A preplanned location for an oil discharge response operations center and a reliable communications system for directing the coordinated overall response operations.		
(11)	Provisions for varying degrees of response effort depending on the severity of the oil discharge.		
(12)	Specification of the order of priority in which the various water uses are to be protected where more than one water use may be adversely affected as a result of an oil discharge and where response operations may not be adequate to protect all uses.		
Specific and well defined procedures to facilitate recovery of damages and enforcement measures as provided for by State and local statutes and ordinances.			

* The contingency plan should be consistent with all applicable state and local plans, Area Contingency Plans, and the National Contingency Plan (NCP).

Figure 4-11. Checklist of SPCC requirements eligible for impracticability determinations.

Rule Element	Relevant Section(s)	Evaluation	Verification	Nonconformance
ALL FACILITIES				
General Containment	112.7(c)	Are appropriate containment and/or diversionary structures provided? Is the containment system capable of containing oil and constructed so that any discharge from the primary containment system will not escape before cleanup occurs?	Visual.	Does the Plan explain why secondary containment is impracticable? Is a Contingency Plan (or FRP) provided? Does the Plan include a written commitment of manpower, equipment, and materials? Does the facility conduct periodic integrity testing of bulk storage containers and integrity and leak testing of associated valves and piping?
Loading/unloading Racks	112.7(h)(1)	Does the loading/unloading rack area drainage flow into a catchment basin or treatment facility? If not, is a quick drainage system used? Is the secondary containment system sized to contain the maximum capacity of any single compartment of a tank car or tank truck loaded there?	Visual.	Does the Plan explain why secondary containment is impracticable? Is a Contingency Plan (or FRP) provided? Does the Plan include a written commitment of manpower, equipment, and materials?
ALL FACILITIES, EXCEPT OIL PRODUCTION				
Bulk Storage Containers	112.8(c)(2) OR 112.12(c)(2)	Is the secondary containment system sized to contain the entire capacity of the largest single container and sufficient freeboard to contain precipitation? Are dikes sufficiently impervious to contain oil?	Visual.	Does the Plan explain why secondary containment is impracticable? Is a Contingency Plan (or FRP) provided? Does the Plan include a written commitment of manpower, equipment, and materials? Does the facility conduct periodic integrity testing of bulk storage containers and integrity and leak testing of associated valves and piping?
	112.8(c)(11) OR 112.12(c)(11)	Are mobile or portable oil containers located within a dike, catchment basin or other means of secondary containment large enough to contain the largest single container and sufficient freeboard to contain precipitation?	Visual.	Does the Plan explain why secondary containment is impracticable? Is a Contingency Plan (or FRP) provided? Does the Plan include a written commitment of manpower, equipment, and materials? Does the facility conduct periodic integrity testing of bulk storage containers and integrity and leak testing of associated valves and piping?

Rule Element	Relevant Section(s)	Evaluation	Verification	Nonconformance
ONSHORE OIL PRODUCTION FACILITIES				
Drainage	112.9(c)(2)	Is drainage from undiked areas safely confined in a catchment basin or holding pond?	Visual.	Does the Plan explain why secondary containment is impracticable? Is a Contingency Plan (or FRP) provided? Does the Plan include a written commitment of manpower, equipment, and materials? Does the facility conduct periodic integrity testing of bulk storage containers and integrity and leak testing of associated valves and piping?
Bulk Storage Containers	112.9(c)(2)	Are all tank battery, separation, and treatment facility installations provided with secondary containment that can contain the largest single container and sufficient freeboard to contain precipitation?	Visual.	Does the Plan explain why secondary containment is impracticable? Is a Contingency Plan (or FRP) provided? Does the Plan include a written commitment of manpower, equipment, and materials? Does the facility conduct periodic integrity testing of bulk storage containers and integrity and leak testing of associated valves and piping?
ONSHORE OIL DRILLING AND WORKOVER FACILITIES				
Drainage	112.10(c)	Are catchment basins or diversion structures provided to intercept and contain discharges of fuel, crude oil, or oily drilling fluids?	Visual.	Does the Plan explain why secondary containment is impracticable? Is a Contingency Plan (or FRP) provided? Does the Plan include a written commitment of manpower, equipment, and materials? Does the facility conduct periodic integrity testing of bulk storage containers and integrity and leak testing of associated valves and piping?