



# New Pig Energy

## SPCC for Oil & Gas

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# SPCC Background

- It is part of the Clean Water Act's Oil Pollution Prevention Regulations (40 CFR 112)
- First codified on December 11, 1973, and took effect on January 10, 1974
  - Amendments in 2002, 2006 and 2008
    - A clarification that containers 55 gallons and larger count toward maximum oil storage capacity
    - Exemptions for operational equipment and tank trucks
    - Tiering and templates for smaller facilities
    - Revised definition of “facility”
    - Clarifies general secondary containment requirements
- Non-delegable to other agencies
  - Some states and localities have oil spill prevention programs



# What is the SPCC Rule?

- Spill Prevention, Control, and Countermeasure Rule
- Includes requirements for Facility Response Plans (FRPs) for certain facilities which may pose a substantial harm to waterways and the environment
- Purpose – To develop plans designed to prevent oil discharges from reaching the navigable waters of the U.S. or adjoining shorelines



# Requirements of the SPCC Rule

- Requires certain facilities, including production facilities, to develop and implement a **site-specific SPCC Plan** to address:
  - Containment and procedures to *Prevent* oil discharges;
  - Proactive *Control* measures to keep an oil discharge from entering navigable waters of the U.S. or adjoining shorelines (containment); and
  - Effective *Countermeasures* to contain, clean up, and mitigate any oil discharge that affects navigable waters of the U.S. or adjoining shorelines (spill response measures).



# Compliance Dates

A facility, including a mobile or portable facility, starting operation...	Must...
On or before August 16, 2002	<ul style="list-style-type: none"><li>• Maintain its existing SPCC Plan</li><li>• Amend and implement the amended SPCC Plan no later than November 10, 2011</li></ul>
After August 16, 2002 through November 10, 2011	<ul style="list-style-type: none"><li>• Prepare and implement an SPCC Plan no later than November 10, 2011</li></ul>
After November 10, 2011 (excluding production facilities)	<ul style="list-style-type: none"><li>• Prepare and implement an SPCC Plan before beginning operations</li></ul>
After November 10, 2011 (production facilities)	<ul style="list-style-type: none"><li>• Prepare and implement an SPCC Plan within six months after beginning operations.</li></ul>



# Applicability

- “Owners and operators of non-transportation related facilities that **drill, produce, gather, store, use, process, refine, transfer, distribute or consume oil and oil products**”
  - SPCC-exempted transportation facilities include:
    - Interstate and intrastate onshore and offshore pipeline systems
    - Highway vehicles and rail cars used to transport oil in commerce
- Anyone with an aboveground storage capacity greater than **1,320 gallons** (from containers of 55 gallons or more) or underground capacity greater than 42,000 gallons
- Anyone who could **“reasonably be expected to discharge oil into navigable waters of the US or adjoining shorelines”** (regardless of the quantity of oil stored)



# Applicability

- Owner/operator makes the initial decision on applicability of SPCC regulations to the facility
  - Does the facility meet the applicability criteria (volumes of oil, expectation to spill to waterway)?
- No requirement to submit SPCC Plan to EPA for approval
- EPA does not formally “approve” or disapprove of SPCC Plan
- Plan is required upon inspection during regular workday
- Unmanned facilities may keep plan at field office



# Applicability

**Counted**



Intermediate Bulk Containers  
(IBCs)/totes often found in  
the Oil Patch at frack jobs

**Not Counted**





# Definition of “Oil”

- Oil of any kind or in any form, including (but not limited to): fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and other **oils and greases, including petroleum, fuel oil, sludge synthetic oils, mineral oils, oil refuse, or oil mixed with waste other than dredged spoil**. § 112.2
- This definition clarifies that the Oil SPCC rules are not limited to petroleum-based oil products. **The definition also includes natural gas drip or condensate, synthetic, hydraulic, lubricating, and mineral oils.**





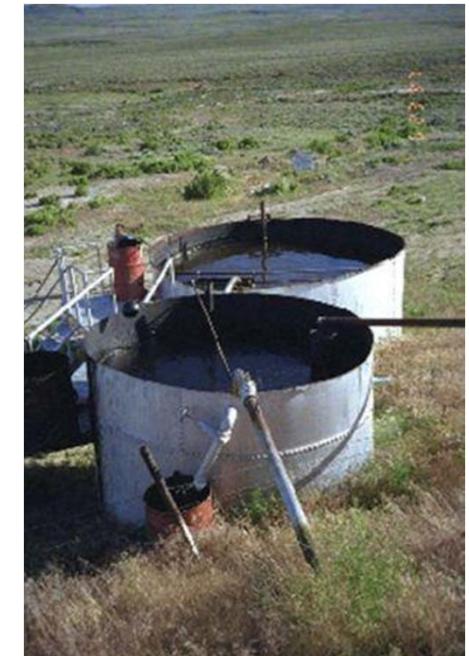
# Definition of “Oil”

- Not included within the SPCC definition of “oil”:
  - Natural gas
  - Highly volatile liquids that volatize on contact with air or water (e.g. liquid natural gas, liquefied petroleum gas)
- Do not count these when calculating the facility’s oil storage capacity



# Examples of Oil at Production, Drilling and Workover

- Produced water containing oil
- Crude oil
- Oily waste
- Fuel for drill rig
- Hydraulic oils
- Waste oils





# Examples of Oil at Production, Drilling and Workover



- Fuel storage for vehicles
- Lubrication oils (pumpjack)
- Oil in transformers
- Liquid oil condensate
- Natural Gasoline
- Oil based “slick water” additives
- On-board lube and hydraulic oils associated with fracturing pumps
- Generators (Gen Sets) at hydraulic fracturing jobs (onboard, lighting or stand alone)
- Distillate for fueling diesel and turbine engines for fracturing pumps



# Generator Sets at production and explorations operations



What is this?? Where is the oil??

This is one of the common questions  
from the SPCC FRP Oil Hotline



# Threshold Determination

- EPA declines to enumerate a specific distance to navigable waters from which a facility must be located for purposes of determining SPCC applicability. 67 Fed. Reg. at 47060.
- Under both EPA's Part 110 rules and the Clean Water Act, if a harmful quantity (violates applicable water quality standards, leaves a sheen, or causes a sludge) of oil reaches navigable waters, adjoining shorelines, or protected resources, a statutory violation has occurred. CWA § 311(b)(4) as defined in § 110.3.



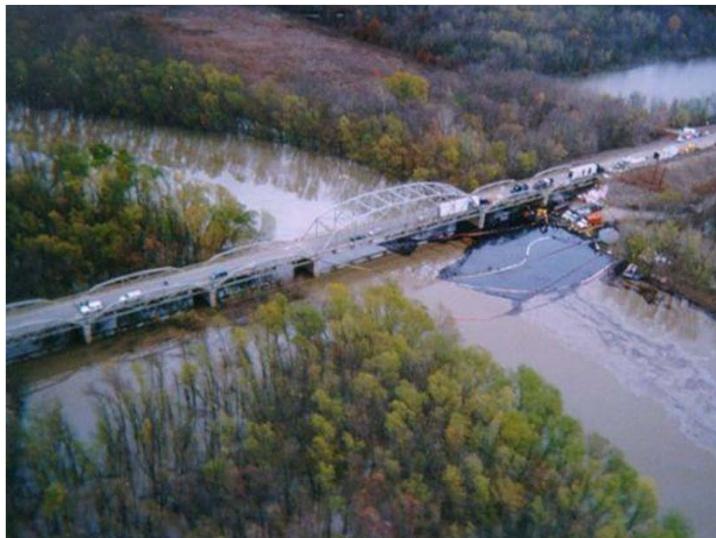
# Navigable Waterways of the U.S. and Adjoining Shorelines

- What are navigable waters of the U.S.? In general:
  - Surface waterways – streams, creeks, rivers, lakes
  - Wetlands adjacent to a navigable waterway
  - Can be intermittent streams. Best determination if flowing at least seasonally (3 months or more), depending on several factors (see Rapanos Guidance)  
[http://www.epa.gov/owow\\_keep/wetlands/guidance/CWAwaters.html](http://www.epa.gov/owow_keep/wetlands/guidance/CWAwaters.html)
  - Defined flow pathway to clearly navigable waters of the U.S. good start in determination – don't assume
  - EPA has developed draft guidance on navigable waters of the U.S and adjoining shorelines.

<http://water.epa.gov/lawsregs/guidance/wetlands/CWAwaters.cfm>



# Navigable Waters of the U.S. and Adjoining Shorelines





# What is a “Reasonable Expectation of an Oil Discharge”?

- Initial determination by the owner/operator based on geographical and location aspects of the production facility
- You may consider proximity to water, land contour, drainage
- Exclude manmade features, such as secondary containment dikes around tanks and impoundments, in determination
- Good idea to document determination
  - Particularly if you conclude you are not subject to the rule
  - Not a rule requirement
- See Section 2.4 of SPCC guidance document

[http://www.epa.gov/emergencies/docs/oil/spcc/guidance/2\\_Applicability.pdf](http://www.epa.gov/emergencies/docs/oil/spcc/guidance/2_Applicability.pdf)



# Definition of “Facility”

- “Facility” includes “any mobile or fixed, onshore or offshore building, property, parcel, lease, structure, installation, equipment, pipe, or pipeline (other than a vessel or a public vessel) used in oil well drilling operations, oil production, oil refining, oil storage, oil gathering, oil process, oil transfer, oil distribution, and oil waste treatment, or in which oil is used....” § 112.2
- “The boundaries of a facility depend on several site-specific factors, including but not limited to, the ownership or operation of buildings, structures, and equipment on the same site and the types of activity at the site.” § 112.2
- Who must prepare?
  - The “owner or operator of an onshore or offshore facility” otherwise subject to Part 112 must prepare an SPCC plan. § 112.3



# What the definition means...

- According to EPA guidance, the extent of a “facility” depends on site-specific circumstances:
  - Ownership, management, and operation of the buildings, structures, equipment, installations, pipes, or pipelines on the site;
  - Similarity in functions, operational characteristics, and types of activities occurring at the site;
  - Adjacency; or
  - Shared drainage pathways (e.g., same receiving water bodies).





# Rule Applies To Non-Transportation Related Facilities

- Drilling
- Producing
- Gathering
- Storing
- Processing
- Refining
- Transferring
- Distributing
- Using
- Consuming



# Examples of Non-Transportation Related Facilities

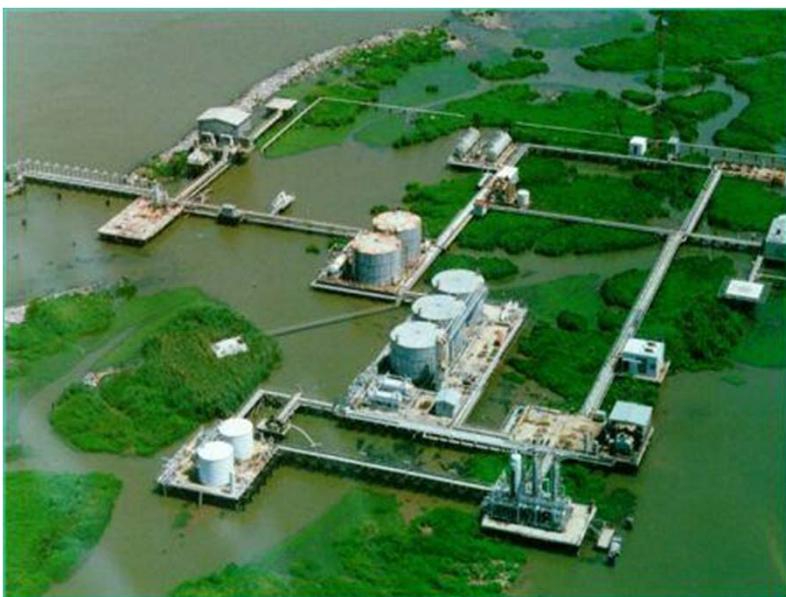


Source: Chesapeake Energy Corporation, 2008

*Hydraulic Fracturing of a Marcellus Shale Well, West Virginia*



# Examples of Non-Transportation Related Facilities



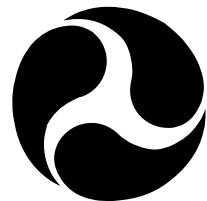


# Examples of Non-Transportation Related Facilities

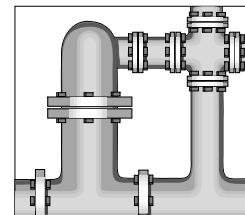
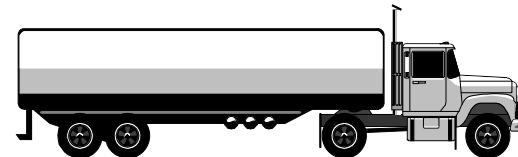
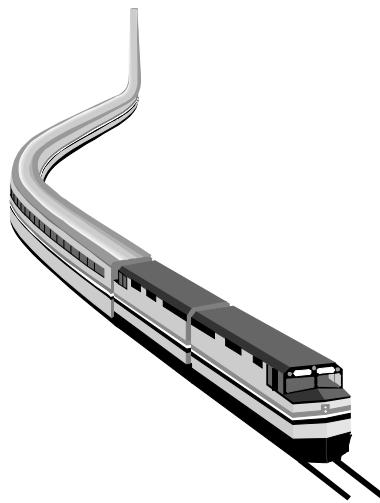




# Examples of Transportation Related Facilities



**DOT - YES!**



**EPA - NO!**





# Examples of Transportation Related Facilities





# Definition of Production Facility

- Revision clarifies that the definition of “production facility” is used to determine which sections of the rule apply at a particular facility (e.g., §112.9).
- Revised definition is consistent with the revision to the definition of “facility”.
- Clarifies the flexibility allowed in determining the boundaries of the facility.
- Clarifies that condensate is regulated.



2001 3 15



# Amended Definition

Production facility means all structures (including but not limited to wells, platforms, or storage facilities), piping (including but not limited to flowlines or intra-facility gathering lines), or equipment (including but not limited to workover equipment, separation equipment, or auxiliary non-transportation-related equipment) used in the production, extraction, recovery, lifting, stabilization, separation or treating of oil (including condensate), or associated storage or measurement, and is located in an oil or gas field, at a facility. This definition governs whether such structures, piping, or equipment are subject to a specific section of this part.





# “Wet Gas” and “Dry Gas” Facilities

- Liquid condensate is an oil.
- A natural gas production facility may store condensate in quantities that meet the applicability criteria for the SPCC.
  - Considered a production facility (§112.9 applies).
  - Called a “wet gas production facility”
- EPA believes that a “dry gas production facility” is not an oil production, oil recovery, or oil recycling facility, as described in the clarification published May 25, 2004 (69 FR 29728)
  - Stores no condensate
  - SPCC requirements do not apply, so long as no other oil is stored at the facility to make it otherwise regulated



# Wet Gas and Condensate Tank





# Produced Water Containers

- The new rule contains exemptions from the tank inspection and secondary containment requirements for certain produced water containers, if a professional engineer certifies the procedures used to minimize oil accumulation in the container.
- Oil/water separators used in oil production and to meet the secondary containment requirements of the rule are not exempt.



# Produced Water Containers

- Produced water container means a storage container at an oil production facility used to store the produced water after initial oil/water separation, and prior to reinjection, beneficial reuse, discharge, or transfer for disposal
- Definition is used to determine which containers are eligible for alternative measures for produced water containers





# Produced Water Containers



Above left: Infrared photograph of a produced water storage tank with a two foot oil layer on top of water.



# Produced Water and Flow Back Water

- OEM is working on policy on “flow back water”
- Flow back water is the fluid that flows out of the well after hydraulic fracturing operations
- Often differentiated by the Total Suspended Solids (TSS) found in the fluid (a function of salinity)
- The flow back water contains both the initial slick additives as well as contaminants from the reservoir
- If the flowback water contains recoverable amounts of oil, you should consider implementing oil spill prevention measures



# What are the SPCC criteria?

You must have an SPCC Plan if:

- Facility stores > **1,320** gallons of **oil** in aggregate above-ground storage or has **42,000** gallons of completely buried oil storage capacity; and
- Facility has a “reasonable expectation of an oil discharge” to waterway or adjoining shoreline.





# Key SPCC General Requirements

- Prepare Plan in accordance with Good Engineering Practices
- Full approval of management to implement Plan and sign off
- Follow sequence of Section 112.7, or use a cross-reference section



# Key SPCC General Requirements

- SPCC regulations requires **preparation and implementation** of a written Plan to address:
  - Operating procedures for routine handling of products to prevent a discharge of oil;
  - Discharge or drainage control measures to prevent a discharge of oil;
  - Countermeasures to contain, clean up, and mitigate an oil spill;
  - Methods of disposal of recovered materials; and
  - Contact list and phone numbers of company, contract response personnel, and National Response Center



# Plans Must Include

- Management approval and commitment of funds
- A contact list
- A diagram of the facility, including drainage
- Trajectory analysis
- Secondary containment or diversion structures
- Contingency plans
- Inspections, tests and records
- Personnel training
- Discharge prevention procedures
- Security
- Loading and offloading procedures
- Brittle fracture evaluations for certain ASTs
- Five-year plan review



# SPCC Plan Formatting

- Facilities are allowed to employ any equivalent alternative SPCC plan (67 Fed. Reg. at 47079-80), such as:
  - A State plan
  - An Integrated Contingency Plan (ICP)
  - A Best Management Practice Plan prepared under a NPDES permit
  - A multi-facility/system-wide plan for operating equipment
- Although the final decision as to what is an “equivalent SPCC plan is within the discretion of EPA Regions, EPA suggests **any format containing all required elements** of an SPCC plan and providing equivalent environmental protection will be **presumptively acceptable**.
- A system-wide plan (e.g. generic spill and contingency plan) with facility/site-specific information readily available through a company’s drawing and equipment databases, supplemented with topographical information, can meet the SPCC plan requirements.



# Professional Engineer (PE)

- Certified by a licensed PE, and attests:
  - Plan is adequate for facility
  - That, if applicable, for a produced water container subject to §112.9(c)(6), any procedure to minimize the amount of free-phase oil is designed:
    - To reduce the accumulation of free-phase oil; and
    - Procedures and frequency for required inspections, maintenance and testing have been established and are described in the Plan



# Professional Engineer (PE)

- Certified by a licensed PE, and attests:
  - PE familiar with 40 CFR Part 112
  - PE or agent visited facility
  - In accordance with good engineering practices
    - Consider applicable industry standards
    - In compliance with regulations
  - Inspection and testing procedures are established
  - State by State issues with SPCC Plan certification





# Failure Analysis



- Where experience indicates reasonable potential for equipment failure
  - Tank loading or unloading equipment
  - Tank overflow, rupture, or leakage
  - Any other equipment known to be a source of a discharge
- Predict for each type:
  - Direction (e.g., north, or to the road)
  - Rate of flow
  - Total quantity of oil that could be discharged



# Self-Certification

- Tier II (Self-Certification)
  - No aggregate above-ground oil storage capacity > 10,000 gallons
  - Has not had a § 112.4 (a) reportable discharge (single discharge over 1,000 gallons within any 12-month period or two discharges exceeding 42 gallons within any 12-month rolling period) in the previous three years or since becoming subject to the SPCC program if less than three years. § 112.6(b); see 71 Fed. Reg. at 77269-75.
  - [http://www.epa.gov/osweroe1/docs/oil/spcc/qualfac\\_fs.pdf](http://www.epa.gov/osweroe1/docs/oil/spcc/qualfac_fs.pdf)
- Tier I (Self-Certification and can use the SPCC Template)
  - Must satisfy Tier II criteria above
  - No individual above-ground oil storage capacity > 5000 gallons
  - <http://www.epa.gov/osweroe1/content/spcc/tier1temp.htm>



# Facility Diagram Requirement

- Revision clarifies that the facility diagram must include all *fixed* (i.e., not mobile or portable) containers.
- For mobile or portable containers, the diagram must:
  - Identify a storage area on the facility diagram (e.g., a drum storage area).
  - Include a separate description of the containers in the storage area in the Plan, or reference facility inventories that can be updated by facility personnel.
  - Provide an estimate of the potential number of containers, types of oil, and anticipated capacities



# Facility Diagram Requirement

## Required elements:

- The location and contents of oil containers (>55 gallons)
- Completely buried tanks and gathering lines otherwise exempt
- Connecting piping
- Transfer stations



## Recommended elements:

- Secondary containment
- Storm drain inlets and surface waters
- Direction of flow in the event of a discharge
- Legend – scale and symbols
- Location of response kits and firefighting equipment
- Location of valves or drainage system controls
- Compass direction
- Topographical information and area maps



# Amendment of SPCC Plan by Owners or Operators

- For changes in facility design, construction, operation, or maintenance that materially affect the potential for a discharge as described in §112.1(b)
  - Commissioning and decommissioning containers
  - Replacement, reconstruction, or movement of containers
  - Reconstruction, replacement, or installation of piping systems
  - Construction or demolition that might alter secondary containment structures
  - Changes in product or service
  - Revision of operating or maintenance procedures
- Amend within 6 months; implement ASAP, but no later than 6 months after amendment



# Plan Review



- Complete review and evaluation of Plan
  - Once every 5 years from the date facility becomes subject to the rule
  - If a facility was in operation on or before 8/16/2002, five years from the date of your last review required by the rule
  - Does not always require a PE
- Amend Plan within 6 months to include more effective prevention and control technology
- Implement ASAP, but no later than 6 months of amendment



# Documenting Plan Review

- Must document Plan review and evaluation
- Sign statement at beginning or end of Plan or in a log or an appendix
  - “I have completed review and evaluation of the SPCC Plan for (name of facility) on (date), and will (will not) amend the Plan as a result.”
- PE must certify any technical amendment to Plan
  - Qualified Facilities exception



# Key SPCC Requirements

- SPCC Plan must be maintained at facility **if manned 4 hours/per day** or more, or at nearest field office **if manned less than 4 hours/per day**
- Usual and customary business practices records serve as documentation of inspection or tests



# Inspections, Tests, and Records

- Conduct inspections and tests in accordance with written procedures developed by the facility or by the engineer who certifies the facility Plan
- Keep these written procedures and a record of the inspections and tests, signed by the appropriate supervisor or inspector, with the SPCC Plan for a period of three years



# Environmental Equivalence

- Allows deviations from **most** technical requirements of the rule when equivalent environmental protection is provided and reasons for non-compliance explained
  - Does not include secondary containment, training, recordkeeping, and administrative provisions of the rule



# Training

- Train oil-handling personnel
  - Operation/maintenance of prevention equipment
  - Discharge procedure protocols
  - Applicable pollution control laws, rules, and regulations
  - General facility operations
  - Contents of the facility SPCC Plan
- Designate person accountable for discharge prevention and who reports to facility management
- Schedule/conduct **at least one** briefing/year:
  - Known discharges and failures, malfunctioning components, new precautionary measures



# SPCC Secondary Containment

Safeguarding method in addition to the primary containment system

## Specific/Sized

- Indoor: Sump capacity should contain 10% of the volume of total containers or the total volume of the largest container, whichever is greater
- Outdoor: Plus sufficient freeboard to contain precipitation

## General

- Address typical failure mode and the most likely quantity
- Passive or Active



# SPCC 40CFR112.7(c)

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.



# Revision to General Secondary Containment Requirement

- Clarified that the general secondary containment requirement is intended to address the *most likely oil discharge* from any part of a facility
- Use of active and passive secondary containment, such as spill kits, allowed

New text: "... In determining the method, design, and capacity for secondary containment, you need only to address the typical failure mode, and the most likely quantity of oil that would be discharged. Secondary containment may be either active or passive in design."

- Modifies §112.7(c) to expand the list of example prevention systems for onshore facilities
  - Additional examples: drip pans, sumps, and collection systems



# Secondary Containment Provisions

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)
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)

*SPCC Guidance for Regional Inspectors*

[http://www.epa.gov/oem/docs/oil/spcc/guidance/4\\_SecondaryContainment\\_Impracticability.pdf](http://www.epa.gov/oem/docs/oil/spcc/guidance/4_SecondaryContainment_Impracticability.pdf)



# SPCC Requirements for Onshore Oil Drilling and Workover Facilities.

## § 112.10 Provision

- If you are the **owner or operator** of an onshore oil drilling and workover facility, you must:
  - (a) Meet the **general requirements** listed under §112.7, and also meet the specific discharge prevention and containment procedures listed under this section.
  - (b) Position or locate mobile drilling or workover equipment so as to prevent a discharge as described in §112.1(b).
  - (c) Provide **catchment basins or diversion structures** to intercept and contain discharges of fuel, crude oil, or oily drilling fluids.
  - (d) Install a blowout prevention (BOP) assembly and well control system before drilling below any casing string or during workover operations. The BOP assembly and well control system must be capable of controlling any well-head pressure that may be encountered while that BOP assembly and well control system are on the well.



# General Secondary Containment

- Applies to the following examples:
  - Christmas tree, wellhead, and stuffing box
  - Oil-filled equipment (transformers, pumpjacks, etc.)
  - Transfer areas
    - Piping runs/racks, manifolds, etc.
    - Flow and intra facility gathering lines
    - Truck loading/unloading areas (not loading rack)
- No specific-sized volume requirement
- Sizing based on typical spill size not container size



# Active Measures

- Can use active measures as secondary containment
- Active measures are those that require deployment or a specific action by an operator
  - These may be deployed either before an activity involving the handling of oil starts, or in reaction to a discharge
- Must be implemented in time to prevent the spilled oil from reaching surface waters
- Active measures may be difficult to implement at an unmanned production facility



# Active Measures

- May be appropriate for discharges that occur during manned activities if they:
  - Can contain the volume and rate of oil
  - Is properly constructed
  - Is deployed in a timely manner
- Examples include:
  - Using spill kits in the event of a discharge
  - Placing a properly designed storm drain cover over a drain prior to a transfer of oil to a container





# Example Methods

Methods	Description of Secondary Containment Examples
Dikes, berms, or retaining walls sufficiently impervious to contain oil	Raised earth embankments or concrete containment walls used in areas with potential for large discharges, such as single or multiple aboveground storage tanks and certain piping.
Curbing	Permanent concrete or asphalt apron surrounded by a curb. Can be used where only small spills are expected and also used to direct spills to drains or catchment areas.
Culverting, gutters, or other drainage systems	Types of permanent drainage systems designed to direct spills to remote containment or treatment areas.
Weirs	Dam-like structures with a notch through which oil may flow to be collected. 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 used to address oil spills that have reached surface waters.
Barriers	Spill mats, storm drain covers, and dams used to block or prevent the flow of oil.
Spill diversion 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.
Sorbent materials	Materials include spill pads, pillows, socks, mats, clay, vermiculite, and diatomaceous earth. Used to isolate and contain small drips or leaks until the source of the leak is repaired.
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.



# Areas Subject General Secondary Containment



Transfer areas subject to the general secondary containment requirement



# Loading/Unloading Areas

- General secondary containment applies (no specific volume required) when there is a loading area
  - Note: loading racks have additional requirements
- You determine amount most likely to be spilled, then provide secondary containment for that volume





# Loading/Unloading Areas





# Specific Secondary Containment Requirements for Production

- Secondary containment sized to the capacity of the largest single container with sufficient freeboard to contain precipitation
- Applies to bulk storage containers at the tank battery, separation and treatment facilities, including, but not limited to:
  - Stock tanks,
  - Produced water containers,\*
  - Separation equipment\*  
(e.g., heater-treaters and separators)
- If facility drainage is used as secondary containment for bulk storage containers, then drainage from undiked areas must be safely confined in a catchment basin or holding ponds

\* The SPCC rule includes alternative measures for certain production equipment in lieu of sized secondary containment



# Specific Secondary Containment

- For Bulk Storage containers at production facilities, sized containment could be an earthen berm, concrete dike or earthen remote impoundment
  - See Chapter 4 of SPCC Guidance Document (Figures 4-5 and 4-6)

[http://www.epa.gov/emergencies/docs/oil/spcc/guidance/4\\_SecondaryContainment\\_Impracticability.pdf](http://www.epa.gov/emergencies/docs/oil/spcc/guidance/4_SecondaryContainment_Impracticability.pdf)

- Sample Calculation Worksheets are also available on the EPA Website (for Qualified Facilities)

<http://www.epa.gov/osweroe1/content/spcc/tier1temp.htm#sec>



# Sufficient Freeboard Capacity Determination

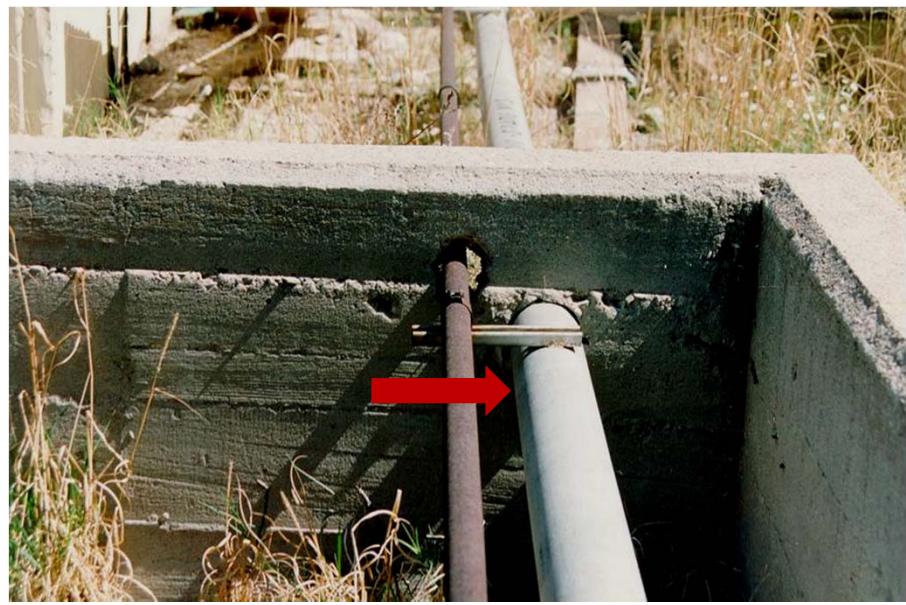
- EPA did not set a standard requirement for freeboard capacity
  - The 25-year, 24-hour storm event was a preamble recommendation based on a RCRA requirement, and is not an SPCC requirement
- Factors to consider
  - Local precipitation conditions (rainfall and/or snowfall)
  - Height of existing dike wall
  - Size of tank/container
  - Safety considerations
  - Frequency of dike drainage and inspection
  - Displacement due to other tanks and/or equipment in the containment area
- The certifying PE determines what is “sufficient freeboard” and should document this determination with supporting calculations in the SPCC Plan





SEP 25 2002







# Overview of Rule Revisions Related to Oil Production Facilities

- EPA streamlined, tailored, and clarified requirements for oil production facilities including:
  - Definition of Production Facility
  - SPCC Plan Preparation and Implementation Timeframe
  - Flowlines and Intra-facility Gathering Lines
  - Flow-through Process Vessels
  - Produced Water Containers
  - Oil and Natural Gas Pipeline Facilities
  - Definition of “Permanently Closed”





# General Requirements Applicable to ALL Facilities

- Production facilities must meet general requirements under §112.7
  - Except the security requirement (§112.7(g))
  - Except general containment requirement (§112.7(c)) for certain flowlines and gathering lines





# Which rule section applies - §112.8 or §112.9?

- 2008 Amendment Preamble Clarification:
  - Only the infrastructure, containers and equipment **uniquely associated with the production of crude oil** is subject to the specific requirements for a production facility (§112.9).
    - Containers, equipment, and piping containing crude oil used in the production, extraction, recovery, lifting, stabilization, separation or treatment of oil or gas condensate, or their associated storage or measurement are included.
  - All other infrastructure or equipment **that indirectly support crude oil production** must meet the specific bulk storage requirements under §112.8



# API Gas Plant Letter

- On December 10, 2010, EPA provided guidance to API regarding the applicability of the SPCC rule to gas plants and gas compression stations
- Gas plants are generally not considered oil production facilities under the SPCC rule and are therefore subject to the facility specific requirements under 40 CFR part 112.8 rather than 112.9.
- As with gas plants, gas compression stations are not generally considered oil production facilities under the SPCC rule and are therefore subject to the facility specific requirements under 40 CFR part 112.8 rather than 112.9.



## §112.9 SPCC Requirements for Onshore Production Facilities

- Outlines specific requirements (in addition to general requirements in §112.7) for onshore **production** facilities regarding:
  - Facility drainage
  - Bulk storage containers
  - Facility transfer operations, pumping, and facility process





# What does this mean for a gas production facility operator?





# Gas Production and SPCC

- Dry versus wet gas production
  - Production of liquid petroleum condensate may bring the facility under the rule's requirements for oil production
  - If no liquid petroleum condensate is produced the facility may not meet the applicability requirements
  - EPA does not regulate gases under the SPCC rule
- Wet gas facilities may have SPCC regulated
  - Condensate tanks
  - Equipment under pressure that could discharge oil in liquid form (Separators or other related equipment)
  - Other oil storage



# SPCC Plan Preparation and Implementation Timeframe

- A new oil production facility has six months after the start of operations to prepare and implement an SPCC Plan.
  - A new oil production facility is one that becomes operational after November 10, 2010 (offshore or FRP) or November 10, 2011 (onshore).
  - “Start of operations” is indicated by the start of well fluid pumping, transfer via flowlines, separation, treatment or storage of crude oil, or other oil storage in capacities greater than the SPCC applicability threshold.





# SPCC Plan Preparation and Implementation Timeframe

- Oil production facilities are likely to stabilize within six months after the start of operations.
  - Applicable only to oil production facilities due to their unique characteristics of variable and uncertain initial flowrates
- Amendment does ***not*** apply to:
  - An existing production facility in which a new well is drilled—facility owner/operator must amend SPCC Plan within 6 months in accordance with §112.5(a)
  - Drilling or workover activities at a production facility—drilling and workover operations are subject to requirements at §112.3(c)



# Production Facility Drainage

- At tank batteries and separation and treating areas
  - Close and seal at all times drains of dikes (or drains of equivalent measures) where there is a reasonable possibility of a discharge
  - Often dikes areas not equipped with valve and are drained manually by a pump.
- Prior to drainage, must inspect diked area and take action according to §112.8(c)(3)
  - Inspect retained rainwater to ensure it will not be discharged in harmful quantities
  - Supervise open bypass valve, and reseal after drainage is complete
  - Keep adequate records of such events



# Production Facility Drainage

- Remove accumulated oil on the rainwater and return it to storage or dispose of it in legally approved method







# Bulk Storage Containers at Production Facilities

Container compatibility  
(§112.9(c)(1)):

Do not use a container  
for the storage of oil  
unless its material and  
construction are  
compatible with the  
material stored and the  
conditions of storage





# Bulk Storage Containers at Production Facilities

- For all bulk containers in the tank battery, separation and treatment facilities satisfy the sized containment requirement (sized to largest container plus freeboard for precipitation); or
- For process vessel and/or produced water containers, you may meet the alternative compliance requirements
- For oil containers that directly support production operations at a production facility but are not a part of a tank battery, or separation, and treatment equipment, then follow §112.7(c) for secondary containment requirements
- If the bulk container does not support production operations then the §112.8 requirements apply



# Bulk Storage Container Inspections

- Visual Inspection (§112.9(c)(3))
- Periodically and upon a regular schedule visually inspect each container for deterioration and maintenance needs (API 12R1 good reference)
- Include the foundation and support of each container that is on or above the surface of the ground



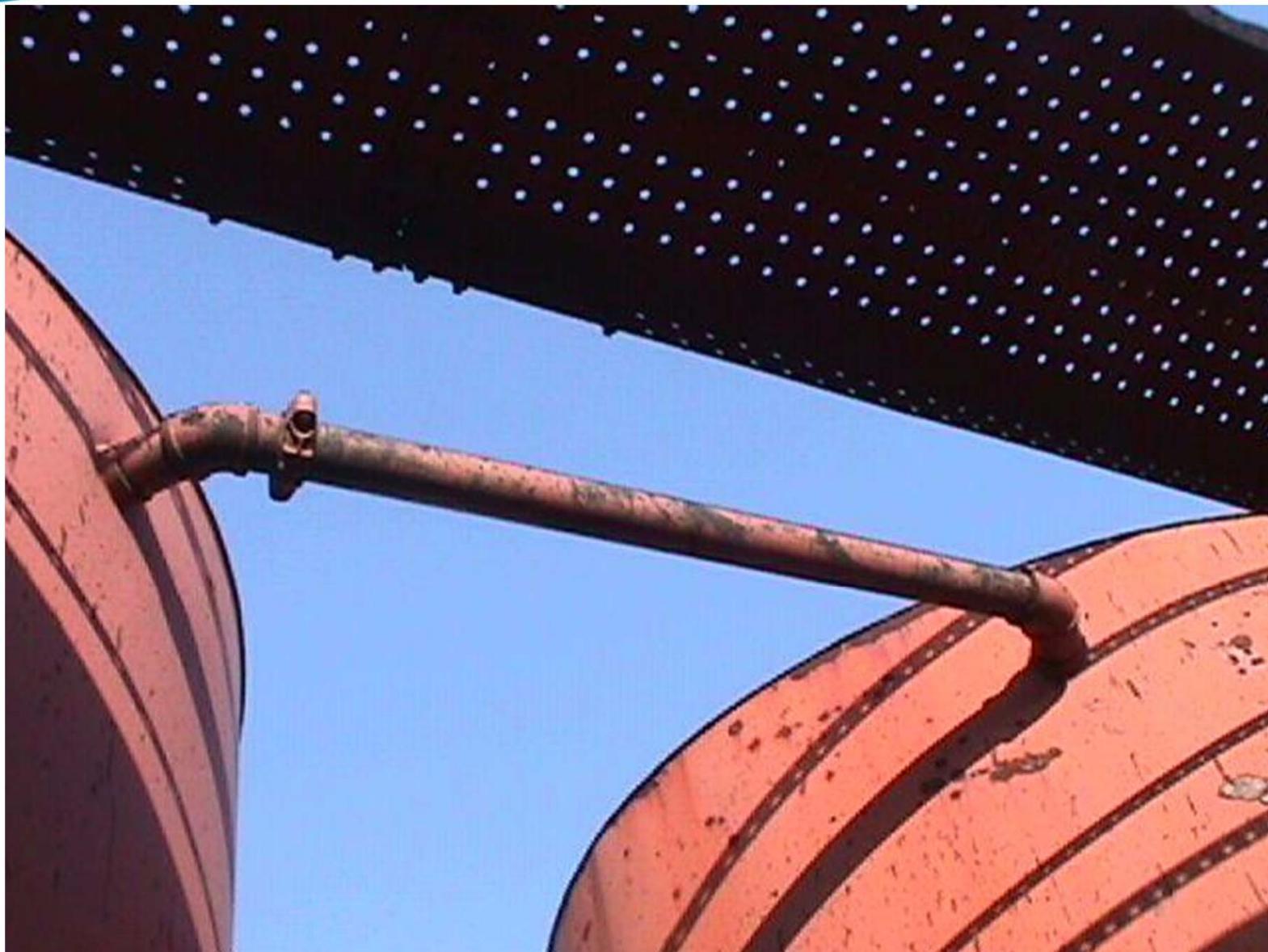


# Bulk Storage Containers at Production Facilities

- Engineer according to good engineering practice to prevent discharges (§112.9(c)(4)), providing at least one of the following:
  - Ensure the container capacity is adequate to prevent overfill if a pumper/gauger is delayed in making regularly schedule rounds
  - Provide overflow equalizing lines between containers so that a full container can overflow to an adjacent container
  - Provide vacuum protection that is adequate to prevent container collapse during a pipeline run or transfers
  - Provide high level sensors to generate and transmit an alarm signal to the computer where the facility is subject to a computer production control system



# Equalizing Line







# Compliance Alternative: Produced Water Containers

- Instead of providing sized secondary containment for produced water containers, a facility owner/operator can:
  - Have a PE certify a procedure for each produced water container that is designed to separate the free-phase oil that accumulates on the surface of the produced water, that is implemented on a regular schedule;
  - Conduct visual inspections, maintenance and corrective action;
- General secondary containment requirements still apply

If the facility discharges to navigable waters or adjoining shorelines:

- 1,000 U.S. gallons of oil in a single discharge, or
- 42 U.S. gallons of oil in each of two discharges within a 12 month period

from a produced water container, then the facility owner/operator may no longer take advantage of this alternative option and must comply with the sized secondary containment requirements at §112.9(c)(2) and inspection requirements at §112.9(c)(3) within six months of the discharge.



# Procedure to Remove Oil from Produced Water Containers

- A procedure designed to remove free-phase oil that accumulates on the surface of the produced water container
  - Implemented on a regular schedule
  - General secondary containment must be able to address the amount of oil in the produced water container
- SPCC Plan must include:
  - Description of the free-phase oil separation and removal;
  - Frequency it is implemented;
  - Amount of free-phase oil expected to be inside the container; and
  - Description of the general secondary containment
- Owner or operator must keep records of the implementation of these procedures in accordance with §112.7(e).



# PE Certification

- PE attests that Plan is prepared in accordance with good engineering practices and includes a provision certifying that:
  - An oil removal procedure for produced water containers is designed to reduce the accumulation of free-phase oil, and
  - The procedures and frequency for required inspections, maintenance and testing have been established and are described in the Plan.



# Flowlines and Intra-facility Gathering Lines

- What is a flowline?
  - Flowlines are piping that transfer crude oil and well fluids from the wellhead to the tank battery **and** from the tank battery to the injection well.
- What is a gathering line?
  - Gathering lines transfer crude oil product between tank batteries, within or between facilities.
  - Any gathering lines within the boundaries of a facility are “intra-facility gathering lines” and within EPA’s SPCC jurisdiction.
  - Gathering lines often originate from an oil production facility’s lease automatic custody transfer (LACT) unit.
- “Flowline” and “gathering line” are not defined in the rule.



# Flowlines and Gathering Lines





# Compliance Alternative: Flowlines

- Secondary containment is often impracticable for flowlines and intra-facility gathering lines
- SPCC rule provides an optional alternative to general secondary containment
- Instead of secondary containment for flowlines and intra-facility gathering lines, rule requires:
  - Implementation of an oil spill contingency plan in accordance with 40 CFR part 109
  - Written commitment of manpower, equipment, and materials to control and remove any quantity of oil discharged that may be harmful
  - Flowline/intra-facility maintenance program meeting the new rule requirements.
- Secondary containment may still be used instead



# Exemption for Certain Gathering Lines

- Gathering lines that are subject to the DOT regulatory requirements at 49 CFR parts 192 or 195 are **exempt** from the SPCC requirements.
  - Exemption is for intra-facility gathering lines present at a facility where the piping is subject to both EPA and DOT jurisdiction and regulations.



# Flow and Intra-Facility Gathering Line Maintenance Program

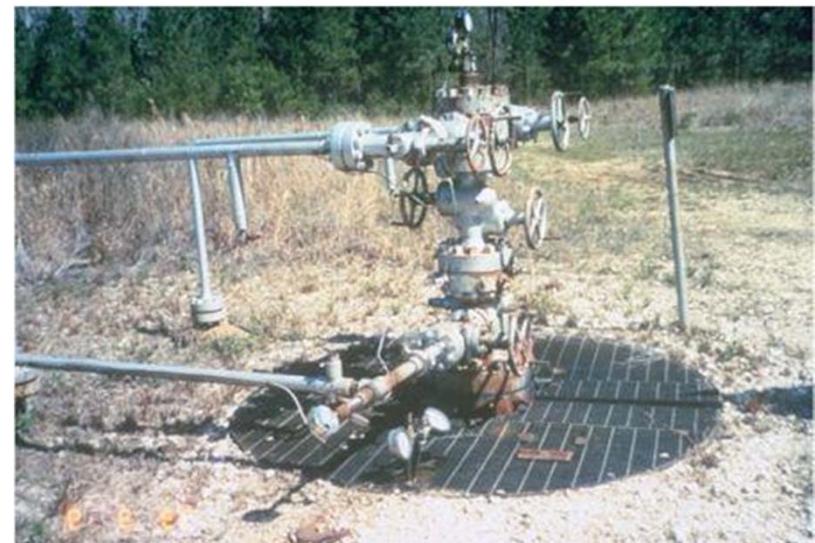
The maintenance program must address procedures to:

- 1) Ensure compatibility with the type of production fluids, their potential corrosivity, volume, and pressure, and other conditions expected in the operational environment
- 2) Visually inspect and/or test on a periodic and regular schedule for leaks, oil discharges, corrosion, or other conditions that could lead to a discharge as described in §112.1(b)
- 3) Take corrective action or make repairs as indicated by regularly scheduled visual inspections, tests, or evidence of a discharge
- 4) Promptly remove or initiate actions to stabilize and remediate any accumulations of oil discharges associated with flowlines, intra-facility gathering lines, and associated appurtenances



# Transfer Operations – Aboveground Valves and Piping

Inspect, periodically and upon a regular schedule, for the general condition of flange joints, valve glands and bodies, drip pans, pipe supports, pumping well polish rod stuffing boxes, bleeder and gauge valves and other such items





# Transfer Operations – Saltwater Disposal Facilities

- Inspect saltwater (oil field brine) disposal facilities often to detect possible system upsets capable of causing discharge
- Particularly following a sudden change in atmospheric temperature





*Source: Chesapeake Energy Corporation, 2008*

*Hydraulic Fracturing of a Marcellus Shale Well, West Virginia*

# **ONSHORE DRILLING AND WORKOVER REQUIREMENTS**

## **112.10**



# Drilling and Workover

- Drilling rig's oil tank will typically break the SPCC thresholds
- Does not matter if it oil or gas exploration
- Hydraulic Fracturing operations fall under these specific requirements
- These types of facilities/operations may use mobile (general) type SPCC Plan that travel with the equipment from pad to pad
- Clear delineation of container responsibility under the respective SPCC Plan is critical



# Onshore Drilling and Workover Requirements



- Meet general requirements listed under 40 CFR 112.7, and:
- Position or locate mobile drilling or workover equipment so as to prevent a discharge

*§112.10(b)*



# Onshore Drilling and Workover Requirements

- Provide catchment basins, reserve pits, or diversion structures to contain any spill of oil or oily fluids (drilling mud)



§112.10(c)



# Onshore Drilling and Workover

- No specific sizing requirement, and no freeboard requirement for secondary containment
- This includes:
  - Fuel tanks for drill rigs and other work over equipment including fuel for fracturing pumps
  - Oil and hydraulic tanks associated with fracturing pumps
  - Gen sets
  - Other oil storage (IBCs, totes and drums)

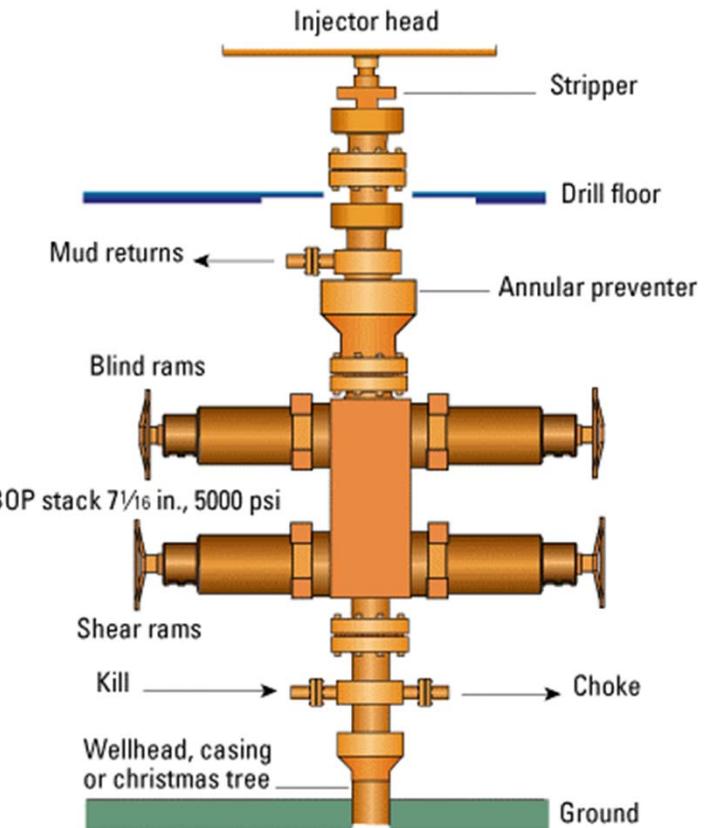


*§112.10(c)*



# Onshore Drilling and Workover

- Install a Blow Out Prevention (BOP) assembly and well control system
- The BOP assembly and well control system must be capable of controlling any well-head pressure that may be encountered



§112.10(d)



# SPCC Implications

- Fracturing operations typically occur as a part of the drilling/workover process
- These operations require the use and storage of refined petroleum products
  - Lubricant oils and fuels for fracturing equipment
  - Fracturing additives (petroleum (oil) based friction reducers)
  - Fuels and oils for other equipment Turbine pumps
- EPA is developing policy on this equipment and how it is regulated under the SPCC rule
- Production workgroup developing a Q &A document
  - Some guiding principals
  - If in doubt consult you SPCC coordinator or HQ Rep

**What kind of oil containers are on site which may be SPCC regulated?**

Oil and hydraulic oils used for pumps in the fracturing process

**Typical window for a hydraulic fracturing job can be short**

Fuel tanks for the diesel and turbine pumps used in the fracturing process

Generator Fuel Tanks

Misc. Oil Storage (oil based additives) Friction Reducers? IBC  
Tote Storage

Frac Tanks Storing Oil

Fuel tanks for vehicles are exempt under the motive power exemption

Trailers left on site to store oil or refuelers dedicated to the site

Source: Chesapeake Energy Corporation, 2008

Hydraulic Fracturing of a Marcellus Shale Well, West Virginia



# IBCs for chemical storage (which may contain petroleum)





# Proppant Equipment



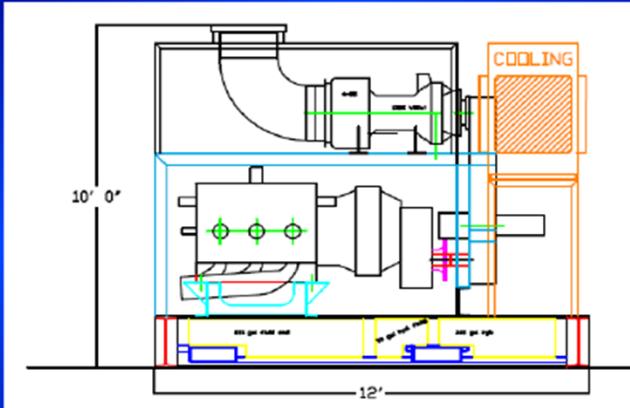


# Hydraulic Fracturing Trailer Mounted Pumps

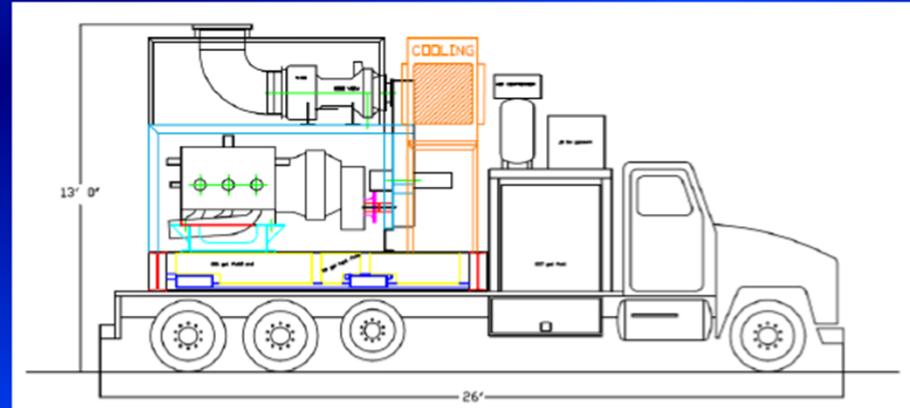


Pumps driven by diesel reciprocating engines or split-shaft turbine engine each with onboard diesel fuel storage up to 3,000 gallons

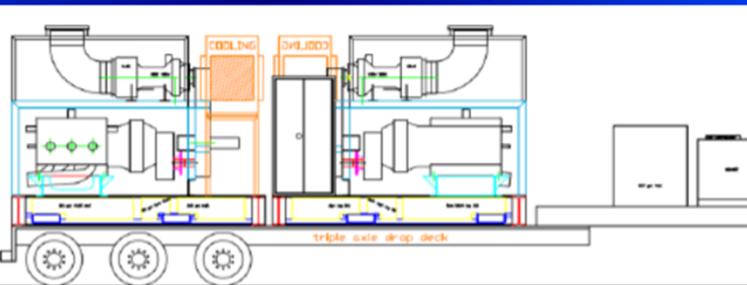
**Plug & Play Spare. Offshore Transport - 23,000 lbs**



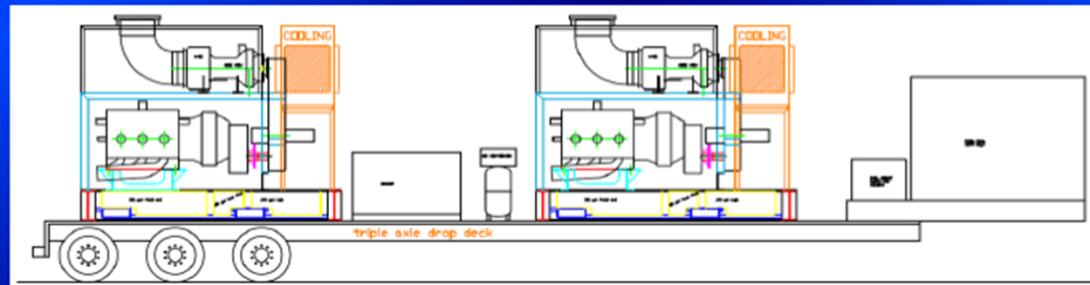
**Bobtail Frac for Marcellus Shale and Tight Access Sites. 26 Foot Frac Unit**



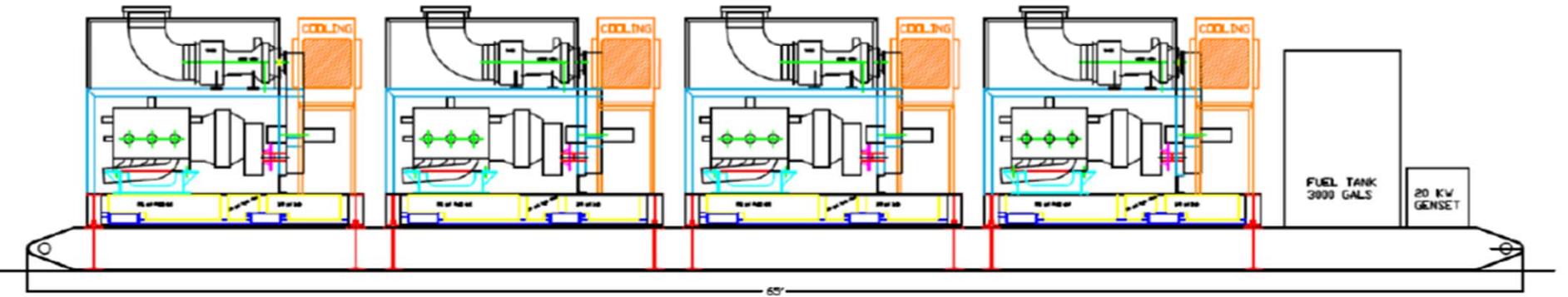
**35 Foot Double Frac with Fuel Storage and 25 KW Gen**



**48 Foot Double Frac with 3,000+ Gal Fuel, 25 KW Gen and Frac Support Accessories**



**65 Foot Quad Frac Skid Designed for Semi-Permanent Walking Rigs. All Frac Units Run on #2 Diesel, CNG, LNG, Field Gas & Bio-Fuel**





# Other Oil Storage

Water pumps

Fuel trucks

Generator Sets

Lighting

Power





# Questions?

