RCRA Organic Air Emission Standards Overview

A brief summary of Subparts AA, BB and CC Standards for RCRA permitted, interim status, and generator facilities.

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Applicability: Who is Covered?

- Facilities subject to *40 CFR §270:*
  - *Permitted*
  - *Interim status,*
- Hazardous waste recycling units located at 90-day facilities, provided another unit at the facility has to obtain a RCRA permit (previously exempt),
- Large Quantity Generator (LQG) 90-day tanks and containers.

[*40 CFR §264.1030(b)(1-3)*]

RCRA Organic Air Emissions Standards: What is subject to the Standards?

Hazardous Waste Management Units (HWMUs) and associated equipment that managing organic hazardous waste streams:

- Subpart AA: Process vents at Treatment, Storage & Disposal Facilities (TSDFs) and LQGs.
- Subpart BB: Equipment leaks at TSDFs and LQGs.
- Subpart CC: Tanks, Surface Impoundments, Containers & Miscellaneous Units at TSDFs and,
  - LQG containers and tank systems (i.e., 90-day units).
- Recycling Units are potentially subject to Subparts AA, BB and CC at LQGs or TSDFs.

Why the Standards were/are Needed

The Standards were designed to address 3 Major Emission Issues:

- Odor,
- Ozone precursors,
- Air toxic pollutants which include many carcinogens found to impact populated areas of the Country.

The Standards were development under RCRA Section 3004(n)

- Phase I (Subparts AA and BB)
  - *Process Vents and Equipment Leaks (55 FR 25494, June 21, 1990).*
- Phase II (Subpart CC)
  - *Tanks, surface impoundments, containers, miscellaneous units (59 FR 62927, December 6, 1994).*

The Standards are effective for all existing, interim status and permitted hazardous waste handling facilities in all states.

All hazardous waste handling facilities should be able to demonstrate compliance.

States with RCRA Organic Air Emission Standards Authorization

- **Most states are authorized for the Organic Air Emission Standards and are responsible for applying the Standards and inspecting for Standard compliance.**
- **If the state has not yet adopted and been authorized, the EPA is responsible for applying the Standards and inspecting for Standard compliance.**
  - *Including the issuance of a federal portion of the RCRA Hazardous Waste Management Permit concurrently/jointly with the state to constitute a full RCRA Permit for the facility.*

The Standards Regulated Universe: Facts to Keep in Mind

- Almost every facility that handles organic waste streams is subject to the Standards.
  - *Most commonly Subpart BB and Subpart CC.*
- Exemptions claimed from the Standards are normally not applicable at most of the facilities.
- Application of the Standards are extremely detailed and specific to the unit, equipment and device.

RCRA Organic Air Emissions Standards: What is the Control Approach?

- Application of controls based on organic content of the hazardous waste streams handled and the existence of physical, unit-, equipment- and device-specific emission controls.
- Units that manage waste below threshold levels of organic concentration are exempt from control requirements:
  - Subpart AA – 10 ppmw total organic concentration of waste stream.
  - Subpart BB – equipment contacting waste with total organic concentrations of 10% by weight.
  - Subpart CC – 500 ppmw average volatile organic concentrations at point of origination.

RCRA Organic Air Emission Standards: How is Compliance Demonstrated?

- The Standards intend the facility *demonstrate* compliance *through recordkeeping*.
  - Control choices need to be well documented and the Leak Detection and Repair and inspection records well detailed to clearly show compliance.
  - Employee training should be well documented to show employee expertise in leak detection methods, corrective action, and repair record keeping for Standard compliance.
  - Can be done combined with tank/HWMU inspection and recordkeeping.

The Standards: Quick High Level Overview of Each

- The Standards are very detailed and cover a significant number of pieces of equipment, a number of HWMUs and emissions control devices specifically.
- To train front line level staff that will apply and inspect for compliance, requires a more intense 3- to 5-day course and hands-on experience investigating and understanding system components at the regulated facilities.
- This Webinar presentation is designed to only introduce the Standards and open discussion with the states as to which areas of the Standards need to be targeted for future training efforts.

The remainder of this presentation will brief you on the general requirements of each Standard.

Subpart AA: Process Vents
What vents are subject to comply?

- Applicable to certain TSD and LQG process vents associated with:
  - Distillation
  - Fractionation
  - Thin-film evaporation
  - Solvent extraction
  - Or air or steam stripping operations

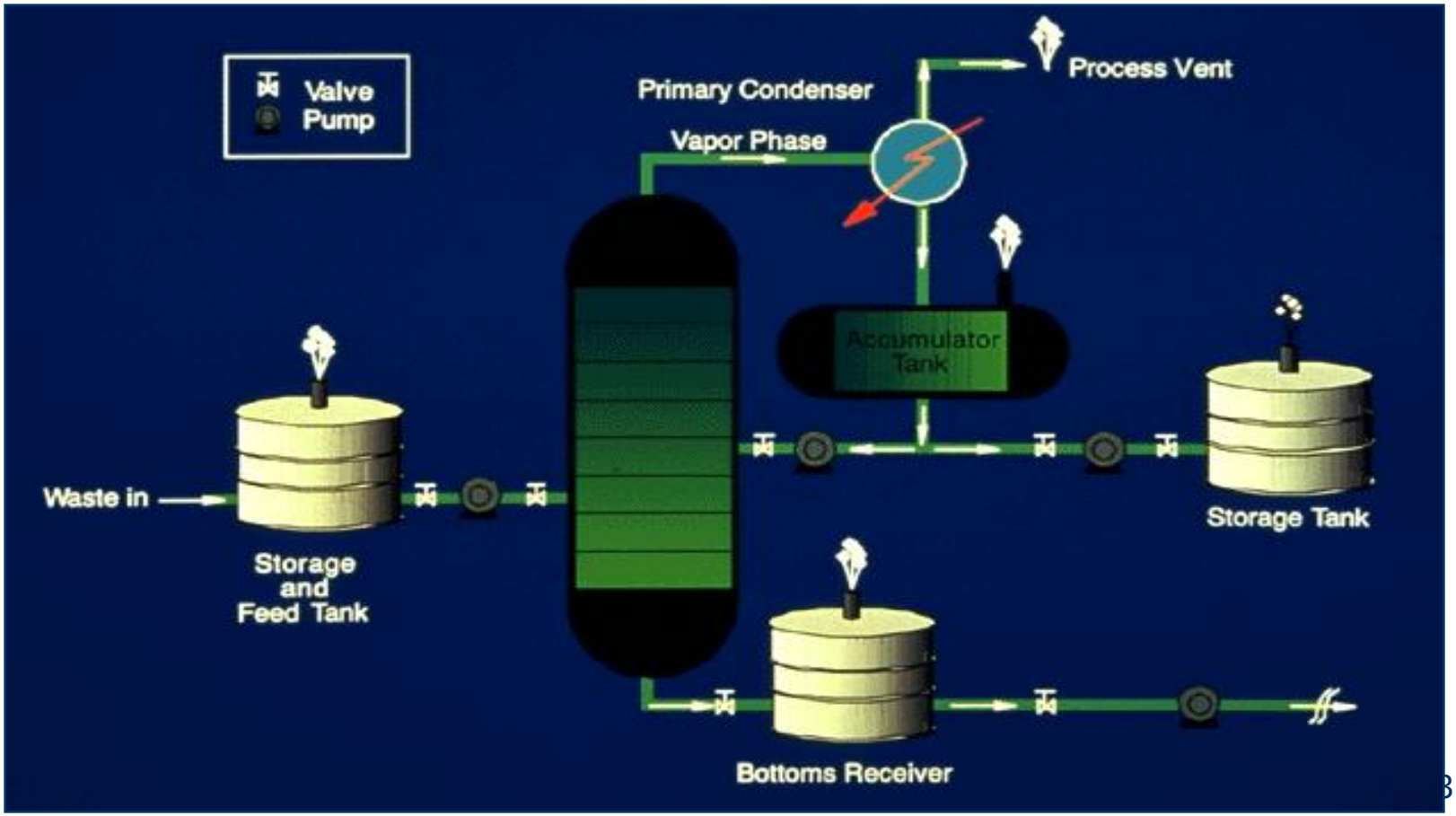
- Units that manage hazardous wastes with **(total) organic concentrations** of at least 10 parts per million by weight (ppmw).

Subpart AA: Process Vent Definition

Process vent:

Any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or a tank associated with hazardous waste distillation, thin-film evaporation, solvent extraction or air or steam stripping.

Process Vent: Applicability



Subpart AA: Emissions Control Requirements

- Reduce total organic emissions from **ALL** affected (i.e., subject units facility wide) process vents <1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 tons/yr) or use of a unit-specific control devices to reduce the total organic emissions from the source (i.e., control device) by 95 percent by weight.

- If the facility chooses to use a control device, Subpart AA specifies closed-vent system and control device performance, monitoring and repair requirements.

- If a closed-vent system to a control device is used, the closed-vent system and control device must be operating at all times when emissions maybe be vented.

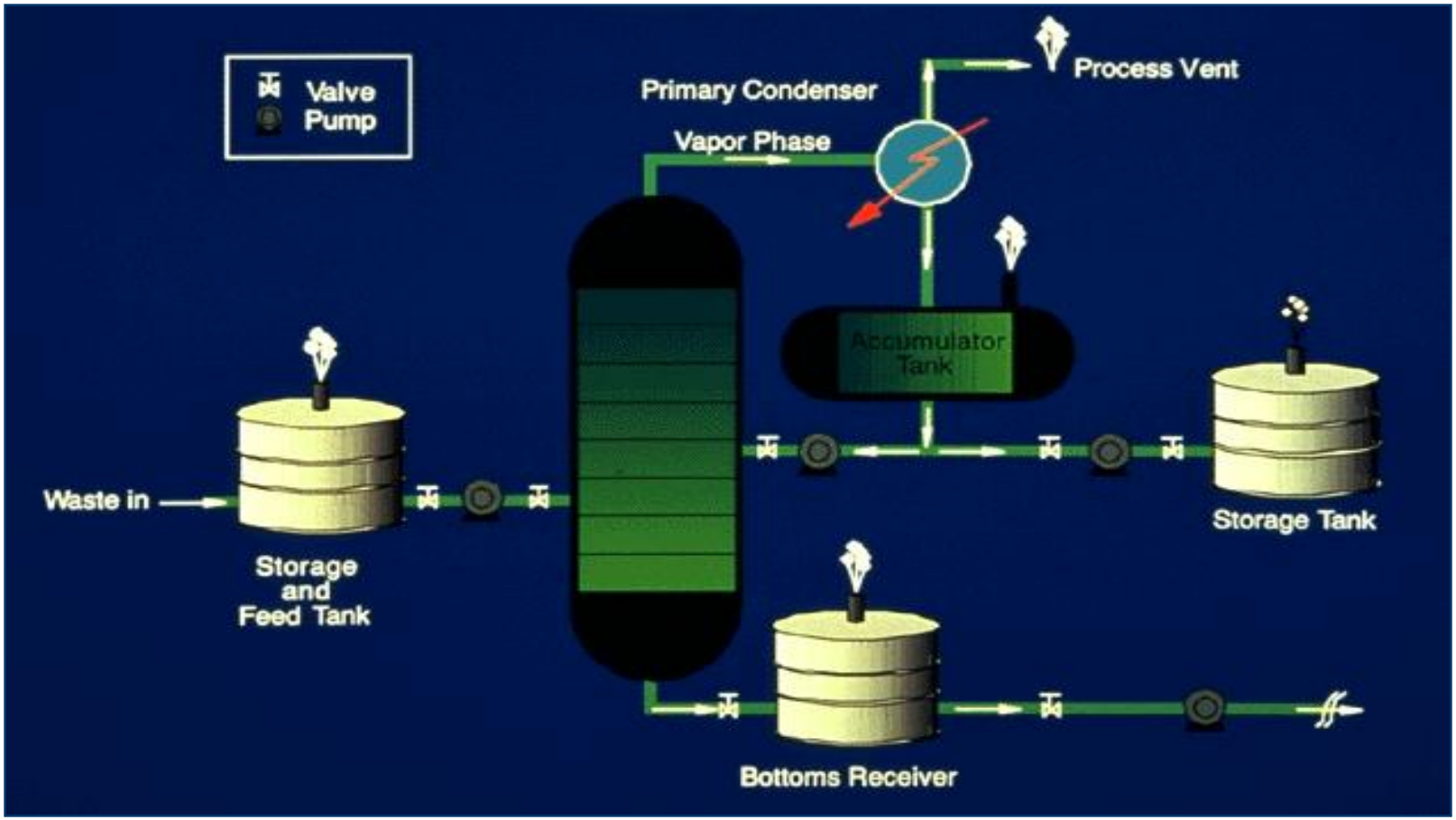
Subpart AA: Inspection & Monitoring

- Each control device must have installed and operating flow indicator that records at least once per hour.
- Each control device must have installed and operating control-device specific monitoring device to continuously monitor control device operation per that specified by the Standard.
- Must inspect monitoring records at least once each operating day.
- If control device inspection indicates a problem, corrective action must be immediately implemented and recorded.
- Closed vent systems must be monitored annually; detectable emissions controlled as soon as practicable, but not later than 15 days.

Subpart AA: Recordkeeping & Reporting

- Record:
  - *Design documentation, repairs, training, monitoring and inspection information.*
- Report:
  - *Must report to agency instances where control device exceeded design specifications for longer than 24 hours.*

Subpart BB: Equipment Standards



Subparts BB Applicability: Who is covered?

- Facilities subject to 40 CFR Part 270.
  - *Permitted*
  - *Interim Status*
- Hazardous waste recycling units located at 90-day facilities, provided another unit at the facility has to obtain a RCRA permit (previously exempt).
- LQG 90-day tanks and containers.

Subpart BB: What equipment is subject?

- Equipment that contacts hazardous waste streams containing at least **10% total organic concentrations by weight**.
- Specific Requirements are detailed for:
  - Pumps
  - Compressors
  - Pressure relief devices
  - Sampling connecting systems
  - Open-ended valves or lines
  - Valves
  - Flanges and other connectors

Subpart BB: Exemptions

- Equipment which contains or contacts hazardous waste < 300 hours per year.
  [264.1064(g)(6), 265.1064(g)(6)]

- Equipment in vacuum service.
  [264.1064(g)(5), 265.1064(g)(5)]

Subpart BB: Pumps in Light Liquid Service

- Monitored monthly to detect leaks,
- Checked weekly for indication of liquids dripping from pump seal,
- Instrument reading of 10,000 ppm or greater indicates a leak,
- Indications of liquids dripping from pump seal indicates a leak.

Subpart BB: Compressors

- Equipped with a seal system with a barrier fluid system,
- Seal system operation and performance requirements are specified in the Standard,
- Barrier fluid must not be a hazardous waste with organic concentration of 10 percent by weight or greater,
- Sensor detected failure of seal system, barrier fluid system, or both = Leak,
- Daily/monthly check of sensor and leak repair requirements.

Subpart BB: Pressure Release Devices in Gas/Vapor Service

- Operated with no detectable emissions (< 500 ppm above background) except during pressure releases,
- Returned to no detectable emissions (to be monitored and confirmed within five days) after each pressure release,
- Repair requirements when a leak is detected.

Subpart BB: Sampling Connections

- Must be equipped with a closed-purge, closed-loop, or closed-vent system;
- In-situ or no-purge sampling systems are exempt;
- Some operational requirements on purge return.

Subpart BB: Open-ended Valves or Lines

- Can’t have open ended lines.
- Must be equipped with cap, blind flange, plug or second valve.
- Operational requirements for second valves and double-block-and-bleed systems are specified by the Standard.

Subpart BB:
Valves in gas/vapor or light liquid service

- Monitored monthly by Method 21
- Leak ≥ 10,000 ppm
- Valve is exempt from monthly if designated to operate with ‘no detectable emissions’ tested annually
- Special requirements for valves unsafe to monitor and difficult to monitor

Subpart BB: Everything Else

- Heavy service pumps and valves, light and heavy liquid service pressure relief devices and flanges and connectors
  - Visual, audible, olfactory or other leak detection monitoring required,
  - Should be monitored concurrent with tank/HWMU inspections for efficiency,
  - Repair requirements 1st attempt within 5 days / repaired within 15 days (next slide)
  - Inaccessible or ceramic/ceramic-lined connectors are exempt.

Subpart BB: Repair Requirements

- Leak must be repaired as soon as practicable, but no later than 15 calendar days after detected.
- First attempt at a repair shall be made no later than 5 calendar days after detected.
- Delays in repair beyond 15 days, must be documented and reported semi-annually.

[264.1059, 265.1059]

Subpart BB: Recordkeeping Requirements

- ***Equipment identification numbers***,
- Associated HWMU identification,
- Location of equipment on the HWMU,
- Type of equipment,
- Waste state and percent-by-weight total organics in waste stream contacting the piece of equipment,
- Control method used to comply with Standard,
- Can be recorded with other similar records for CAA compliance and with RCRA tank, HWMU or container inspection records.

Subpart BB: Recordkeeping for Leaks

- When a leak is detected:
  - Equipment shall be identified with a weatherproof visible ID tag
  - Record shall be entered into inspection log including:
    - Instrument, operator, and equipment identification number
    - Cause and hazardous waste leaking,
    - Dates and method of repair.

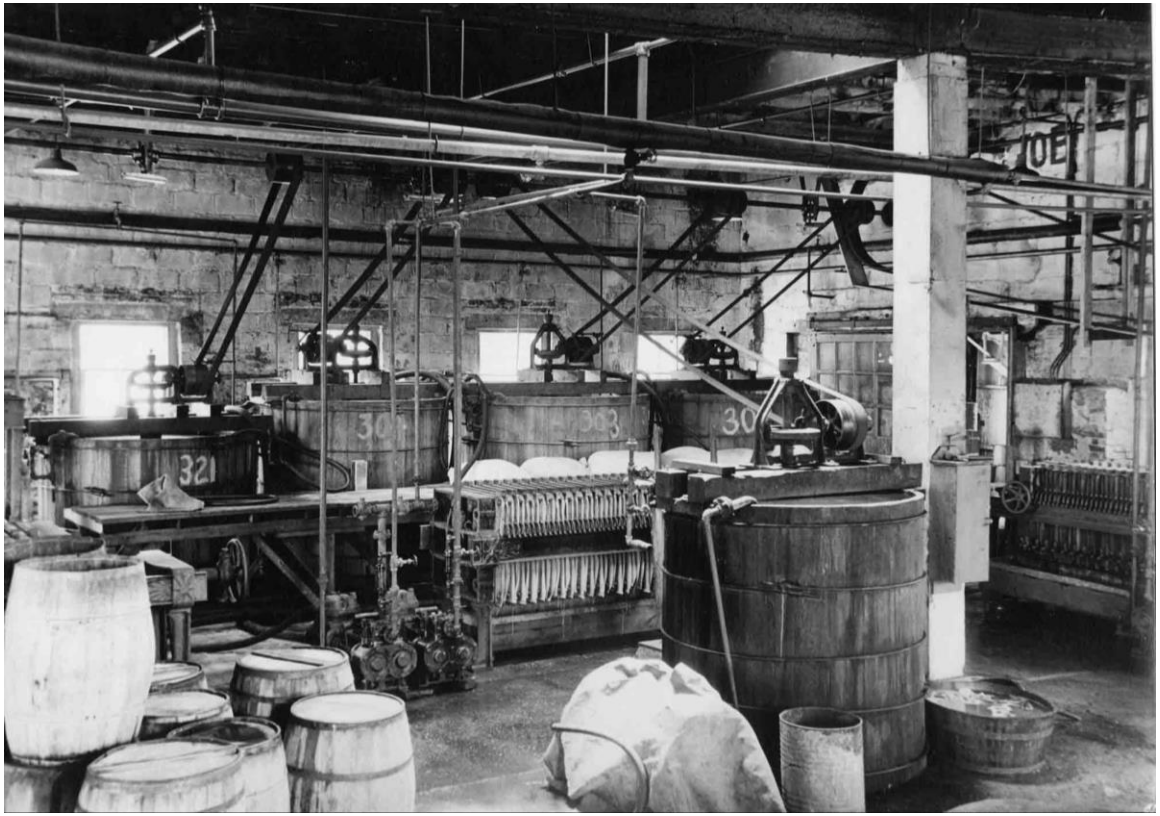
Subpart BB: Reporting Requirements

- Semi-annual report for
  - Valve, pump, or compressor leak not repaired as required,
  - Dates of HWMU shutdowns,
  - Control device exceedance(s),
    - When, what, how long, repair date, cause & repair information
  - Report is not required if no exceedance occurs.

Applicability to Auto Manufacturing

- Auto Manufacturers generate large volumes of hazardous waste purge solvent from painting and coating systems.
- Once solvent has been used to clean spray guns and is discharged, the resulting mixture of purged solvent is hazardous waste.
- Auto Manufacturers' pipes, valves, pumps etc. required to comply with CAA Subpart IIII, are exempt from Subpart BB.

RCRA Subpart CC - Overview



Circa 1935
Chemical Plant
in NJ

Subpart CC Applicability

- Affected units are tanks, containers, surface impoundments, and miscellaneous unit which are:
  - *Subject to permit (Part 264), interim status (Part 265) or less-than 90-day large quantity generator (Part 262) standards, and,*
  - *Not expressly exempted from the Standards.*
- Subpart CC controls are required if the waste has an **average volatile organic (VO)** concentration at the point of waste origination of 500 ppmw or greater

Subpart CC Exclusions

- Wastewater treatment units
- Elementary neutralization units
- Emergency or spill management units
- Totally enclosed treatment facilities
- Hazardous waste recycling units (if no other permitted units at facility)
- Conditionally exempt small quantity generators
- Small quantity generators
- Satellite accumulation units
- Other permitting exemptions
- RCRA empty containers

Units with CAA, NESHAP or NSPS Control

- Subpart CC excludes units which are equipped and operating with air emission control devices required by CAA 40 CFR Part 60, 61 or 63
  - Clean Air Act (CAA)
  - National Emission Standard for Hazardous Air Pollutants (NESHAP)
  - New Source Performance Standard (NSPS)

What is Subpart CC's Volatile Organic (VO) Waste Concentration Criteria?

- Subpart CC requires organic emission controls on affected units, unless the average VO concentration of hazardous waste managed in unit is < 500 ppmw at point of waste origination.

Subpart CC: What is the Point of Waste Origination?

- Owner or operator responsible for ensuring the waste determination is representative of current worst case waste streams.
  - *Repeat when conditions change or when waste stream changes*
  - *Update annually*

- The Point of Origination is where a material or by-product produced by a process, is intended to be discarded (i.e., no longer can be used and is diverted from or separated from the production process).
  - *solid waste produced by the system becomes a hazardous waste as defined by Part 261*

What is considered a Volatile Organic Compound?

- Organic compounds with a Henry's law constant value of at least 0.1 mole-fraction-in-the-gas phase/mole-fraction-in-the liquid-phase at 25 degrees (º) Celsius (C) (40 CFR §265.1081).
- Appendix VI of Subpart CC presents a list of compounds know to have a Henry's law constant values less than the cutoff level.

How is the VO Concentration Determined?

- Testing:
  - *Sample hazardous waste*
  - *Analyze samples using one of seven specified methods or other method validated using specified procedures (Method 25D)*
- Process knowledge:
  - *Application of owner/operator experience using appropriate information*
- VO concentration must be determined for each waste stream.

Process Knowledge

- Provides flexibility to use available information to determine VO concentration of a hazardous waste.
- Information sources can be:
  - Existing information collected for other purposes;
  - New information collected specifically for the waste determination;
  - For hazardous waste generated off-site, information provided to TSDF by waste generator.

Subpart CC: Container Control Requirements

Container Standards are Organized into Three Levels

- Less than 26.4 gallons are exempt
- Level 1
  - *Less than or equal to 122 gallons, or*
  - *Larger than 122 gal AND do not manage hazardous waste in light material service*
- Level 2
  - *Larger than 122 gal AND manages hazardous waste in light material service*
- Level 3
  - *Larger than 0.1 m^3 (26.4 gallons) AND treat hazardous waste by a stabilization process*

Container Level 1 Controls

- Three control alternatives
  - *Use container that meets DOT regulations*
  - *Use a tight-fitting cover on the container and ensure there are no visible gaps*
  - *Use organic vapor suppression barrier on or above the hazardous waste in the container*
- May use conservation vents or safety vents if normally closed

DOT Container Use and Compliance with Subpart CC Container Standards

- In DOT Hazardous Materials (HzMat) regulations, waste makeup or constituents all have specified DOT containers in which the waste is allowed to be stored and transported.
- Each approved container for a specific waste has been tested in a multi-test procedure by DOT.
- Approved containers for specific waste constituents can be found tabulated in 49 CFR §172
- The DOT code for the container is embossed in the container's construction.

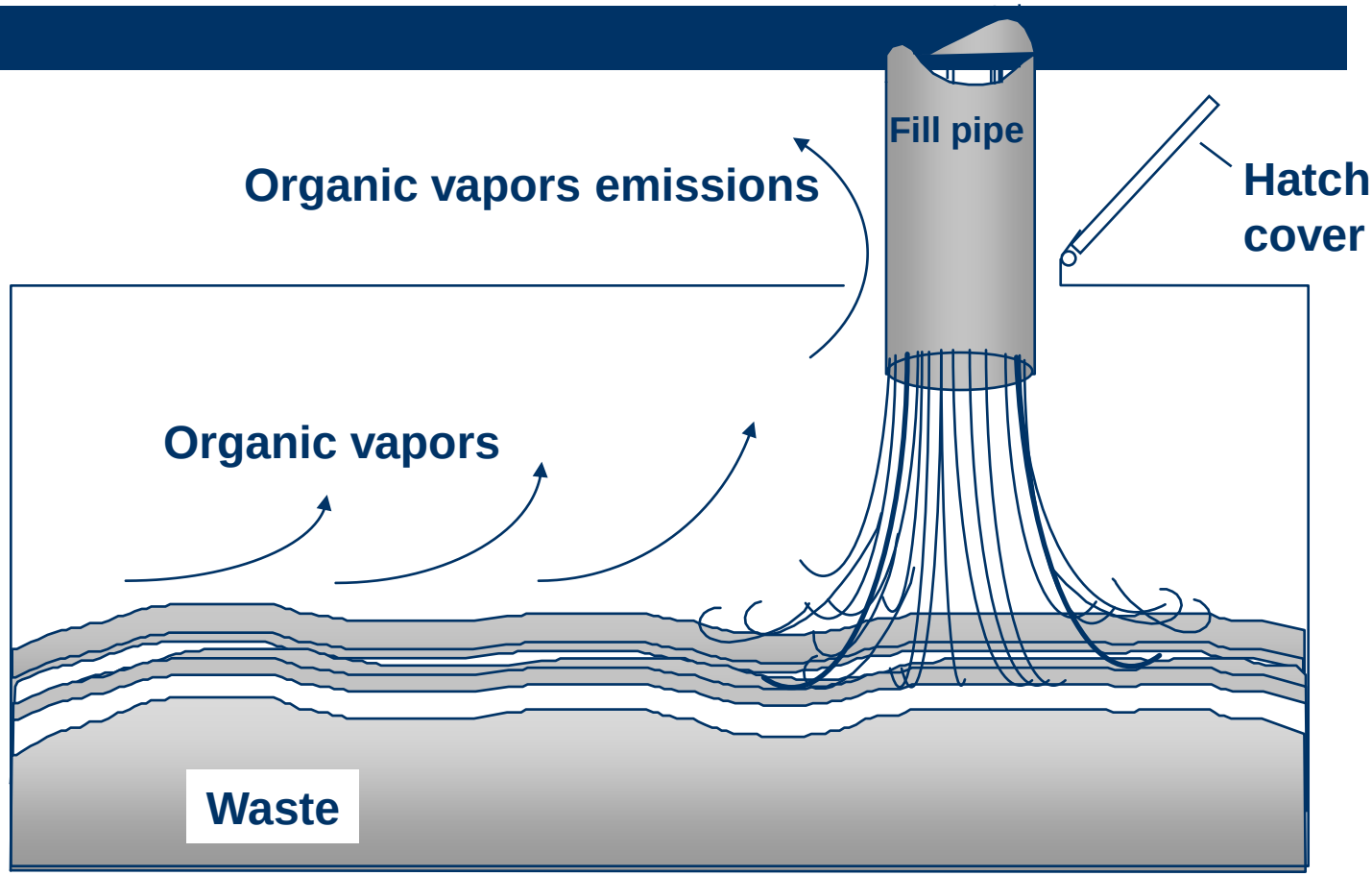
Subpart CC Container Standards: DOT Container Violations

- A facility that places hazardous waste in a container that is not specifically approved for that waste; is not in compliance with RCRA Subpart CC, if DOT-compliant containers are their designated control option.
- A facility should include the DOT container types they intend to use for each waste or grouping of waste they will be handling in their RCRA Part B Permit Application.

Container Level 2 Controls

- Three control alternatives:
  - Use container that meets DOT regulations
  - Use container that operates with no detectable organic emissions as tested using Method 21
  - Use container that is demonstrated to be vapor-tight within the last 12 months using Method 27

Splash Loading: Not Allowed for Level 2 Containers



Container Level 3 Controls

- Two control alternatives
  - Vent container directly through a closed-vent system to a control device, or,
  - Container inside an enclosure which is exhausted through a closed-vent to a combustion control device.
- Transfer requirements same as Level 2.
- Standard specifies design and operating criteria for venting vapors directly to a control device.

Container Level 3 Enclosures

- Enclosures must meet the design and operating criteria specified in “Procedure T Criteria for and Verification of a Permanent or Temporary Total Enclosure” under 40 CFR §52.741.

Subject Container Example: The Dumpster

Subject Container Example: The Roll-off

Subject Container Example: The Vacuum Truck

Subpart CC:
Control Requirements for Tanks

Tank Control Requirement Considerations

- Two levels of air emission controls for tanks containing hazardous waste which have volatile organic (V0) concentration $\geq$ 500 ppmw at point of waste generation.
- Level of compliance is dependent on the volume of the tank and the vapor pressure of the worst case waste at normal atm conditions:
  - Level 1 (less extensive)
  - Level 2 (more extensive)

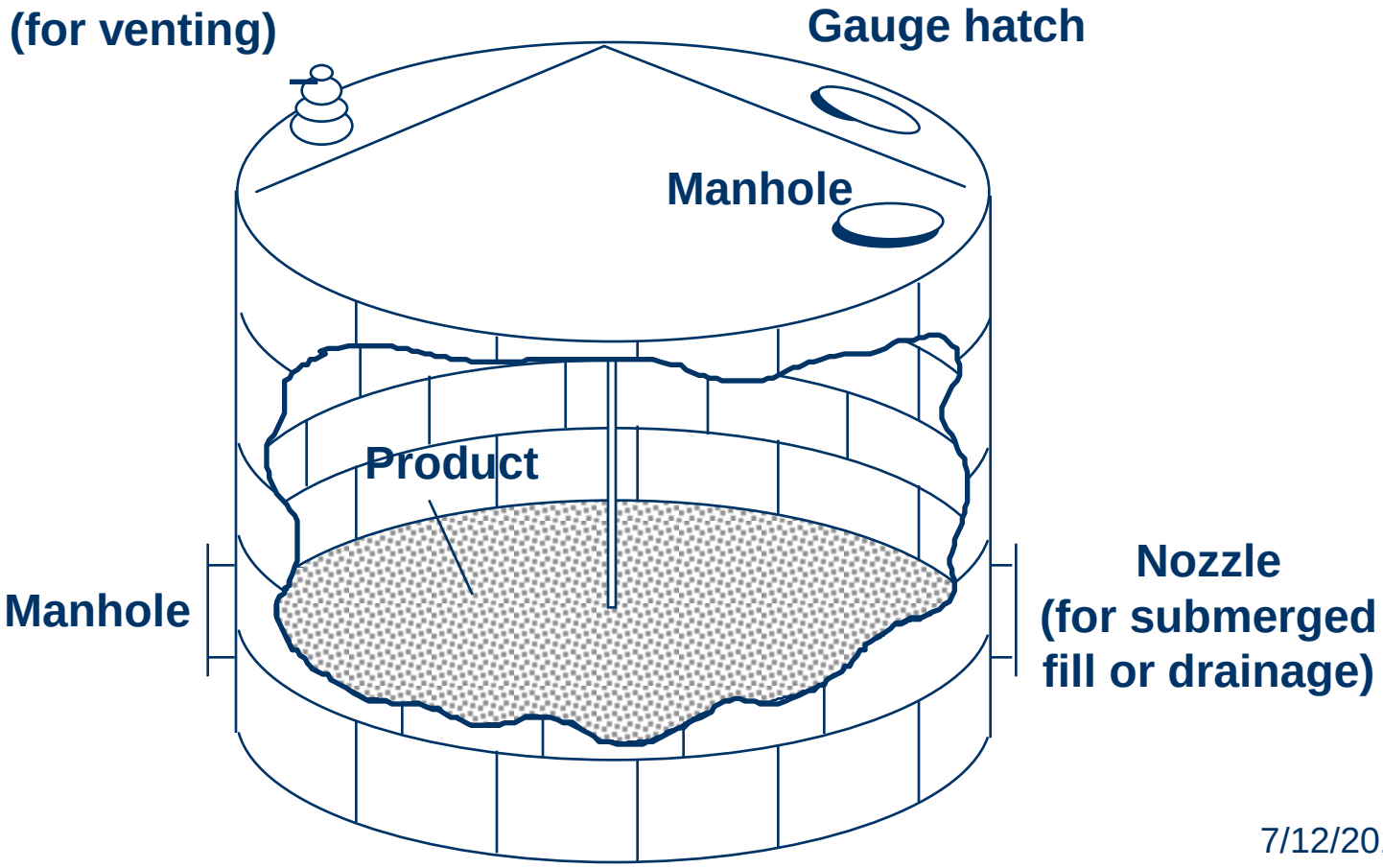
Tank Level 1

- Tank must meet ALL three conditions to qualify to use Tank Level 1 controls
  - Maximum organic vapor pressure of waste is less than tank design capacity for the maximum organic vapor pressure of the worst case hazardous waste managed.
  - Contents are not heated to temperatures above the temperature of vapor pressure determination.
  - No waste stabilization done in the tank.

Tank Level 1 Controls - Fixed Roof

- Fixed roof is stationary (doesn't fluctuate with the level of material in tank):
  - An integral part of the structural design, or,
  - May separate from rest of tank (e.g., removable top on a vertical tank).
- Fixed roof openings can be equipped with:
  - Closure devices **if** no visible cracks, holes, gaps or other open spaces when secured in closed position.
  - Permanent openings **if** vented to an organic emission control device.
  - Pressure relief devices (e.g., conservation vent) that are vented to atmosphere if set point is appropriate for tank design pressure limits.

Typical Fixed-Roof Tank



Tank Level 2 Controls

- Tanks that hold waste exceeding the Level 1 criteria or can not be proved otherwise are required to use Level 2 controls.

Tank Level 2 - Design Options

- Five design options allowed for Level 2 Tank Controls:
  - Cover vented to control device
  - Pressure tank
  - Tank inside enclosure which is vented to combustion control device
  - Fixed roof with internal floating roof
  - External floating roof.

Waste Transfer Operations

- Transfer of hazardous waste among Level 2 tanks and surface impoundments subject to Subpart CC, must be conducted using hard-piping or other closed system that does not allow exposure of the waste to the atmosphere

- An individual drain system meeting the requirements of 40 CFR §63, Subpart RR is considered a closed system

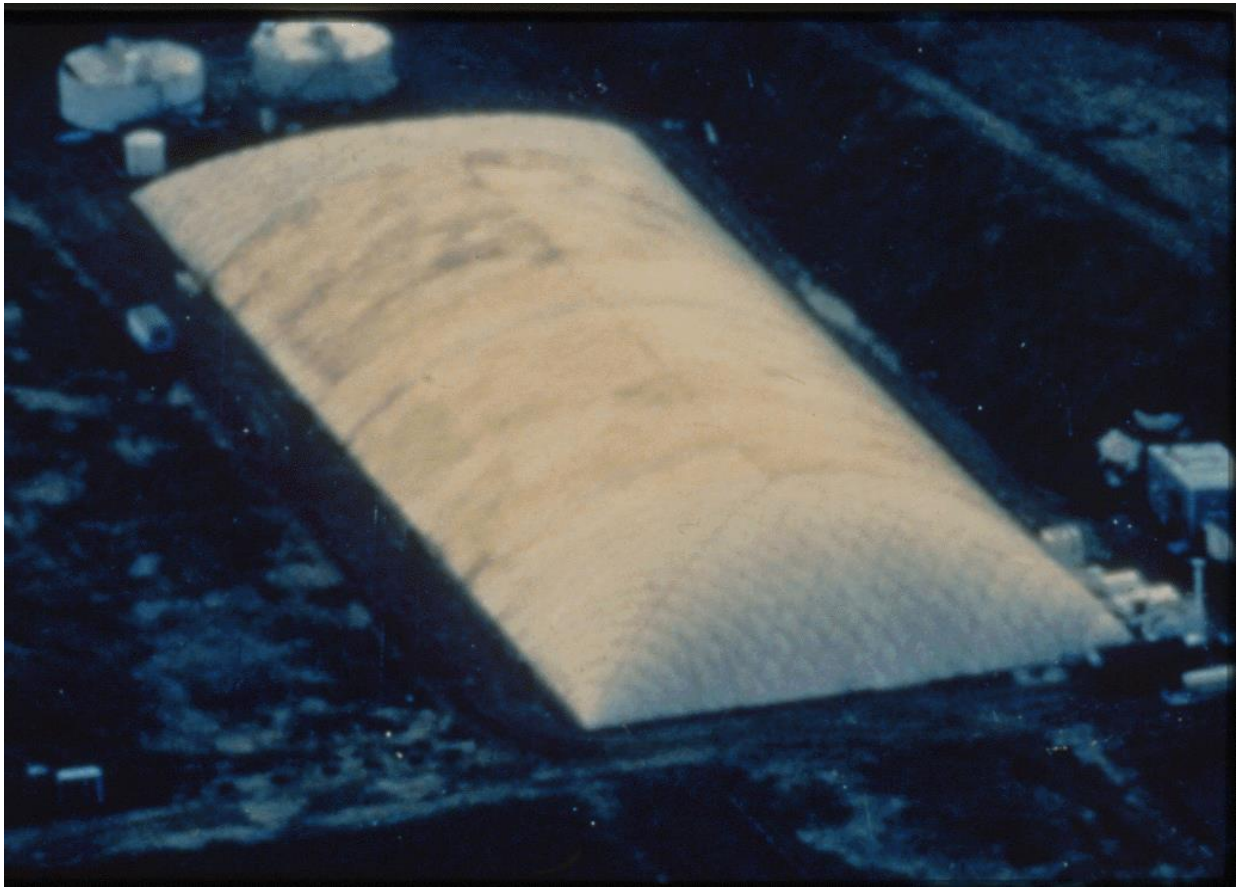
Control Requirements for Surface Impoundments

Subpart CC: Surface Impoundments

- Floating membrane cover, or
- Cover and vent to a control device, or,
- Demonstration that Subpart CC controls are not required:
  - Waste placed in unit has average VO concentration < 500 ppmw at the point of waste origination, or,
  - Waste placed in unit has been treated to meet LDRs for organics or by one of the treatment alternatives specified in the rule,
  - Unit is used for biological waste treatment (meeting requirements for biological treatment alternative).

Subpart CC Example: Floating Cover

Subpart CC Example: Cover Vented To A Control Device



RCRA Organic Air Emission Standard On-line:

- Complete Workshop Application (based on intense, Region 4, 3-day Workshop),
- Searchable for research topics,
- Non-linear, so you can review only information you need,
- Includes all reference documents with hyperlinks in the training to the reference,
- Narrated w/speaker notes;
- Available at the EPA Environmental Response Training Programs Virtual University (ERTPVU) at this link:

RCRA Organic Air Emission Standards

Note: You will need to establish a user name and pass word with the ERTPVU.

RCRA Organic Air Emission Standards Handy Flipbook

- Designed for quick reference in the field.
  - *The requirement for each device, HWMU and piece of equipment*
  - *Documents that should be at the facility to demonstrate compliance*.

Get the RCRA Organic Air Emissions Standards Flipbook here now.

Thank you for your interest.

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