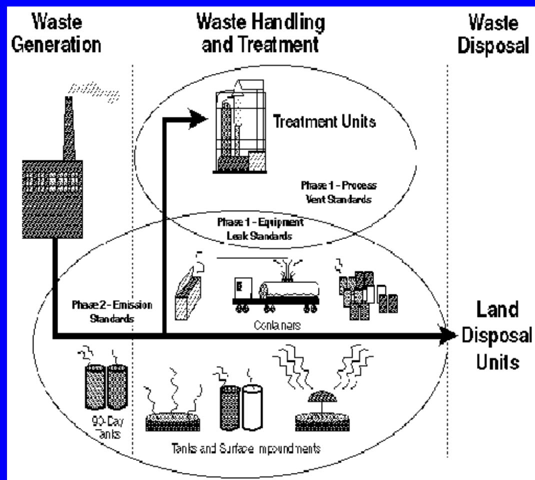
Subpart CC - Issues of Stabilization and Treatment



When Does Organic Air Emission Control of Regulated Waste Stop?

- Units are **exempted or excluded** (e.g.,WWTF/NPDES)
- Waste meets **Land Disposal Requirements** (LDRs)
  - All hazardous waste entering the unit meets the appropriate concentration limit or was treated by a technology established for the waste in 40 CFR §268
- Waste meets **Treatment Standards**
  - The organic content of the hazardous waste entering the unit has been sufficiently reduced using one of eight treatment process alternatives

We often see waste treatment for degradable organics using aerated tanks or lagoon. Most facilities will call this RCRA exempt based on NPDES permitting. The NPDES exemption is a powerful tool, but the agency must closely evaluate its appropriateness. Meanwhile, aerated tanks and lagoons are quite good at losing VOCs from the wastestream - and not always by degradation.

Waste Treatment - A Two Edged Sword?

- Treatment may bring the endpoint of RCRA air emission control requirements
- However, treatment causes increased requirements
  - For containers and tanks under Subpart CC
  - For some treatment facilities under Subpart AA

Point of waste treatment means the point where a hazardous waste to be treated in accordance with Sec. 265.1083(c)(2) of Subpart CC exits the treatment process. Any waste determination shall be made before the waste is conveyed, handled, or otherwise managed in a manner that allows the waste to volatilize to the atmosphere.

Effect of Treatment/Stabilization

Requirements if Storage	Requirements if Treatment
Container Level 1 or Level 2 Requirements • DOT container, no detectable emissions or vapor tight • Visual inspection Level 1 Tank Requirements • Fixed roof – no visible cracks • Annual inspection (visual) • Records about vapor pressure determination	Container Level 3 or Tank Level 2 Requirements • Cover vented to a control device, or enclosure vented to a control device • Negative pressure or no detectable emissions (instrument monitoring during inspections) • Control device continuous operation • Constant testing and monitoring of control device • Semiannual reporting of exceedences Note: other options available for tank compliance (IFR, EFR, pressure tank)

Level 2 control can be achieved if a waste is placed in a container (e.g., a rail car) that, within the preceding 12 months, has been shown to be vapor tight per 40 CFR Part 60, Appendix A, Method 27. A vapor-tight container must lose less than 750 pascals (0.11 psi) within 5 minutes after being pressurized to 4.5 kPa (0.66 psi) as required in 40 CFR §264.1086 (h)(3) or §265.1087 (h)(3) .

Requirements for filling and emptying Level 2 containers are codified in 40 CFR §264.1086 (d)(2) or §265.1087 (d)(2). The November 25, 1996 preamble (61 FR 59948) states " For containers using Level 2 controls, the loading requirements have been revised to allow the owner or operator the flexibility to use any appropriate loading method that will minimize exposure of the hazardous waste to the atmosphere and thereby reduce organic air emissions to the extent practicable considering the physical properties of the hazardous waste and good engineering and safety practices." In the January 21, 1999 amendments (64 FR 3389), EPA added loading requirements for Level 3 containers that are identical to those for Level 2 containers.

Regulatory Definition: Waste Stabilization

- Any physical or chemical process used to either reduce the mobility of hazardous constituents in a hazardous waste or eliminate free liquids
- Includes the mixing of hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture
- Does not include the adding of absorbent materials to the surface of a waste, without mixing, agitation, or subsequent curing, to absorb free liquid

Waste stabilization process means any physical or chemical process used to either reduce the mobility of hazardous constituents in a hazardous waste or eliminate free liquids as determined by Test Method 9095 (Paint Filter Liquids Test) in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992 (incorporated by reference–refer to Section 260.11 of this chapter). A waste stabilization process includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture. Other synonymous terms used to refer to this process are waste fixation or waste solidification.

EPA clarified in the December 8, 1997 technical corrections (62 FR 64651) that the addition of sorbent to waste material while it is being transferred from one container to another is considered waste stabilization and requires Level 3 container controls. However, adding sorbent to the surface of a waste, without mixing, agitation, or curing (such as to absorb free liquid, adding sorbent to a container at the end of a work day or at the completion of a waste transfer is <u>not</u> waste stabilization and therefore does not require Level 3 control.

Consideration of Treatment Processes - Waste Stabilization or Not?

1. Placing soil in drums with vermiculite on top
2. Blending soil with cement stabilizers
3. Thermal separation of oil from soil
4. Biological degradation of organics in soil
5. Activated carbon adsorption
6. Activated sludge-powdered activated carbon

1. Not stabilization, unless the vermiculite is mixed into the waste.

2. Stabilization, as cement reduces the mobility of the hazardous constituents.

3. Treatment but not stabilization.

4. Treatment but not stabilization.

5. May be considered stabilization, as the adsorption reduces the mobility of the hazardous constituents. Depends on waste stream concentration or source.

6. May be considered stabilization, as the powdered activated carbon adsorbs contaminants, which reduces the mobility of the hazardous constituents. Depends on waste stream concentration or source.

Consideration of Treatment Processes - Waste Stabilization or Not? (cont'd)

7. Screening and grit removal
8. Gravimetric separation of oil (oil-water separation)
9. Dissolved air floatation for oil separation
10. Alkaline adjustment for heavy metal precipitation
11. Coagulation, flocculation, and sedimentation
12. Distillation
13. Air stripping

7. Treatment but not stabilization. However, grit removal in an aerated grit chamber may involve tremendous application of air flow, resulting in a de facto air stripping operation that could be Subpart AA regulated.

8. Treatment but not stabilization.

9. Treatment but not stabilization. Additionally, the off-gas from the air entrainment may constitute an air stripping operation subject to Subpart AA.

10. Treatment but not stabilization, unless there is precipitation.

11. May be considered stabilization, as the coagulation, flocculation and sedimentation processes cause a reduction in contaminant mobility. Depends on waste stream concentration or source.

12. Treatment but not stabilization.

13. Treatment but not stabilization.

Consideration of Treatment Processes - Waste Stabilization or Not? (cont'd)

14. Chemical oxidation
15. Rapid sand or membrane filtration
16. Slow sand or trickling filtration
17. Sludge thickening
18. Sludge belt filter pressing
19. Sludge anaerobic digestion

14. Treatment but not stabilization.

15. Treatment but not stabilization.

16. Treatment but not stabilization.

17. Treatment but not stabilization.

18. Treatment but not stabilization.

19. Treatment but not stabilization.

Treatment Standards

Defining the Endpoint for Subpart CC Controls

Treatment Process Alternatives/Standards

- Eight alternatives
- Evaluate reduction in organic content of waste
  - Numerical comparison methods
  - Treatment technology
- Key issues:
  - Number of measurements and location
  - Number of waste streams
  - Concentration difference between waste streams

Eight Treatment Process Alternatives

- Exit concentration limit
- Organic reduction efficiency
- Mass removal rate
- Biological degradation
- General concentration criteria
- Organic reduction efficiency - the sequel
- Incineration
- BIF

Definitions and Terminology

- Average VO concentration at waste origination, C_{VO}
- Average VO concentration at waste treatment, C_{VO}
- Exit concentration limit, C_t
- Organic reduction efficiency, R
- Organic biodegradation efficiency, R_{bio}
- Required organic mass removal rate, RMR
- Organic mass removal rate, MR
- Organic mass biodegradation rate, MR_{bio}

Average VO concentration at waste origination can be determined by process knowledge

Average VO concentration at waste treatment must be determined by testing

Average VO Concentration at Point of Waste Origination, C_{VO} [40 CFR §265.1084(a)]

- To determine C_{VO} using process knowledge, document the information used as the basis for the knowledge of the average VO concentration of the hazardous waste system
- If test data are used, document the method, sampling protocol, and means of accounting for sampling and analytical variability in determining C_{VO}
- Test data not obtained by Method 25D may be adjusted to the average VO concentration values that would have been obtained using Method 25D

The sampling protocol is critical. There can be huge variations in results if Method 25D is not used.

Average VO Concentration at Point of Waste Origination, C_{VO} [40 CFR §265.1084(a)] (cont'd)

- Disagreements between facilities and U.S. EPA over the average VO concentrations obtained using process knowledge will be settled by direct measurement
- Examples of information that may be used as the basis for process knowledge include:
  - Material balances
  - Previous but still applicable constituent-specific chemical test data on the hazardous waste stream
  - Previous test data from other locations managing the same type of waste stream
  - Knowledge based on manifests, shipping papers, or waste certification notices

Average VO Concentration at Point of Waste Origination, C_{VO} [40 CFR §265.1084(a)]

- The average VO concentration on a mass-weighted basis is calculated using the following equation

$$C_{VO} = \frac{1}{Q_T} \sum_{i=1}^{n} (Q_i \ C_i)$$

C_{VO} = Average VO concentration at point of waste origination on a mass-weighted basis, ppmw
i = Individual sample "i"
n = Total number of hazardous waste samples collected over the averaging period
Q_i = Mass flow rate of the hazardous waste stream represented by Ci, kg/hr
Q_T = Total mass flow rate of hazardous waste during the averaging period, kg/hr
C_i = Measured VO concentration of sample "i" obtained from analysis, ppmw

Average VO Concentration at Point of Waste Treatment C_{VO} [40 CFR §265.1084(b)(3)]

- The procedure is the same as outlined in 40 CFR §265.1084(a)(3) - direct measurement
- Process knowledge cannot be used

Exit Concentration Limit, C_t

[40 CFR §265.1084(b)(4)]

- Identify the point of waste origination for each hazardous waste treated by the process at the same time
- If only one waste stream is treated, the exit concentration limit is 500 ppmw
- If more than one waste stream is treated at the same time, the average VO concentration at the point of origination is determined for each waste stream using the methods in 40 CFR §265.1084(a)(2)
- C_t will represent a weighted average and will depend on how many of the waste streams have a C_{VO} less than 500 ppmw and how many have a C_{VO} equal to or greater than 500 ppmw

Group Exercise

Truth or Consequences

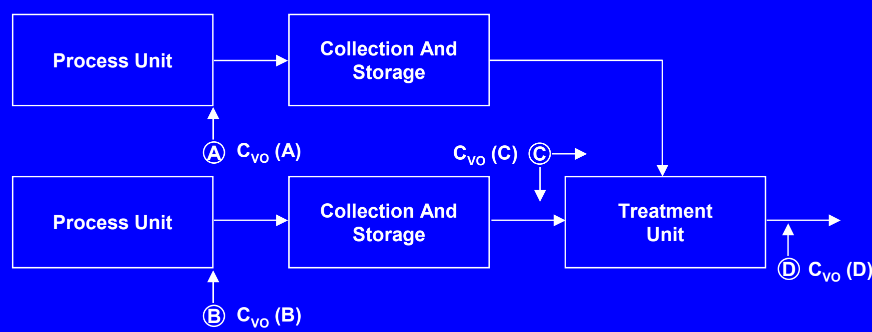
Using the following slides, determine if a Subpart CC endpoint has truly been reached

Treatment Process Alternative 1

[40 CFR §264.1082(c)(2)(i) or 40 CFR §265.1083 (c)(2)(i)]

- A process in which the VO concentration at the point of treatment (C_{VO}) is less than the exit concentration limit (C_t) for the process
- C_t accounts for mixing of streams with VO concentrations above and below 500 ppmw
  - For C_{VO} refer to 40 CFR §265.1084(b)(3)
  - For C_t refer to 40 CFR §265.1084(b)(4)

Treatment Process Alternative 1 "Exit Concentration Limit (C_t)"



A = Point of waste origination, C_{VO} (A) > 500 ppm
B = Point of waste origination, C_{VO} (B) < 500 ppm
D = Exit concentration, C_{VO}

$$C_{VO} < C_t$$

C_t is calculated using VO concentration at points A and B
C_{VO} is determined at point D, point of waste treatment

Advantages - Exit Concentration Limit (C_t) (Alternative 1)

- Accommodates mixing of waste streams, accounts for dilution
- Does not require 95 percent reduction for every influent waste stream
- Limits the number of waste determinations required

Example - Exit Concentration Limit (C_t) (Alternative 1)

- Find the concentration required for no further control
- Waste Stream #1: C_{VO}=50 ppm at 400 gpm
  - C_{VO}=50 ppm, C_t =50 ppm
  - No control required.
- Waste Stream #2: C_{VO}=10,000 ppm at 10 gpm
  - C_{VO}=10,000 ppm, C_t =500 ppm.
- If both waste streams are combined:
  - C_{VO}=293 ppm, C_t =61 ppm.

Example - Exit Concentration Limit (C_t) (Alternative 1) (cont'd)

- Find the concentration required for no further control
- C_{VO}=10,000 ppm at 10 gallons per minute, plus C_{VO}=20 ppm at 400 gallons per minute?
  - C_{VO}=263 ppm, C_t=32 ppm
- C_{VO}=10,000 ppm at 400 gallons per minute, plus C_{VO}=20 ppm at 10 gallons per minute?
  - C_{VO}=9,756 ppm, C_t =488 ppm

Example - Exit Concentration Limit (C_t) (Alternative 1) (cont'd)

- What is the C_{VO} and C_t for the following mixture?
- 3000 ppm at 10 gpm
  20 ppm at 400 gpm
  400 ppm at 10 gpm
  100 ppm at 40 gpm
  0 ppm at 40 gpm
- Q=500 gpm; C_{VO}=92 ppm, C_t =42 ppm

Treatment Process Alternative 2

[40 CFR §264.1082(c)(2)(ii) or 40 CFR §264.1083(c)(2)(ii)]

- A process in which the organic reduction efficiency, R, is equal to or greater than 95 percent and the average VO concentration at the point of treatment, C_{VO}, is less than 100 ppmw
- R is based on the actual VO concentration entering the treatment process
  - For C_{VO} refer to 40 CFR §265.1084(b)(3)
  - For R refer to 40 CFR §265.1084(b)(5)

Organic Reduction Efficiency, R

[40 CFR §265.1084(b)(5)]

- Based on a minimum of three consecutive runs
- All hazardous waste streams entering and exiting the treatment process are identified
- A sampling plan that accurately reflects the retention time of hazardous waste in the process must be prepared
- For each run, determine for each identified waste stream:
  - The mass of each entering waste stream, $Q_{b,}$ and the mass of each exiting waste stream, Q_a
  - Determine $C_{VO, in}$ for each entering stream by 40 CFR §265.1084(a)(3) (i.e., by direct measurement)
  - Determine $C_{VO, out}$ for each exiting stream by 40 CFR §265.1084(b)(3)

Organic Reduction Efficiency, R

[40 CFR §265.1084(b)(5)] (cont'd)

- The waste volatile organic mass entering (Eb) and exiting (Ea) the process shall be calculated using the following equations

$$E_b = \frac{1}{10^6} \sum_{j=1}^{m} [Q_{bj}(c_{vo,in})_j]$$

$$E_a = \frac{1}{10^6} \sum_{j=1}^{m} [Q_{aj}(c_{vo,out})_j]$$

E_a = Waste volatile organic mass flow exiting process, kg/hr
E_b = Waste volatile organic mass flow entering process, kg/hr
m = Total number of runs
j = Individual run "j"
Q_b = Mass of hazardous waste entering during run"j," kg/hr
Q_a = Mass of hazardous waste exiting during run "j," kg/hr

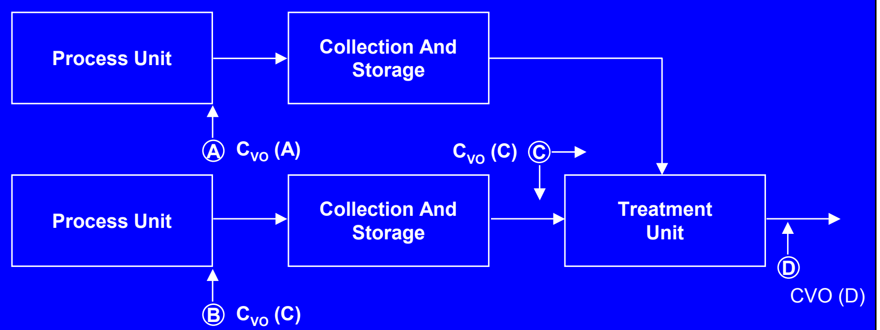
Organic Reduction Efficiency, R

[40 CFR §265.1084(b)(5)] (cont'd)

- Once E_b and E_a are calculated, R is calculated using the following equation

$$R = \left(\frac{E_b - E_a}{E_b} \right) \times 100\%$$

Treatment Process Alternative 2 "Organic Reduction Efficiency (R)"



A = Point of waste origination
B = Point of waste origination
C = Point where waste enters process, mass entering calculated at this point
D = Exit point, mass exiting calculated at this point

$$R = \frac{\text{Mass (in)} - \text{Mass (out)}}{\text{Mass (in)}} \quad [R \geq 95\% \text{ and } C_{VO} < 100 \text{ ppmw}]$$

C_{VO} is determined at point D, point of waste treatment

Advantages - Organic Reduction Efficiency (R) (Treatment Alternative 2)

- Limits the number and location of waste determinations required; none at point of waste origination
- Measurements limited to waste entering and exiting treatment unit
- Appropriate for cases where a large number of waste streams are combined for central treatment

Example - Organic Reduction Efficiency (R) (Treatment Alternative 2)

- Waste enters thermal desorption unit from roll-off, with a C_{VO} average = 1200 ppm
- Treatment operates at 20,000 kg in 2 hours
- Waste leaves treatment at 16,000 kg in 2 hours, with the rest of the material being recovered in a condenser

Example - Organic Reduction Efficiency (R) (Treatment Alternative 2) (cont'd)

- What are the values of Q_b and E_b, representing waste entering treatment?
  - Q_b=10,000 kg/hr, E_b=12
- What is the value of Q_a, representing waste exiting treatment?
  - Q_a =8,000 kg/hr
- Assuming an R=95 percent, what is the E_a for waste exiting treatment?
  - E_a=0.6
- For the E_a calculated, what is the C_{VO} required for no further control?
  - C_{VO} =75 ppm

Treatment Process Alternative 3

[40 CFR §264.1082(c)(2)(iii) or 40 CFR §264.1083(c)(2)(iii)]

- A process for which the actual process organic mass removal rate (MR) is equal to or greater than the required organic mass removal rate (RMR) established for the process
- MR represents the difference between the mass entering and exiting the process while RMR is based on the mass at the point of origination
  - For MR refer to 40 CFR §265.1084(b)(8)
  - For R refer to 40 CFR §265.1084(b)(7)

Organic Mass Removal Rate (MR)

[40 CFR §265.1084(b)(8)]

- Based on results for a minimum of three consecutive runs with a sampling time of one hour for each run
- Determine E_b and E_a in accordance with 40 CFR §265.1084(b)(5)(iv)
- Determine the actual organic mass removal rate (MR) using the following equation:

$$MR = E_b - E_a$$

- E_b and E_a represent the waste volatile organic mass entering and exiting the process, respectively
- All parameters are in kg/hr

Required Organic Mass Removal Rate (RMR) [40 CFR §265.1084(b)(7)]

- Identify all hazardous waste streams entering the process
- Determine C_{VO} for each entering waste stream at its point of waste origination using 40 CFR §265.1084(a) (i.e., either direct measurement or process knowledge)
- For each hazardous waste stream with a C_{VO} equal to or greater than 500 ppmw, determine the average volumetric flow rate, V_y, and the density k_y
- The calculation of RMR includes only those hazardous waste streams with a C_{VO} equal to or greater than 500 ppmw

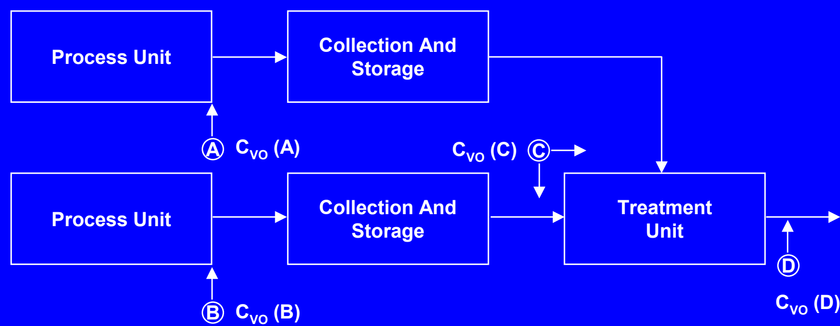
Required Organic Mass Removal Rate, RMR [40 CFR §265.1084(b)(7)] (cont'd)

- RMR is calculated using the following equation

$$RMR = \sum_{y=1}^{n} \left[V_y \, k_y \, \frac{(C_{vo,y} - 500 \text{ ppmw})}{10^6} \right]$$

RMR	=	Required organic mass removal rate, kg/hr
y	=	Individual waste stream "y" with a C_{VO} equal to or greater than 500 ppmw
n	=	Total number of "y" waste streams
V_Y	=	Average volumetric flow rate of waste stream "y", m^3/hr
k_Y	=	Density of hazardous waste stream "y," kg/m^3
$C_{VO,Y}$	=	C_{VO} for hazardous waste stream "y" at the point of waste origination, ppmw

Treatment Process Alternative 3 “Mass Removal Rate (MR/RMR)”



A = Point of waste origination
B = Point of waste origination
C = Point where waste enters process, mass entering calculated at this point
D = Exit point, mass exiting calculated at this point

MR = Mass (in) – Mass (out)

[MR > RMR]

Advantages - Mass Removal Rate (MR/RMR) (Treatment Process Alternative 3)

- Formatted in terms of mass rather than concentration; limits number of VO waste determinations
- RMR is not waste stream specific; based on aggregated mass of the untreated waste
- Does not require 95 percent reduction for every influent waste stream

Treatment Process Alternative 4

[40 CFR §264.1082(c)(2)(iv) or 40 CFR §265.1083(c)(2)(iv)]

- A biological process in which both the process organic reduction efficiency (R) and the process biodegradation efficiency (R_{bio})are equal to or greater than 95 percent, <u>or</u>
- A biological process in which the total actual organic mass biodegradation rate (MR_{bio}) for the process is equal to or greater than the required organic mass removal rate, RMR
  - For R refer to 40 CFR §265.1084(b)(5)
  - For R_{bio} refer to 40 CFR §265.1084(b)(6)
  - For MR_{bio} refer to 40 CFR §265.1084(b)(9)
  - For RMR refer to 40 CFR §265.1084(b)(7)

Organic Biodegradation Efficiency (R_{bio})

[40 CFR §265.1084(b)(6)]

- Determine the fraction of organics biodegraded (F_{bio})using the procedures in 40 CFR Part 63, Appendix C (EPA Method 304A or 304B)

$$R_{bio} = F_{bio} \times 100\%$$

Organic Mass Biodegradation Rate (MR_{bio})

[40 CFR §265.1084(b)(9)]

- Based on results for a minimum of three consecutive runs with a sampling time of one hour for each run
- Determine E_b in accordance with 40 CFR §265.1084(b)(5)(iv)
- Determine the fraction of organics biodegraded (F_{bio}) using the procedures in 40 CFR Part 63, Appendix C

$$MR_{bio} = E_b \times F_{bio}$$

- MR_{bio} and E_b are in kg/hr. F_{bio} is dimensionless

Advantages - Biological Treatment (Treatment Process Alternative 4)

- Allows use of aerobic biodegradation in uncovered units
- R_{bio} appropriate for cases where large number of waste streams combined for central waste treatment
- MR_{bio} and RMR are not waste stream specific; RMR is based on aggregated organic mass of untreated waste; does not require 95 percent reduction for every waste stream

Treatment Process Alternative 5

[40 CFR §264.1082(c)(2)(v) or 40 CFR §264.1083(c)(2)(v)]

- A generalized approach in which the average VO concentration at the point of waste treatment [40 CFR §265.1084 (b)(3)] must be less than the lowest average VO concentration determined for each of the waste streams entering the process [40 CFR §265.1084 (a)(2)] or 500 ppmw, whichever value is lower
- Two requirements on the waste stream
  - Air emission controls required between the point of waste origination and the point where the waste enters the unit
  - All transfers between the point of origination and the point where the waste enters the unit must be accomplished using a closed system

Advantages - Miscellaneous/General (Treatment Process Alternative 5)

- Limits the number of waste determinations needed; data on flow rate and organic mass not needed
- Measurements limited to waste entering and exiting treatment unit
- Does not require 95 percent reduction for every influent waste stream
- Simplifies compliance determination

Example for General/Miscellaneous (Treatment Process Alternative 5) (cont'd)

- What concentration is required for no further control?
- 3000 ppm at 10 gpm — 280 ppm at 400 gpm

  400 ppm at 10 gpm — 900 ppm at 40 gpm

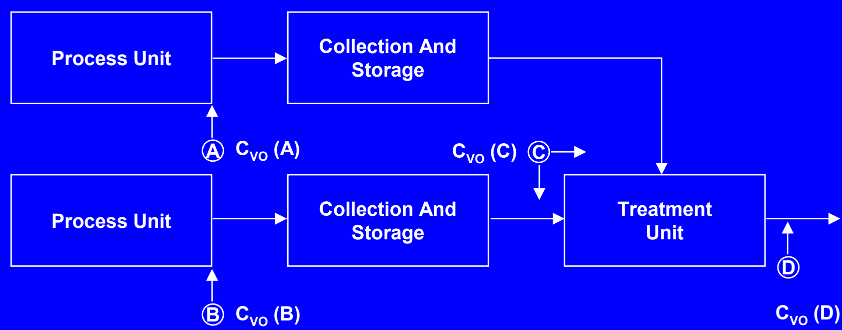
  1700 ppm at 40 gpm
- Q=500 gpm, C_{VO} =500 ppm, C_{VO} req'd (C_t)=280 ppm
- Better idea: Split out the waste streams with C_{VO} at point of origination less than 500 ppm, and treat to lowest C_{VO} value. Remaining waste streams must be treated to 500 ppm or below.

Treatment Process Alternative 6

[40 CFR §264.1082(c)(2)(vi) OR 40 CFR §265.1083(c)(2)(vi)]

- A process in which the organic reduction efficiency (R) is equal to or greater than 95 percent and
- C_{VO} at the point of origination for each of the individual waste streams is certified to be less than 10,000 ppmw
- The calculation of R is based on the actual C_{VO} of the waste entering the process
  - For C_{VO} of individual waste streams refer to 40 CFR §265.1084(a)(2)
  - For R refer to 40 CFR §265.1084(b)(5)

Treatment Process Alternative 6 - "Organic Reduction Efficiency (R)"



A = Point of waste origination
B = Point of waste origination
C = Point where waste enters process, mass entering calculated at this point
D = Exit point, mass exiting calculated at this point

$$R = \frac{\text{Mass (in)} - \text{Mass (out)}}{\text{Mass(in)}} \qquad [R \geq 95\% \text{ and } C_{VO} < 10{,}000 \text{ ppmw}]$$

C_{VO} is determined at points A and B, point of waste origination

Advantages - Organic Reduction Efficiency (R) (Treatment Process Alternative 6)

- Limits the number and location of waste determinations required
- Certification off-sets need for determinations at point of waste origination
- Appropriate for cases where a large number of waste streams are combined for central treatment

Example - Organic Reduction Efficiency (R) (Treatment Process Alternative 6)

- Waste enters thermal desorption unit from roll-off, with all waste origination levels demonstrated to be always below 10,000 ppm
- Waste entering has a C_{VO} average = 3000 ppm
- Treatment operates at 20,000 kg in 2 hours
- Waste leaves treatment at 16,000 kg in 2 hours, with the rest of the material being recovered in a condenser

Example - Organic Reduction Efficiency (R) (Treatment Process Alternative 6) (cont'd)

- What are the values of Q_b and E_b, representing waste entering treatment?
  - Q_b=10,000 kg/hr, E_b=30
- What is the value of Q_a , representing waste exiting treatment?
  - Q_a=8,000 kg/hr
- Assuming an R=95 percent, what is the E_a for waste exiting treatment?
  - E_a=1.5
- For the E_a calculated, what is the C_{VO} required for no further control?
  - C_{VO} =188 ppm

Treatment Process Alternative 7

[40 CFR §265.1083(c)(2)(vii)]

- Combustion process - Incinerators
  - Final permit under 40 CFR §270 and meets requirements of 40 CFR §264, Subpart O, or
  - Designed and operates in accordance with interim status requirements of 40 CFR §265, Subpart O

Treatment Process Alternative 8

[40 CFR §265.1083(c)(2)(viii)]

- Combustion process - Boilers or industrial furnaces
  - Final permit under 40 CFR §270 and meets requirements of 40 CFR §266, Subpart H, or
  - Designed and operates in accordance with interim status requirements of 40 CFR §266, Subpart H

Advantages - Combustion Process (Treatment Process Alternatives 7 & 8)

- No VO waste determinations needed
- No data on flow rate and/or organic mass needed
- No dedicated treatment equipment required

Additional Exemption for Treated Hazardous Waste

[40 CFR §265.1083(c)(4)]

- Tanks, surface impoundments, containers exempt from Subpart CC control requirements if waste
  - Meets LDR numerical concentration limits as specified in 40 CFR §268, Table "Treatment Standards for Hazardous Waste" in 40 CFR §268.40
  - Has been treated by the treatment technology established for the waste in 40 CFR §268.42(a) or treated by an equivalent method pursuant to 40 CFR §268.42(b)

Summary

- Subpart CC air emission controls are not required if the organic content of the waste has been reduced by one of the treatment processes specified in rule
  - Exit concentration limit
  - Organic reduction efficiency (2)
  - Mass removal rate
  - Biological degradation
  - General concentration criteria
  - Incineration
  - BIF