

MON Wastewater



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Wastewater Topics



- ⌘ Definitions and rule concepts
- ⌘ How to determine G1/G2 streams
- ⌘ Maintenance WW plan
- ⌘ Aqueous in-process streams
- ⌘ Recovery vs. compliance treatment
- ⌘ Halogenated vents
- ⌘ Offsite treatment
- ⌘ Update on Wastewater NSPS, Subpart YYY

Wastewater Concepts

⌘ Basically “doin’ the HON” with a few tweaks

☑ only exists after discard from a MCPU

⌘ Process wastewater

☑ includes cleaning operations in between batches

☑ must control if meet Group 1 criteria

☑ numerous compliance options

⌘ Maintenance wastewater

☑ develop and implement plan to minimize

⌘ In-process steams in open conveyance

☑ must control if have “Group 1 characteristics”

Key Definitions



⌘ Wastewater

☒ [MON 63.2550(i)]

⌘ Process Wastewater

☒ [HON 63.101]

⌘ Maintenance Wastewater

☒ [MON 63.2550(i)]

⌘ Point of Determination (POD)

☒ [HON 63.111]

⌘ Aqueous in-process stream (AIPs)

☒ [HON 63.149]

Wastewater

[MON 63.2550(i)]

Wastewater means **water that is discarded** from an MCPU through a single POD and that contains either: an annual average concentration of compounds in Table 8 or 9 to this subpart of **at least 5 ppmw** and has an annual average flowrate of **0.02 liters per minute** or greater; **or** an annual average concentration of compounds in Table 8 or 9 to this subpart of **at least 10,000 ppmw at any flowrate**. The following are not considered wastewater for the purposes of this subpart:

- ⌘ (1) Stormwater from segregated sewers;
- ⌘ (2) Water from fire-fighting and deluge systems, including testing of such systems;
- ⌘ (3) Spills;
- ⌘ (4) Water from safety showers;
- ⌘ (5) Samples of a size not greater than reasonably necessary for the method of analysis that is used;
- ⌘ (6) Equipment leaks;
- ⌘ (7) Wastewater drips from procedures such as disconnecting hoses after cleaning lines; and
- ⌘ (8) Noncontact cooling water.

Process Wastewater [HON 63 .101]

Process wastewater means wastewater which, during manufacturing or processing, **comes into direct contact** with or results **from the production or use** of any raw material, intermediate product, finished product, by-product, or waste product. **Examples** are product tank drawdown or feed **tank drawdown**; water formed during a chemical reaction or used as a reactant; **water used to wash impurities** from organic products or reactants; **water used to cool or quench** organic vapor streams through direct contact; and **condensed steam from jet ejector systems** pulling vacuum on vessels containing organics.

Maintenance Wastewater

[MON 63.2550(i)]

Maintenance wastewater means wastewater generated by the draining of process fluid from components in the MCPU into an individual drain system **in preparation for or during maintenance activities**. Maintenance wastewater can be generated during planned and unplanned shutdowns and during periods not associated with a shutdown. Examples of activities that can generate maintenance wastewater include descaling of heat exchanger tubing bundles, cleaning of distillation column traps, draining of pumps into an individual drain system, and draining of portions of the MCPU for repair. **Wastewater from routine cleaning operations occurring as part of batch operations is not considered maintenance wastewater.**

Point of Determination

[HON 63.111]

Point of determination means each **point where process wastewater exits the chemical manufacturing process** unit.

Note to definition for point of determination: The regulation allows determination of the characteristics of a wastewater stream (1) at the point of determination or (2) downstream of the point of determination if corrections are made for changes in flow rate and annual average concentration of Table 8 or Table 9 compounds as determined in Sec. 63.144 of this subpart. Such changes include losses by air emissions; reduction of annual average concentration or changes in flow rate by mixing with other water or wastewater streams; and reduction in flow rate or annual average concentration by treating or otherwise handling the wastewater stream to remove or destroy hazardous air pollutants.

Aqueous In-Process [HON 63.149]



- ⌘ No formal definition, requires control on specific equipment to be consistent with criteria in HON Table 35; i.e. forbids open conveyance of water (process fluids not yet discarded) with Group 1 characteristics
- ⌘ Applies to: drain, drain hub, manhole, lift station, trench, pipe, or oil/water separator, or tank
- ⌘ Examples: open trench or open top vessel

Key Definitions (cont'd)



⌘ Wastewater HAPs

☒ MON Tables 8 & 9

⌘ Recovery Device

☒ [MON 63.2550(i)]

⌘ Individual Drain System (IDS)

☒ [HON 63.111]

⌘ Waste Management Unit

☒ [MON 63.2550(i)]

⌘ Group 1 wastewater stream

☒ [MON 63.2550(i)]

Wastewater HAPs

[MON Tables 8 and 9]

- ⌘ Both MON & HON Rule use same Table names
- ⌘ MON Rule - 76 HAP compounds
 - ⌘ Table 8 - Partially Soluble HAPs (61 cmpds)
 - ⌘ Table 9 - Soluble HAPs (15 cmpds)
- ⌘ HON Rule - 76 HAP compounds
 - ⌘ Table 8 - Very Volatile HAPs (24 cmpds, new CPUs)
 - ⌘ Table 9 - All wastewater HAPs (76 cmpds, existing CPUs & Table 8 is included in Table 9 list)

Recovery Device

[MON 63.2550(i)]

Recovery device means an individual unit of equipment used for the purpose of **recovering chemicals** from process vent streams **for reuse in a process at the affected source** and **from wastewater streams for fuel value** (i.e., net positive heating value), **use, reuse, or for sale for fuel value, use or reuse**. Examples of equipment that may be recovery devices include absorbers, carbon adsorbers, condensers, oil-water separators or organic-water separators, or organic removal devices such as decanters, strippers, or thin-film evaporation units. To be a recovery device **for a wastewater stream, a decanter and any other equipment based on the operating principle of gravity separation must receive only multi-phase liquid streams.**

Individual Drain System

[HON 63.111]

Individual drain system means the stationary system used to **convey wastewater streams or residuals to a waste management unit or to discharge or disposal**. The term includes hard-piping, all process drains and junction boxes, together with their associated sewer lines and other junction boxes, manholes, sumps, and lift stations, conveying wastewater streams or residuals. A **segregated stormwater** sewer system, which is a drain and collection system designed and operated for the sole purpose of collecting rainfall runoff at a facility, and which is segregated from all other individual drain systems, **is excluded from this definition**.

Waste Management Unit

[MON 63.2550(i)]

Waste management unit means the equipment, structure(s), and/or **device(s) used to convey, store, treat, or dispose of wastewater streams or residuals**. Examples of waste management units include wastewater tanks, air flotation units, surface impoundments, containers, oil-water or organic-water separators, individual drain systems, biological wastewater treatment units, waste incinerators, and organic removal devices such as steam and air stripper units, and thin film evaporation units. **If such equipment is being operated as a recovery device, then it is part of a miscellaneous organic chemical manufacturing process and is not a waste management unit.**

Group 1 Wastewater

[MON 63.2550(i)]

Group 1 wastewater stream means a wastewater stream consisting of process wastewater at an existing or new source that meets the criteria for Group 1 status in §63.2485(c) for compounds in Tables 8 and 9 to this subpart and/or a wastewater stream consisting of process wastewater at a new source that meets the criteria for Group 1 status in §63.132(d) for HAP compounds in Table 8 to subpart G of this part 63.

Group 1 Wastewater - Existing



- ⌘ >10,000 ppmw combined T8/T9 HAP at any flow rate if Table 8 >50 ppmw;
- ⌘ >1,000 ppmw combined T8/T9 HAP at flowrate ≥ 1 L/min. if Table 8 >50 ppmw;
- ⌘ >30,000 ppmw soluble T9 HAP with annual load >1 ton/year.

Group 1 Wastewater - New

- ⌘ >10,000 ppmw combined T8/T9 HAP at any flow rate if Table 8 >50 ppmw;
- ⌘ >1,000 ppmw combined T8/T9 HAP at flowrate ≥ 1 L/min. if Table 8 >50 ppmw;
- ⌘ >4,500 ppmw soluble T9 HAP with annual load >1 ton/year.
- ⌘ > 10 ppmw of HON Table 8 HAPs at flowrate > 0.02 L/min

Group 1 Determination



- ⌘ Compute annual average concentration and flowrate for each wastewater stream at POD (can use process knowledge; historical data; or measure w/EPA methods)
- ⌘ For Continuous MCPU - evaluate each stream
- ⌘ For Batch MCPU - sum over all batches and associated family of materials made in same MCPU
- ⌘ Divide total annual HAP mass by total annual wastewater volume

Example Calculation #1

⌘ Benzene (T8) - 25 ppmw avg

⌘ Toluene (T8) - 30 ppmw avg

⌘ Xylene (T8) - 8 ppmw avg

subtotal Table 8 = 63 ppmw (> 50 ppmw)

⌘ Methanol (T9) - 850 ppmw avg

⌘ Toluidine (T9) - 275 ppmw avg

subtotal Table 9 = 1125 ppmw (> 1000 ppmw)

⌘ Total HAP = 1188 ppmw avg @ 2.5 L/min

⌘ **Therefore a Group 1 wastewater stream**

Example Calculation #2

⌘ Benzene (T8) - 15 ppmw

⌘ Toluene (T8) - 20 ppmw

⌘ Xylene (T8) - 8 ppmw

subtotal Table 8 = 43 ppmw (<50 ppmw)

⌘ Methanol (T9) - 1850 ppmw

⌘ Toluidine (T9) - 3000 ppmw

subtotal Table 9 = 4850 ppmw (<30,000 ppmw)

⌘ Total HAP = 4893 ppmw avg @ 2.5 L/min

(7.1 tn/yr load)

⌘ **Therefore a Group 2 wastewater stream**

Example Calculation #3

- ⌘ **POD = batch filtrate going to drain and open sump**
“Family of Materials” for MCPU = Products A and B
Product A = 500 gal and 300 lbs HAP per batch (75 / year)
Product B = 800 gal and 250 lbs HAP per batch (100 / year)
- ⌘ **Total annual HAP mass = 47,500 lbs / year**
Total annual wastewater volume = 117,800 gal / year
- ⌘ **Annual average HAP concentration = 48,459 ppmw**
Annual average wastewater flowrate = 0.85 L/min
- ⌘ **Therefore is Group 1 stream, even if all HAPs are soluble.**

Recovery vs. Treatment



- ⌘ G1/G2 determination is performed after the last recovery device.
- ⌘ Rule allows recovery to achieve G2 status and avoid sealing up sewers and primary WWT or installing a steam stripper
- ⌘ Therefore need to consider all costs associated with compliance and choose most cost-effective option

Steps For Compliance



- ⌘ Group 1/Group 2 determination at POD
- ⌘ Evaluate G1 treatment options, including recovery to eliminate Group 1 streams
- ⌘ Review performance test and compliance demonstration requirements
- ⌘ Review "in-process" equipment for open conveyance situations of "pseudo Group 1"
- ⌘ Vapor suppress all Group 1 streams from POD to inlet of treatment unit

Table 7 - MON Wastewater



⌘ Process wastewater*	HON 63.132 -> 63.148
⌘ Maintenance wastewater*	HON 63.105
⌘ Liquid stream in an open system*	HON 63.149

* except as specified in MON 63.2485

Treatment Options (HON 63.138)



- ⌘ 50/10 ppmw Concentration [63.138(b)(1) / (c)(1)]
- ⌘ Design steam stripper or equivalent [63.138(d)]
- ⌘ Percent mass removal/destruction [63.138(e)]
- ⌘ Required Mass Removal [63.138(f)]
- ⌘ 95% Required Mass Removal for Bio [63.138(g)]
- ⌘ Treatment in RCRA unit [63.138(h)]

- ⌘ 1 Megagram/Year total source mass flow exemption [63.138(i)]

Wastewater Tanks



- ⌘ Must have fixed roof as minimum control. Allowed to heat, treat, or sparge in tank as long as emissions do not increase by more than 5% without such activity.
- ⌘ Control of tank vent dependent upon max. true vapor pressure of HAPs in tank.
- ⌘ See HON Table 10 for size and VP thresholds as well as HON 63.133(a) for floating roof requirements.

Maintenance Wastewater



- ⌘ MON Table 7 points to HON 63.105
- ⌘ Develop a MW plan to minimize emissions created during maintenance activity
- ⌘ Example would be capture of first flush into WMU, followed by flushing to sewer
- ⌘ MW plan is separate from SSM plan, no requirement to document (e.g. checklist) plan is followed during maintenance activity

Halogenated Vents



- ⌘ If have halogenated vent stream from Group 1 wastewater stream (e.g. WMU) or residual that is directed through closed-vent system to combustion device,
- ⌘ Must control HCL, HF, and Cl₂ by 99% or reduce their emission rate to less than 1.0 lb/hr.

Offsite Treatment - Group 1



- ⌘ Offsite treater must certify they will comply with pertinent HAP destruction requirements
- ⌘ Generator can specify in NOCS that Group 1 stream is being disposed via sending to RCRA TSDF as hazardous waste.
- ⌘ Can send stream to POTW if has <50 ppmw Table 8 HAP and can demonstrate less than 5% loss up to activated sludge unit

SOCMI Wastewater NSPS



Subpart YYY

40 CFR Part 60

Proposed Sept.12, 1994

Update - Wastewater NSPS



- ⌘ This is a SOCM I wastewater VOC rule with similar requirements as HON and MON.
- ⌘ Anticipate promulgation date of February or March 2004.
- ⌘ Only applies to mfg. of SOCM I products
- ⌘ Will control streams with ≥ 500 ppmw VOC and 1 L/min (annual average)
- ⌘ VOC defined by volatility potential using Henry Law constant of ≥ 0.1 atm/mole fraction

Wastewater NSPS (cont'd)



- ⌘ Compliance is immediate if you modified your process since Sept. 1994 (NSPS Gen Prov.)
- ⌘ Modification means emission increase from wastewater to atmosphere, but ...
- ⌘ Excludes modifications that are <12.5% of original cost of chemical process unit to account for routine repairs and replacements
- ⌘ Can divide large CPU into smaller, dedicated CPUs before rule effective date in order to reduce impact to only one section or line.