

ENERGY VERWATCH

GHG Reporting Rule Subpart W Amendments 40 CFR 98 Subpart W

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Effective: 2025 Reporting Year

Revisions:

- Must report by facility versus sub-basin or basin now for onshore production and gathering and boosting
- Revised definitions for onshore natural gas processing and gathering and boosting
- Added central oil production sites to gathering and boosting
- Added several new emission sources
- Expanded the sources for several industry segments
- Added measurement and measurement + engineering calculation options for several sources
- Tiered flare destruction and combustion efficiencies based on meeting regulatory measurement requirements.
- Revised the emissions factors of several sources, including equipment leaks, pneumatic devices, and reciprocating compressors.

Business Impact: Greatly Increases in GHG emissions reported including methane which is the basis for the [Waste Emission Charge](#).

Largest Impacts to Reported GHG Emissions:

- Revised flare destruction efficiencies
- Other large releases (>100 kg/hr)
- Methane Slip Natural Gas Fired Reciprocating Internal Combustion Engines and Gas Turbines
- Addition of produced water tanks and open thief hatches on tanks
- Equipment leaks changes

New and Expanded Emissions Sources

Emissions Sources	Calculation Method Options	Pollutants
Nitrogen Removal Units (NRU) (40 CFR 98.233(d))	<ul style="list-style-type: none"> • Continuous emissions monitoring system (CEMS) and volumetric flow rate monitor • Vent meter and composition from a continuous gas analyzer or quarterly samples • Inlet or outlet gas flow rate and continuous gas analyzer or quarterly samples • Simulation software that uses Peng-Robinson equation of state and speciates CO₂ and CH₄ 	CH ₄
Acid Gas Removal (40 CFR 98.233(d))	Same as before and NRU – just added CH ₄	CO ₂ & CH ₄
Produced Water Tanks (40 CFR 98.233(j))	<ul style="list-style-type: none"> • Simulation software that uses Peng-Robinson equation of state, models flashing emissions, and speciates CH₄ and CO₂ • Assume all the CH₄ and CO₂ in solution upstream of the tank (well head, separator, non-separation equipment) is emitted based on a sample of the produced water or hydrocarbon liquid composition assuming oil entrainment of 1% • Emission Factor and annual flowrate of produced water where EF_{CH₄} = 0.0015 for pressure ≤50 psi, 0.0142 for pressure >50 and ≤250, 0.0508 for pressure >250 metric tones CH₄/1,000 bbls of produced water. 	CH ₄
Open Tank Thief Hatches (40 CFR 98.233(j)(7))	<ul style="list-style-type: none"> • Requires monitoring of thief hatch opening using either an open/closed sensor, tank pressure sensor, or audio, visual, and olfactory (AVO) inspections per 40 CFR 60 Subpart OOOOb or c or at least annually. • Must assume that tank emissions are vented during the entire time the thief hatch is open – for an AVO consider it open from the first of the year or last inspection in the year until closed. 	CO ₂ & CH ₄

Emissions Sources	Calculation Method Options	Pollutants
Other Large Release Events (40 CFR 98.233(y))	<ul style="list-style-type: none"> Any source that emits >100 kg/hr CH₄ Estimate the volume of gas released Start time based on monitored parameters and engineering principles, most recent survey, or 91 days before the event is identified End time based on the confirmed repair or cessation Composition based on measurement data or combination of process knowledge, engineering estimates, and best available measurement 	CH ₄
Methane Slip from Natural Gas Fired Reciprocating Internal Combustion Engines and Gas Turbines (40 CFR 98.233(z)(4))	<ul style="list-style-type: none"> Performance test for CH₄ Manufacturer emission factors for CH₄, Emission factors from Table W-7 (kg CH₄/mmBtu): 2-stroke lean burn – 0.658, 4-stroke lean burn – 0.522, 4-stroke rich burn – 0.045, and gas turbine – 0.004 (much higher than in Table C-2 of 0.001) 	CH ₄
Crankcase Venting from Reciprocating Internal Combustion Engines >130 hp (40 CFR 98.233(ee))	<ul style="list-style-type: none"> Measure the volumetric flow from the crankcase vent at standard conditions within 10% of 100% peak load Emission Factor of 0.083 kg/hr for onshore production and gathering and boosting or 0.11 kg/hr for all other segments 	CH ₄
Drilling Mud Degassing (40 CFR 98.233(dd))	<ul style="list-style-type: none"> Measurements from at least one representative well in each sub-basin and within the equivalent strategic interval for average mud rate, total time the drilling mud is circulated, average concentration of natural gas in the drilling mud as measured by the gas trap (ppm), and measured mole fraction of CH₄ in the natural gas entrained in the drilling mud. Emission factors of EFCH₄ = Water-based = 0.2605, Oil-based = 0.0586, and synthetic = 0.0586 of metric tonnes of CH₄/day of drilling multiplied by the drilling days and by a ratio of the mole % of CH₄ in the gas versus the factor basis of 83.85% 	CH ₄

Expanded Sources for Industry Segments

Industry Segment	New Sources	
Onshore Production	Blowdown vents Produced water tanks Other large release Crankcase venting	Nitrogen removal units Open thief hatches Methane slip from combustion Mud degassing
Gathering and Boosting	Nitrogen removal units Open thief hatches Methane slip from combustion	Produced water tanks Other large release Crankcase venting
Natural Gas Processing	Pneumatic devices Nitrogen removal units Open thief hatches Crankcase venting	Hydrocarbon liquid storage tanks Produced water tanks Other large release
Transmissions Compression	Dehydrators Crankcase venting	Other large release
Underground Storage	Dehydrators Condensate storage tanks Crankcase venting	Blowdown vents Other large release
LNG Storage	Acid gas removal Other large release	Blowdown vents Crankcase venting
LNG Import/ Export	Acid gas removal	Nitrogen removal units

Industry Segment	New Sources	
	Other large release	Crankcase venting
NG Distribution	Pneumatic devices Other large release Crankcase venting	Blowdown vents Methane slip from combustion
Transmission Pipeline	Equipment leaks	Other large release
Offshore Production	Other large release	

New and Revised Calculation Options

Emissions Source	New and Revised Calculation Options	Pollutants
Flares (40 CFR 98.233(n))	<ul style="list-style-type: none"> Revised - Flare destruction and combustion efficiencies based on compliance with NESHAP CC for 98%/96.5%, NSPS OOOOb for 95%/93.5%, or for all other flares 92%/90.5% Associated gas flaring now under 40 CFR 98.233(n). New - Requirement to continuously monitor the pilot flame or combustion flame or visually inspect at least monthly. Revised - Flow volume options include measurement via flow meter, continuous parameter monitoring or engineering calculations Revised - Compositions options include measurement via continuous gas composition analyzer, annual compositional analysis, or engineering calculations 	CH ₄ , CO ₂ , & N ₂ O
Natural Gas Pneumatic Device Venting (40 CFR 98.233(a))	<ul style="list-style-type: none"> New - Measure supplied gas to the devices with continuous flow meter. New - Measure the vent gas from each device with a high-flow samplers or calibrated bag. New - Inspect for malfunctions with an optical gas imaging (OGI) camera or infrared laser beam for 2 minutes or malfunctions and use malfunctioning and not malfunction factors. New - Provisions for routing to a control device. Revised - Population-based emission factors by industry segment. 	CH ₄ & CO ₂
Natural Gas Pneumatic Pump Venting (40 CFR 98.233(c))	<ul style="list-style-type: none"> New - Directly measure supplied gas to the pumps with continuous flow meter. New - Measure the vent gas from each pump with a high-flow sampler or calibrated bag. New - Provisions for routing to a control device. 	CH ₄ & CO ₂
Equipment Leak Surveys (40 CFR 98.233(q) and (r))	<ul style="list-style-type: none"> Revised - Must use survey results from 40 CFR 60 Subpart OOOOb and OOOOc Revised – Revised Leak Factor Tables W-2-6 raising most factors (now by industry and method of detection) and must multiply the mass CO₂ and CH₄ emissions by an adjustment factor for undetected leaks, k, where =1.25 for OGI, laser beam illuminated instruments, and acoustic; 1.55 for Method 21 at 10,000 ppm; and 1.27 for Method 21 at 500 ppm. New - Leak measurement method with direct measurement using a high-flow sampler or calibrated bag and adjustment factor, k, for undetected leaks. New – Facility specific component level leak factors my measuring 50 leaks of a given component type and detection method updated annually. Revised – Population based calculations and factors in Table W-1 to be based upon for major equipment and industry sector. 	CH ₄ & CO ₂
Gas-liquid Separator Dump Valves (40 CFR 98.233(j)(6))	<ul style="list-style-type: none"> Revised – Now includes uncontrolled not just CH₄ but also CO₂ emissions from atmospheric storage tanks (both hydrocarbon and produced water) 	CH ₄ & CO ₂

Emissions Source	New and Revised Calculation Options	Pollutants
	<p>with dump valves on an associated gas-liquid separator that did not close properly.</p> <ul style="list-style-type: none"> Revised – Duration of venting based on either parametric monitoring of the dump valve stuck open or partially closed, audio, visual, and olfactory inspections at least annually of whether the valve is stuck open or partially open. 	
<p>Reciprocating Compressor Venting (40 CFR 98.233(p))</p>	<ul style="list-style-type: none"> Revised – Acoustic leak detection only applies to through valve leakage and not screening a manifolded group. New – Onshore production and gathering and boosting method based on the measurements of the rod packing following 40 CFR 60.5385b or c (required if subject to the requirements) Revised – Higher emission factors if measurements are not taken applied to the time the compressor is in operating mode of EF CH₄ = 2.13 x 10⁵ scf/yr (versus 9.48 x 10³) and EF CO₂ = 1.18 x 10⁴ scf/yr (versus 5.27 x 10²) 	<p>CH₄ & CO₂</p>
<p>Centrifugal Compressor Venting (40 CFR 98.233(o))</p>	<ul style="list-style-type: none"> Revised – Acoustic leak detection only applies to through valve leakage and not screening a manifolded group. Revised - As found measurements for standby-pressurized mode requires volumetric measurement of the following sources blowdown valve leakage, wet seal degassing following, dry seal vents. Revised – Measurements can be made using a vane anemometer or permanent flow meter, a calibrated bag, or a high-flow sampler. Revised – Dry seals can be screened with an OGI camera, Method 21 instrument, or infrared laser beam illumination instrument and emissions considered 0 if no emissions are found. 	<p>CH₄ & CO₂</p>

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