

Industrial Wastewater Treatment Sources



Greenhouse Gas Reporting Program

Under the Greenhouse Gas Reporting Program (GHGRP), owners or operators of certain facilities that use anaerobic processes to treat industrial wastewater and wastewater treatment sludge must report emissions from processes present at the facility if aggregate annual greenhouse gas (GHG) emissions are equal to or more than 25,000 metric tons of carbon dioxide equivalent (CO_{2e}). Owners or operators are required to collect wastewater characterization and biogas emissions data, calculate GHG emissions, and follow the specified procedures for quality assurance, missing data, recordkeeping, and reporting.

How Is This Source Category Defined?

The industrial wastewater treatment source category consists of anaerobic processes used to treat industrial wastewater and wastewater treatment sludge at facilities that perform the following operations:

- Pulp and paper manufacturing;
- Food processing (fruits, vegetables, meat, and poultry processing only);
- Ethanol production; and
- Petroleum refining.

The category does *not* include anaerobic processes used to treat wastewater and wastewater treatment sludge at other industrial facilities. It also does not include emissions from:

- Municipal wastewater treatment plants;
- Separate treatment of sanitary wastewater at industrial facilities;
- Oil/water separators; or
- Aerobic and anoxic treatment of industrial wastewater.

Anaerobic processes use microorganisms to degrade organic matter in wastewater, wastewater treatment sludge, or other material in the absence of oxygen, resulting in the generation of carbon dioxide and methane (CH₄). The anaerobic treatment processes included in this category are:

- Anaerobic wastewater treatment reactors;
- Anaerobic wastewater treatment lagoons; and
- Anaerobic sludge digesters.

What GHGs Must Be Reported?

Facilities that are subject to the rule must report:

- Annual mass of CH₄ *generated* by each anaerobic wastewater treatment reactor and each anaerobic wastewater treatment lagoon;
- Annual mass of CH₄ *recovered* from each anaerobic treatment process (reactor, lagoon, and sludge digester)
- Annual mass of CH₄ *emitted* from each anaerobic treatment process (reactor, lagoon, and sludge digester).

In addition, each facility must report GHG emissions for any other source categories for which calculation methods are provided in other subparts of the rule, as applicable.

How Must GHG Emissions Be Calculated?

The mass of CH₄ generated, recovered, and emitted must be calculated using the following inputs:

- Measured wastewater flow into each anaerobic wastewater treatment process;
- Measured concentration of chemical oxygen demand (COD) or biochemical oxygen demand (BOD₅) in wastewater flow into each anaerobic wastewater treatment process;
- Measured flow of biogas recovered from each anaerobic process;
- Measured CH₄ concentration of the biogas recovered from each anaerobic process;
- Appropriate values for methane producing potential, methane conversion factor, biogas collection efficiency, biogas leakage, and biogas destruction device destruction efficiency; and
- Operating time per year.

For anaerobic wastewater treatment processes, each week that the process is operating, facilities must collect 24-hour composite samples of the wastewater flowing into the process and analyze it for COD or BOD₅ concentration. They must measure the flow rate of wastewater for the same 24-hour period for which they collect samples. Using these measurements and appropriate values for methane producing potential and methane conversion factor, facilities must then calculate the CH₄ generated by each anaerobic wastewater treatment process during the week. Weekly values must be summed to calculate the annual mass of CH₄ generated.

For all anaerobic treatment processes (reactors, lagoons, and sludge digesters) from which some biogas is recovered, facilities must calculate the annual quantity of CH₄ recovered based on continuous monitoring of the biogas flow rate; continuous or weekly monitoring of CH₄ concentration, temperature, pressure, and moisture content; and appropriate biogas collection efficiencies provided in the regulation. They must also calculate the annual quantity of CH₄ emitted, based on appropriate values for biogas leakage and biogas destruction device destruction efficiency. CH₄ destruction efficiency must be based on either the manufacturer's specified efficiency or 99 percent, whichever is less.

When Must Reporting Begin?

Industrial wastewater facilities subject to subpart II must begin monitoring GHG emissions on January 1, 2011 in accordance with the methods specified in the subpart. The first reports are due to EPA on March 31, 2012 and annually thereafter.

What Information Must Be Reported?

In addition to the information required by the General Provisions at 40 CFR 98.3(c), each facility must report the following:

- A description or diagram of the industrial wastewater treatment system, identifying the processes used to treat industrial wastewater and industrial wastewater treatment sludge. The anaerobic processes must be identified as:
 - Anaerobic reactor;
 - Anaerobic deep lagoon (depth more than 2 meters);
 - Anaerobic shallow lagoon (depth less than 2 meters); or
 - Anaerobic sludge digester.

- For each anaerobic wastewater treatment process (reactor or lagoon), facilities must report:
 - Weekly average COD or BOD₅ concentration of wastewater entering each anaerobic wastewater treatment process, for each week the anaerobic process was operated.
 - Volume of wastewater entering each anaerobic wastewater treatment process for each week the anaerobic process was operated.
 - Maximum CH₄ production potential (B₀) used to calculate CH₄ generation.
 - Methane conversion factor (MCF) used to calculate CH₄ generation.
 - Annual mass of CH₄ generated by each anaerobic wastewater treatment process.

- For each anaerobic wastewater treatment process (reactor or lagoon) and anaerobic sludge digester, facilities must report:
 - Annual quantity of CH₄ recovered from the anaerobic treatment processes.
 - Cumulative volumetric biogas flow for each week that biogas is collected for destruction.
 - Weekly average CH₄ concentration for each week that biogas is collected for destruction.
 - Weekly average temperature for each week at which flow is measured for biogas collected for destruction, or statement that temperature is incorporated into monitoring equipment internal calculations.
 - Whether flow was measured on a wet or dry basis, whether CH₄ concentration was measured on a wet or dry basis, and if required, weekly average moisture content for each week at which flow is measured for biogas collected for destruction, or statement that moisture content is incorporated into monitoring equipment internal calculations.
 - Weekly average pressure for each week that flow is measured for biogas collected for destruction, or statement that pressure is incorporated into monitoring equipment internal calculations.
 - CH₄ collection efficiency used to calculate biogas recovery.
 - Whether destruction occurs at the facility or off-site. If destruction occurs at the facility, facilities must also report whether a back-up destruction device is present, the annual operating hours for the primary destruction device, the annual operating hours for the back-up destruction device (if present), the destruction efficiency for the primary destruction device, and the destruction efficiency for the backup destruction device (if present).
 - Annual quantity of CH₄ emitted from the process.

- The total mass of CH₄ emitted from all anaerobic processes, including anaerobic processes from which biogas is not recovered and anaerobic processes from which some biogas is recovered.

For More Information

This document is provided solely for informational purposes. It does not provide legal advice, have legally binding effect, or expressly or implicitly create, expand, or limit any legal rights, obligations, responsibilities, expectations, or benefits in regard to any person. The series of information sheets is intended to assist reporting facilities/owners in understanding key provisions of the final rule.

Visit EPA's Web site (www.epa.gov/climatechange/emissions/ghgrulemaking.html) for more information, including all rulemakings related to the Greenhouse Gas Reporting Program, additional information sheets on specific industries, the schedule for training sessions, and other documents and tools. For questions that cannot be answered through the Web site, please contact us at: ghgmrr@epa.gov.