G_{CH4} = Modeled methane generation rate in reporting year from Equation HH–1 of this subpart or Equation TT–1 of subpart TT of this part, as applicable, except for application with Equation HH–6 of this subpart (metric tons CH_4). For application with Equation HH–6 of this subpart, the greater of the modeled methane generation rate in reporting year from Equation HH–1 of this subpart or Equation TT–1 of this part, as applicable, and the quantity of recovered CH_4 from Equation HH–4 of this subpart (metric tons CH_4).

CE = Collection efficiency estimated at landfill, taking into account system coverage, operation, and cover system materials from Table HH–3 of this subpart. If area by soil cover type information is not available, use default value of 0.75 (CE4 in table HH–3 of this subpart) for all areas under active influence of the collection system.

N = Number of landfill gas measurement locations (associated with a destruction device or gas sent off-site). If a single monitoring location is used to monitor volumetric flow and CH_4 concentration of the recovered gas sent to one or multiple destruction devices, then N=1.

R_n = Quantity of recovered CH_4 from Equation HH–4 of this subpart for the nth measurement location (metric tons).

$f_{Rec,n}$ = Fraction of hours the recovery system associated with the nth measurement location was operating (annual operating hours/8760 hours per year or annual operating hours/8784 hours per year for a leap year).

[78 FR 71971, Nov. 29, 2013]

Subpart II—Industrial Wastewater Treatment

SOURCE: 75 FR 39767, July 12, 2010, unless otherwise noted.

§ 98.350   Definition of source category.

(a) This source category consists of anaerobic processes used to treat industrial wastewater and industrial wastewater treatment sludge at facilities that perform the operations listed in this paragraph.

(1) Pulp and paper manufacturing.

(2) Food processing.

(3) Ethanol production.

(4) Petroleum refining.

(b) An *anaerobic process* is a procedure in which organic matter in wastewater, wastewater treatment sludge, or other material is degraded by micro-organisms in the absence of oxygen, resulting in the generation of CO_2 and CH_4.

This source category consists of the following: anaerobic reactors, anaerobic lagoons, anaerobic sludge digesters, and biogas destruction devices (for example, burners, boilers, turbines, flares, or other devices).

(1) An *anaerobic reactor* is an enclosed vessel used for anaerobic wastewater treatment (*e.g.,* upflow anaerobic sludge blanket, fixed film).

(2) An *anaerobic sludge digester* is an enclosed vessel in which wastewater treatment sludge is degraded anaerobically.

(3) An *anaerobic lagoon* is a lined or unlined earthen basin used for wastewater treatment, in which oxygen is absent throughout the depth of the basin, except for a shallow surface zone. Anaerobic lagoons are not equipped with surface aerators. Anaerobic lagoons are classified as deep (depth more than 2 meters) or shallow (depth less than 2 meters).

(c) This source category does not include municipal wastewater treatment plants or separate treatment of sanitary wastewater at industrial sites.

[75 FR 39767, July 12, 2010, as amended at 76 FR 73903, Nov. 29, 2011]

§ 98.351   Reporting threshold.

You must report GHG emissions under this subpart if your facility meets all of the conditions under paragraphs (a) or (b) of this section:

(a) *Petroleum refineries and pulp and paper manufacturing.*

(1) The facility is subject to reporting under subpart Y of this part (Petroleum Refineries) or subpart AA of this part (Pulp and Paper Manufacturing).

(2) The facility meets the requirements of either § 98.2(a)(1) or (2).

(3) The facility operates an anaerobic process to treat industrial wastewater and/or industrial wastewater treatment sludge.

(b) *Ethanol production and food processing facilities.*

(1) The facility performs an ethanol production or food processing operation, as defined in § 98.358 of this subpart.

(2) The facility meets the requirements of § 98.2(a)(2).

(3) The facility operates an anaerobic process to treat industrial wastewater

and/or industrial wastewater treatment sludge.

§ 98.352 GHGs to report.

(a) You must report CH_4 generation, CH_4 emissions, and CH_4 recovered from treatment of industrial wastewater at each anaerobic lagoon and anaerobic reactor.

(b) You must report CH_4 emissions and CH_4 recovered from each anaerobic sludge digester.

(c) You must report CH_4 emissions and CH_4 destruction resulting from each biogas collection and biogas destruction device.

(d) You must report under subpart C of this part (General Stationary Fuel Combustion Sources) the emissions of CO_2, CH_4, and N_2O from each stationary combustion unit associated with the biogas destruction device, if present, by following the requirements of subpart C of this part.

[75 FR 39767, July 12, 2010, as amended at 76 FR 73903, Nov. 29, 2011]

§ 98.353 Calculating GHG emissions.

(a) For each anaerobic reactor and anaerobic lagoon, estimate the annual mass of CH_4 generated according to the applicable requirements in paragraphs (a)(1) through (a)(2) of this section.

(1) If you measure the concentration of organic material entering the anaerobic reactors or anaerobic lagoon using methods for the determination of chemical oxygen demand (COD), then estimate annual mass of CH_4 generated using Equation II–1 of this section.

$$CH_4G_n = \sum_{w=1}^{52}\left[Flow_w * COD_w * B_o * MCF * 0.001\right] \quad \text{(Eq. II-1)}$$

Where:

CH_4G_n = Annual mass CH_4 generated from the nth anaerobic wastewater treatment process (metric tons).

n = Index for processes at the facility, used in Equation II–7.

w = Index for weekly measurement period.

$Flow_w$ = Volume of wastewater sent to an anaerobic wastewater treatment process in week w (m^3/week), measured as specified in § 98.354(d).

COD_w = Average weekly concentration of chemical oxygen demand of wastewater entering an anaerobic wastewater treatment process (for week w)(kg/m^3), measured as specified in § 98.354(b) and (c).

B_0 = Maximum CH_4 producing potential of wastewater (kg CH_4/kg COD), use the value 0.25.

MCF = CH_4 conversion factor, based on relevant values in Table II–1 of this subpart.

0.001 = Conversion factor from kg to metric tons.

(2) If you measure the concentration of organic material entering an anaerobic reactor or anaerobic lagoon using methods for the determination of 5-day biochemical oxygen demand (BOD_5), then estimate annual mass of CH_4 generated using Equation II–2 of this section.

$$CH_4G_n = \sum_{w=1}^{52}\left[Flow_w * BOD_{5,w} * B_o * MCF * 0.001\right] \quad \text{(Eq. II-2)}$$

Where:

CH_4G_n = Annual mass of CH_4 generated from the anaerobic wastewater treatment process (metric tons).

n = Index for processes at the facility, used in Equation II–7.

w = Index for weekly measurement period.

$Flow_w$ = Volume of wastewater sent to an anaerobic wastewater treatment process in week w(m^3/week), measured as specified in § 98.354(d).

$BOD_{5,w}$ = Average weekly concentration of 5-day biochemical oxygen demand of wastewater entering an anaerobic wastewater treatment process for week w(kg/m^3), measured as specified in § 98.354(b) and (c).