Carbon Credits (Carbon Farming Initiative—Domestic, Commercial and Industrial Wastewater) Methodology Determination 2015

I, Greg Hunt, Minister for the Environment, make the following determination.

Dated 26 March 2015

Greg Hunt

Greg Hunt
Minister for the Environment

OPC60652 - B

Contents

Part 1—Preliminary

1 Name

This is the *Carbon Credits (Carbon Farming Initiative—Domestic, Commercial and Industrial Wastewater) Methodology Determination 2015*.

2 Commencement

This determination commences on the day after it is registered.

3 Authority

This determination is made under subsection 106(1) of the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

4 Duration

This determination remains in force for the period that:

(a) begins when the determination commences; and

(b) ends on the day before this determination would otherwise be repealed under subsection 50(1) of the *Legislative Instruments Act 2003*.

5 Definitions

In this determination:

Act means the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

anaerobic digester means a system that:

(a) is a covered lagoon or an engineered biodigester; and

(b) consists of:

(i) one or more closed units designed to promote anaerobic digestion; and

(ii) a biogas collection system; and

(iii) any equipment associated with the transfer of biogas to a combustion device.

anaerobic digestion means a biological process in which organic matter is broken down by microorganisms in the absence of oxygen.

appropriate measuring requirements has the meaning given by subsection 45(3).

biogas means a mixture of gases including methane that is generated as a result of anaerobic digestion of organic material in wastewater.

biogas collection efficiency means the percentage of biogas generated in an anaerobic digester that is sent to a combustion device.

chemical oxygen demand, or ***COD***, means the total material available for chemical oxidation (both biodegradable and non-biodegradable).

combustion device means:

(a) a boiler, or an internal combustion engine, that is operated in accordance with the manufacturer's instructions; or

(b) a flare that has a monitoring and control system and is operated in accordance with the manufacturer's instructions; or

(c) a device:

(i) that combusts biogas with a destruction efficiency of at least 98%; and

(ii) that is operated in accordance with the manufacturer's instructions; and

(iii) the combustion process of which is controlled using a monitoring and control system.

covered lagoon means a lagoon that:

(a) is an existing anaerobic lagoon (the ***uncovered lagoon***) that is covered to create a closed unit; and

(b) does not contain any heating or stirring features that were not present in the uncovered lagoon.

declaration day, for a wastewater project, has the meaning given by subsection 34(4).

deep open anaerobic lagoon means an open lagoon:

(a) with a depth of more than 2 metres; and

(b) in which the biological treatment of biomass or other organic matter occurs through anaerobic digestion; and

(c) from which the resulting methane emissions are not captured and are instead vented into the atmosphere.

digestate means the residual solids or semisolids stream that:

(a) remains in an anaerobic digester following anaerobic treatment; and

(b) must be removed periodically.

domestic or commercial wastewater has the meaning given by subsection 5.23(2) of the NGER (Measurement) Determination.

effluent, in relation to a deep open anaerobic lagoon, means the liquid outflow from the lagoon.

eligible wastewater, in relation to a wastewater project, means:

(a) domestic or commercial wastewater; or

(b) industrial wastewater;

from an historical source for the project.

engineered biodigester means a purpose-built closed vessel that:

(a) is for the biological treatment of organic matter through anaerobic digestion; and

(b) has heating and stirring features; and

(c) is not a covered lagoon.

Note: Examples of engineered biodigesters include the following:
(a) plug-flow reactors;
(b) continuously stirred tank reactors;
(c) fixed film digesters;
(d) up-flow anaerobic sludge blanket digesters.

historical period of sampling means the period during which sampling was undertaken from the operation of a deep open anaerobic lagoon for the purposes of working out baseline emissions for a wastewater project using Subdivision B of Division 3 of Part 4, which:

(a) was 1 year or 10 consecutive days; and
(b) started no earlier than 18 months before the day on which an application under section 22 of the Act is made in relation to the project.

Note: The period must be the same for all sampling undertaken for the purposes of using Subdivision B of Division 3 of Part 4.

historical source, for a wastewater project, means a source from which:

(a) domestic or commercial wastewater; or
(b) industrial wastewater;

entered a lagoon being replaced in the project during the 12-month period ending on the day before an application under section 22 of the Act is made in relation to the project.

industrial wastewater has the meaning given by subsection 5.40(2) of the NGER (Measurement) Determination.

ineligible material, in relation to a wastewater project, means any organic material treated in an anaerobic digester installed as part of the project that is not eligible wastewater for the project.

influent, in relation to a deep open anaerobic lagoon, means:

(a) domestic or commercial wastewater; or
(b) industrial wastewater;

entering the lagoon.

major venting event: a ***major venting event*** occurs when biogas in the storage capacity of an anaerobic digester is released to the atmosphere in a way that does not represent the proper operation of the anaerobic digester, including:

(a) when the biogas is released intentionally (for example, for safety or maintenance purposes); and
(b) when the biogas is released unintentionally (for example, as the result of a system failure).

monitoring and control system, for a flare or other device, means a system that consists of:

(a) a monitoring system that detects combustion and monitors if the combustion is operating at the manufacturer's specifications for the complete combustion of methane; and

(b) an associated control system that shuts down biogas flow to the flare or other device when the flare or device is not operating at the manufacturer's specifications for the complete combustion of methane.

Note: An example of a monitoring and control system for a flare is a flare management system that incorporates a UV detection sensor.

monitoring requirements means the requirements set out in section 45.

NGA Factors document has the meaning given by subsection 34(4).

NGER (Measurement) Determination means the *National Greenhouse and Energy Reporting (Measurement) Determination 2008*.

NGER Regulations means the *National Greenhouse and Energy Reporting Regulations 2008*.

non-monitored period has the meaning given by subsection 46(1).

sludge means the solid or semisolid material that:

(a) accumulates at the bottom of an anaerobic lagoon; and

(b) is periodically cleaned out.

source, of wastewater, means the point of generation of the wastewater, which may be expressed as a physical location where the wastewater generation occurs or a specific activity or facility that generates the wastewater.

6 References to factors and parameters from external sources

(1) If a calculation in this determination includes a factor or parameter that is defined or calculated by reference to another instrument or writing, the factor or parameter to be used for a reporting period is the factor or parameter referred to in, or calculated by reference to, the instrument or writing as in force at the end of the reporting period.

(2) Subsection (1) does not apply if:

(a) this determination specifies otherwise; or

(b) it is not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

Part 2—Wastewater projects

7 Wastewater projects

(1) For paragraph 106(1)(a) of the Act, this determination applies to an offsets project that installs anaerobic digesters to replace deep open anaerobic lagoons.

(2) A project covered by subsection (1) is a ***wastewater project***.

Part 3—Project requirements

8 Operation of this Part

For paragraph 106(1)(b) of the Act, this Part sets out requirements that must be met for a wastewater project to be an eligible offsets project.

9 Lagoons to be replaced

(1) A lagoon that is to be replaced as part of the project must, before 24 April 2014:
  (a) have existed; and
  (b) been treating:
    (i) domestic or commercial wastewater; or
    (ii) industrial wastewater;

(2) The lagoon must only treat either, or both, of the following:
  (a) domestic or commercial wastewater;
  (b) industrial wastewater.

(3) The lagoon must be a deep open anaerobic lagoon.

Note: For ***deep open anaerobic lagoon***, see section 5.

(4) The application made under section 22 of the Act in relation to the project must include evidence of the historical sources of wastewater for the project.

10 Anaerobic digesters

An anaerobic digester that is installed as part of the project must capture biogas that is generated from the treatment of wastewater in the digester.

11 Combustion devices

The biogas captured by the anaerobic digester must be combusted with a combustion device.

Part 4—Net abatement amounts

Division 1—Operation of this Part

12 Operation of this Part

(1) For paragraph 106(1)(c) of the Act, this Part specifies the method for working out the carbon dioxide equivalent net abatement amount for a reporting period for a wastewater project that is an eligible offsets project.

(2) In this Part, a reference to an anaerobic digester is a reference to an anaerobic digester that is installed as part of the project.

13 Overview of gases accounted for in abatement calculations

The following table provides an overview of the greenhouse gas abatement and emissions that are relevant to working out the carbon dioxide equivalent net abatement amount for a wastewater project.

Greenhouse gases and emissions sources

Item	Relevant calculation	Emissions source	Greenhouse gas
1	Baseline emissions	Treatment of eligible wastewater for the project in a deep open anaerobic lagoon	Methane (CH_4)
2	Project emissions	Fuel consumption	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
3	Project emissions	Electricity consumption	Carbon dioxide (CO_2) Methane (CH_4) Nitrous oxide (N_2O)
4	Project emissions	Emissions from anaerobic digester leakage or venting events	Methane (CH_4)
5	Project emissions	Emissions from the combustion of biogas	Methane (CH_4) Nitrous oxide (N_2O)
6	Project emissions	Emissions from the end management of digestate	Methane (CH_4) Nitrous oxide (N_2O)

Division 2—Method for calculating net abatement amount

14 Summary

The carbon dioxide equivalent net abatement amount for the reporting period is worked out by calculating baseline emissions and then subtracting project emissions from that result.

15 Net abatement amount

(1) The carbon dioxide equivalent net abatement amount for the reporting period is worked out using the formula (***equation 1***):

$$A = E_B - E_P$$

where:

A means the carbon dioxide equivalent net abatement amount for the reporting period, in tonnes CO_2-e.

$\boldsymbol{E_B}$ means the baseline emissions for the reporting period, in tonnes CO_2-e, worked out in accordance with section 17.

$\boldsymbol{E_P}$ means the project emissions for the reporting period, in tonnes CO_2-e, worked out using equation 11.

(2) However, if the amount worked out under subsection (1) is less than zero, the carbon dioxide equivalent net abatement amount for the reporting period is taken to be zero.

Division 3—Baseline emissions

Subdivision A—Preliminary

16 Summary

The baseline emissions for the reporting period are the emissions that would have resulted if eligible wastewater for the project treated during the reporting period in anaerobic digesters had been treated in a deep open anaerobic lagoon instead.

17 Baseline emissions

(1) The baseline emissions for the reporting period are worked out in accordance with this section.

(2) If sampling was undertaken from the operation of the relevant deep open anaerobic lagoon for the purposes of working out baseline emissions, the project proponent may choose to work out baseline emissions using either Subdivision B or C.

Note: The samples will only be used if the project proponent uses Subdivision B.

(3) If sampling was not undertaken from the operation of the relevant deep open anaerobic lagoon for the purposes of working out baseline emissions, the project proponent must work out baseline emissions using Subdivision C.

(4) Whichever of Subdivision B or C is used for working out baseline emissions for the first reporting period for the project, the same Subdivision must be used for working out baseline emissions for subsequent reporting periods for the project, subject to subsection 24(2).

Note: There are consequences if certain parameters are not determined correctly: see section 24.

Subdivision B—Calculating baseline emissions using sampling from the operation of a deep open anaerobic lagoon

18 Calculating baseline emissions using sampling from a deep open anaerobic lagoon

The baseline emissions for the reporting period are worked out using the following formula (***equation 2***):

$$E_B = COD_{In} \times \left(1 - F_{Eff} - F_{Slu}\right) \times UF \times MCF \times EF$$

where:

E_B means the baseline emissions for the reporting period, in tonnes CO_2-e.

COD_{In} means the amount of chemical oxygen demand in the eligible wastewater for the project entering anaerobic digesters during the reporting period, in tonnes, worked out in accordance with the monitoring requirements.

F_{Eff} means the fraction of COD_{In} that would, in the relevant deep open anaerobic lagoon, have been removed in effluent and not undergone treatment in the lagoon to produce methane, worked out using equation 3.

F_{Slu} means the fraction of COD_{In} that would, in the relevant deep open anaerobic lagoon, have been in sludge and not undergone treatment in the lagoon to produce methane, worked out in accordance with section 22.

UF means the conservativeness factor, which is 0.89.

MCF means the default methane correction factor for deep anaerobic lagoons, set out in Part 5.3 of the NGER (Measurement) Determination.

EF means the default methane emission factor for wastewater, in tonnes CO_2-e per tonne COD, set out in Part 5.3 of the NGER (Measurement) Determination.

19 Fraction of chemical oxygen demand in influent removed in effluent

The fraction of COD_{In} (within the meaning of section 18) that would, in a deep open anaerobic lagoon, have been removed in effluent and not undergone treatment in the lagoon to produce methane, is worked out using the formula (***equation 3***):

$$F_{Eff} = \left(\frac{COD_{Eff,DAL}}{COD_{In,DAL}} \right) \times AF$$

where:

F_{Eff} means the fraction of COD_{In} (within the meaning of section 18) that would, in the relevant deep open anaerobic lagoon, have been removed in effluent and not undergone treatment in the lagoon to produce methane.

$COD_{Eff,DAL}$ means the amount of chemical oxygen demand in effluent leaving the relevant deep open anaerobic lagoon in the historical period of sampling, in tonnes, worked out in accordance with section 20.

$COD_{In,DAL}$ means the amount of chemical oxygen demand in influent entering the relevant deep open anaerobic lagoon in the historical period of sampling, in tonnes, worked out in accordance with section 21.

AF means the adjustment factor based on the historical period of sampling that is used, which is:

(a) if the historical period of sampling is 1 year—1; or
(b) if the historical period of sampling is 10 consecutive days—1.12.

20 Chemical oxygen demand in effluent leaving a deep open anaerobic lagoon

(1) The amount of chemical oxygen demand in effluent leaving a deep open anaerobic lagoon in a historical period of sampling, in tonnes, is worked out in accordance with this section.

(2) For effluent that is domestic or commercial wastewater, the amount is equivalent to parameter COD_{effz} calculated under Division 5.3.3 of the NGER (Measurement) Determination, with the following modifications:

(a) paragraphs 5.28(1)(c) and (2)(c) of that Determination are taken to be omitted;

(b) if the historical period of sampling is 10 consecutive days—the reference to a monthly basis in section 5.29 of that Determination is taken to be a reference to a daily basis;

(c) parameter COD_{effz} applies as if:

(i) a reference to "the sub-facility during the reporting year" were a reference to "the relevant deep open anaerobic lagoon in the historical period of sampling"; and

(ii) a reference to "facility operating data" were a reference to "data about the operation of the lagoon".

(3) For effluent that is industrial wastewater, the amount is equivalent to parameter COD_{eff} calculated under Division 5.4.3 of the NGER (Measurement) Determination, with the following modifications:

(a) paragraphs 5.45(1)(c) and (2)(c) of that Determination are taken to be omitted;

(b) if the historical period of sampling is 10 consecutive days—the reference to a monthly basis in section 5.46 of that Determination is taken to be a reference to a daily basis;

(c) parameter COD_{eff} applies as if a reference to "the plant during the year" were a reference to "the relevant deep open anaerobic lagoon in the historical period of sampling".

21 Chemical oxygen demand in influent entering a deep open anaerobic lagoon

(1) The amount of chemical oxygen demand in influent entering a deep open anaerobic lagoon in a historical period of sampling, in tonnes, is worked out in accordance with this section.

(2) For influent that is domestic or commercial wastewater, the amount is equivalent to parameter COD_{wz} calculated under Division 5.3.3 of the NGER (Measurement) Determination, with the following modifications:

(a) paragraphs 5.28(1)(c) and (2)(c) of that Determination are taken to be omitted;

(b) if the historical period of sampling is 10 consecutive days—the reference to a monthly basis in section 5.29 of that Determination is taken to be a reference to a daily basis;

(c) parameter COD_{wz} applies as if:

(i) a reference to "the sub-facility during the year" were a reference to "the relevant deep open anaerobic lagoon in the historical period of sampling"; and

(ii) a reference to "facility operating data" were a reference to "data about the operation of the lagoon".

(3) For influent that is industrial wastewater, the amount is equivalent to parameter $COD_{w,i}$ calculated under Division 5.4.3 of the NGER (Measurement) Determination, with the following modifications:

(a) paragraphs 5.45(1)(c) and (2)(c) of that Determination are taken to be omitted;

(b) if the historical period of sampling is 10 consecutive days—the reference to a monthly basis in section 5.46 of that Determination is taken to be a reference to a daily basis;

(c) parameter $COD_{w,i}$ (as described in subsection 5.43(2) of the NGER (Measurement) Determination) applies as if:

(i) a reference to "the plant" were a reference to "the relevant deep open anaerobic lagoon in the historical period of sampling"; and

(ii) a reference to "facility operating data" were a reference to "data about the operation of the lagoon".

22 Fraction of chemical oxygen demand in influent that would be in sludge

(1) The fraction of COD_{In} (within the meaning of section 18) that would, in a deep open anaerobic lagoon, have been in sludge and not undergone treatment in the lagoon to produce methane, is worked out as follows:

(a) if the historical period of sampling is 10 consecutive days—using the default value mentioned in subsection (2);

(b) if the historical period of sampling is 1 year—using:

(i) the default value mentioned in subsection (2); or

(ii) equation 4.

(2) The default value is:

(a) for domestic or commercial wastewater only—0.6; or

(b) for industrial wastewater only—0.17; or

(c) for a mixture of domestic or commercial wastewater and industrial wastewater—0.6.

(3) The following formula is ***equation 4***:

$$F_{Slu} = \frac{COD_{Slu,DAL}}{COD_{In,DAL}}$$

where:

F_{Slu} means the fraction of COD_{In} (within the meaning of section 18) that would, in the relevant deep open anaerobic lagoon, have been in sludge and not undergone treatment in the lagoon to produce methane.

$COD_{Slu,DAL}$ means the amount of chemical oxygen demand in sludge in the relevant deep open anaerobic lagoon in the historical period of sampling (which is 1 year), in tonnes, worked out in accordance with section 23.

$COD_{In,DAL}$ means the amount of chemical oxygen demand in influent entering the relevant deep open anaerobic lagoon in the historical period of sampling (which is 1 year), in tonnes, worked out in accordance with section 21.

23 Chemical oxygen demand in sludge in a deep open anaerobic lagoon

(1) The amount of chemical oxygen demand in sludge in a deep open anaerobic lagoon in the historical period of sampling (which is 1 year), in tonnes, is worked out in accordance with this section.

(2) For sludge produced from the treatment of domestic or commercial wastewater, the amount is equivalent to parameter COD_{slz} calculated under Division 5.3.3 of the NGER (Measurement) Determination, with the following modifications:
   (a) paragraphs 5.28(1)(c) and (2)(c) of that Determination are taken to be omitted;
   (b) parameter COD_{slz} applies as if a reference to the quantity of COD removed as sludge (however described) from wastewater and treated in a sub-facility were a reference to the quantity of COD in sludge produced in the relevant deep open anaerobic lagoon in the historical period of sampling.

(3) For sludge produced from the treatment of industrial wastewater, the amount is equivalent to parameter COD_{sl} calculated under Division 5.4.3 of the NGER (Measurement) Determination, with the following modifications:
   (a) paragraphs 5.45(1)(c) and (2)(c) of that Determination are taken to be omitted;
   (b) parameter COD_{sl} applies as if:
      (i) a reference to the quantity of COD removed as sludge from wastewater during a year were a reference to the quantity of COD in sludge produced in the relevant deep open anaerobic lagoon in the historical period of sampling; and
      (ii) parameter $COD_{w,i}$ (as described in subsection 5.43(2) of the NGER (Measurement) Determination) applies in the same way as described in subsection 21(3).

24 Consequences if certain parameters are not determined correctly

(1) If parameter F_{Slu} is not determined correctly using equation 4, the fraction of COD_{In} (within the meaning of section 18) that would, in a deep open anaerobic lagoon, have been in sludge and not undergone treatment in the lagoon to produce methane, must be worked out using the default value mentioned in subsection 22(2).

(2) If parameter F_{Eff} is not determined correctly using equation 3:
   (a) baseline emissions for a reporting period must be worked out using Subdivision C; or

(b) the carbon dioxide equivalent net abatement amount for the reporting period is taken to be zero.

Note: If, under paragraph (2)(a), baseline emissions for a reporting period are worked out under Subdivision C, Subdivision C must be used for working out baseline emissions for subsequent reporting periods for the project: see subsection 17(4).

Subdivision C—Calculating baseline emissions using the amount of methane sent to a combustion device

25 Calculating baseline emissions using methane sent to a combustion device

The baseline emissions for the reporting period are worked out using the following formula (***equation 5***):

$$E_B = \gamma \times W_{EW} \times \sum_h M_{Sent,h} \times W_{DAL}$$

where:

E_B means the baseline emissions for the reporting period, in tonnes CO_2-e.

γ means the factor, set out in Part 5.3 of the NGER (Measurement) Determination, that converts cubic metres of methane to tonnes CO_2-e at standard conditions.

W_{EW} means the proportion of methane that is generated by eligible wastewater for the project during the reporting period, worked out in accordance with section 26.

h means a combustion device used during the reporting period.

$M_{Sent,h}$ means the methane sent to combustion device h during the reporting period, in cubic metres, worked out in accordance with section 30.

W_{DAL} means the proportion of methane that is generated in anaerobic digesters that would have been generated in the relevant deep open anaerobic lagoon, which is:

(a) if a covered lagoon is installed—1; or
(b) if an engineered biodigester is installed—0.75.

26 Proportion of methane that is generated by eligible wastewater

(1) The proportion of methane that is generated by eligible wastewater for the project during the reporting period is:
  (a) if both of the conditions in subsection (2) are satisfied for the reporting period—1;
  (b) if one or both of the conditions in subsection (2) are not satisfied for the reporting period—worked out using equation 6.

(2) The conditions are as follows:
  (a) the volume of an individual type of ineligible material for the project treated in anaerobic digesters during the reporting period ($Q_{Mat,w}$) does not

exceed 0.5% of the total volume of material treated in anaerobic digesters during the reporting period (***Q_{Mat}***);

(b) the volume of all ineligible material for the project treated in anaerobic digesters during the reporting period (***$\Sigma_w Q_{Mat,w}$***) is less than 2% of the total volume of material treated in anaerobic digesters during the reporting period (***Q_{Mat}***);

where $Q_{Mat,w}$ and Q_{Mat} are worked out in accordance with the monitoring requirements and ***w*** is a type of ineligible material for the project treated in anaerobic digesters during the reporting period.

(3) The following formula is ***equation 6***:

$$W_{EW} = \frac{M_{EW}}{\left(M_{IM} + M_{EW} \right)}$$

where:

W_{EW} means the proportion of methane that is generated by eligible wastewater for the project during the reporting period.

M_{EW} means methane generated by eligible wastewater for the project during the reporting period, in cubic metres, worked out using equation 7.

M_{IM} means methane generated by ineligible material for the project during the reporting period, in cubic metres, worked out using equation 8.

27 Methane generated by eligible wastewater

The methane generated by eligible wastewater for the project during the reporting period is worked out using the formula (***equation 7***):

$$M_{EW} = \sum_{w} \left(VS_w \times M_{Max,w} \right)$$

where:

M_{EW} means the methane generated by eligible wastewater for the project during the reporting period, in cubic metres.

w means a type of eligible wastewater for the project treated in anaerobic digesters during the reporting period.

VS_w means the amount of volatile solids from material type w treated in anaerobic digesters during the reporting period, in kilograms, worked out in accordance with the monitoring requirements.

$M_{Max,w}$ means the maximum methane-producing capacity of material type w, in cubic metres of methane per kilogram of volatile solids, worked out in accordance with section 29.

28 Methane generated by ineligible material

The methane generated by ineligible material for the project during the reporting period is worked out using the formula (***equation 8***):

$$M_{IM} = \sum_{w} (VS_w \times M_{Max,w})$$

where:

M_{IM} means the methane generated by ineligible material for the project during the reporting period, in cubic metres.

w means a type of ineligible material for the project treated in anaerobic digesters during the reporting period.

VS_w means the amount of volatile solids from material type w treated in anaerobic digesters during the reporting period, in kilograms, worked out in accordance with the monitoring requirements.

$M_{Max,w}$ means the maximum methane-producing capacity of material type w, in cubic metres of methane per kilogram of volatile solids, worked out in accordance with section 29.

29 Maximum methane-producing capacities

(1) The maximum methane-producing capacity of material type w (which could be eligible wastewater for the project or ineligible material for the project) (***$M_{Max,w}$***) is worked out in accordance with this section.

(2) If the table in clause 1 of Schedule 1 sets out a default value for material type w, $M_{Max,w}$ may be worked out:

(a) by using the default value in the table in clause 1 of Schedule 1 for material type w; or

(b) using the monitoring requirements.

Note: Different options (i.e. using the default value or using the monitoring requirements) may be used for different material types.

(3) If the table in clause 1 of Schedule 1 does not set out a default value for material type w, $M_{Max,w}$ must be worked out in accordance with the monitoring requirements.

(4) If, at any time during the project;

(a) the table in clause 1 of Schedule 1 is amended so that it sets out a default value for material type w; and

(b) before the amendment there was no default value set out in the table for material type w;

$M_{Max,w}$ may be worked out, following the amendment, by using the default value.

(5) However, if, at any time during the project:

(a) the table in clause 1 of Schedule 1 sets out a default value for material type w; and

(b) $M_{Max,w}$ is worked out in accordance with the monitoring requirements;

$M_{Max,w}$ must be worked out in accordance with the monitoring requirements for the remainder of the project.

30 Methane sent to combustion device

(1) The methane sent, during the reporting period, to combustion device h (which is used during the reporting period) is worked out as follows:

(a) if the device is an internal combustion engine—using equation 9 or 10;

(b) otherwise—using equation 9.

(2) The following formula is ***equation 9***:

$$M_{Sent,h} = Q_{BG,h} \times W_{BG,CH_4}$$

where:

$M_{Sent,h}$ means the methane sent to combustion device h during the reporting period, in cubic metres.

$Q_{BG,h}$ means the biogas sent to combustion device h during the reporting period, in cubic metres, worked out in accordance with the monitoring requirements.

W_{BG,CH_4} means the proportion of the volume of the biogas that is methane, worked out in accordance with the monitoring requirements.

(3) The following formula is ***equation 10***:

$$M_{Sent,h} = \frac{Q_{EG,h} \times F_{MWh \rightarrow GJ}}{EE_h \times EC_{BG}}$$

where:

$M_{Sent,h}$ means the methane sent to combustion device h during the reporting period, in cubic metres.

$Q_{EG,h}$ means the electricity (supplied to the electricity grid or used on-site) produced by combustion device h during the reporting period, in megawatt hours, worked out in accordance with the monitoring requirements.

$F_{MWh \rightarrow GJ}$ means the factor to convert megawatt hours to gigajoules, which is 3.6.

EE_h means:

(a) the factor for the electrical efficiency of combustion device h, determined in accordance with:

(i) the manufacturer's specifications for the combustion of biogas; and

(ii) if the specifications set out a range of such efficiencies—the highest of those efficiencies; or

(b) if the factor mentioned in paragraph (a) cannot be determined in accordance with the manufacturer's specifications—the amount set out in subsection 2.38(2) of the NGER (Measurement) Determination.

EC_{BG} means the energy content factor for sludge biogas that is captured for combustion (methane only), in gigajoules per cubic metre, set out in Part 2 of Schedule 1 to the NGER (Measurement) Determination.

Division 4—Project emissions

31 Summary

The project emissions for the reporting period are the emissions that result from operating the project during the reporting period. Emissions from fuel and electricity use, anaerobic digester leakage and venting events, combustion of biogas and digestate treatment are added together to determine the total project emissions.

32 Project emissions

The project emissions for the reporting period is worked out using the formula (***equation 11***):

$$E_P = E_F + E_{EP} + E_{AD} + E_{Com} + E_{Dig}$$

where:

E_P means the project emissions for the reporting period, in tonnes CO_2-e.

E_F means the emissions from fuel used during the reporting period, in tonnes CO_2-e, worked out using equation 12.

E_{EP} means the emissions from purchased electricity used during the reporting period, in tonnes CO_2-e, worked out using equation 13.

E_{AD} means the emissions from anaerobic digester leakage or venting events during the reporting period, in tonnes CO_2-e, worked out in accordance with section 35.

E_{Com} means the emissions from combustion devices during the reporting period, in tonnes CO_2-e, worked out using equation 16.

E_{Dig} means the emissions from the end management of the digestate treated during the reporting period, in tonnes CO_2-e, worked out using equation 17.

33 Emissions from fuel use

The emissions from fuel used during the reporting period is worked out using the formula (***equation 12***):

$$E_F = \sum_i \sum_j \frac{Q_{F,i} \times EC_i \times EF_{ij}}{1\,000}$$

where:

E_F means the emissions from fuel used during the reporting period, in tonnes CO_2-e.

i means a fuel type.

j means a greenhouse gas type.

$\boldsymbol{Q_{F,i}}$ means the amount of fuel type i used during the reporting period, in tonnes, kilolitres, cubic metres, or gigajoules, worked out in accordance with the monitoring requirements.

$\boldsymbol{EC_i}$ means the energy content factor for fuel type i in gigajoules per tonne, gigajoules per kilolitre or gigajoules per cubic metre, set out in Part 1, 2 or 3 of Schedule 1 to the NGER (Measurement) Determination.

Note: If $Q_{F,i}$ is measured in gigajoules, then EC_i is not required (EC_i=1).

$\boldsymbol{EF_{ij}}$ means the emission factor, in kilograms CO_2-e per gigajoule, set out in Part 1, 2 or 3 of Schedule 1 to the NGER (Measurement) Determination for greenhouse gas type j and fuel type i.

34 Emissions from purchased electricity use

(1) The emissions from purchased electricity used during the reporting period is worked out using the formula (***equation 13***):

$$E_{EP} = Q_{EP} \times \frac{EF_{EP}}{1\,000}$$

where:

$\boldsymbol{E_{EP}}$ means the emissions from purchased electricity used during the reporting period, in tonnes CO_2-e.

$\boldsymbol{Q_{EP}}$ means the amount of purchased electricity used during the reporting period, in kilowatt hours, worked out in accordance with the monitoring requirements.

$\boldsymbol{EF_{EP}}$ means:

(a) for electricity obtained from an electricity grid that is a grid in relation to which the NGA Factors document in force on the declaration day includes an emissions factor—that factor, in kilograms CO_2-e per kilowatt hour; or

(b) for electricity obtained from an electricity grid not covered by paragraph (a) or from a source other than an electricity grid:

(i) if the supplier of the electricity is able to provide an emissions factor that reflects the emissions intensity of the electricity and is applicable on the declaration day—that factor, in kilograms CO_2-e per kilowatt hour; or

(ii) otherwise—the emissions factor, in kilograms CO_2-e per kilowatt hour, for off-grid electricity included in the NGA Factors document in force on the declaration day.

(2) For subparagraph (b)(i) of the definition of $\boldsymbol{EF_{EP}}$ in subsection (1), the emissions factor must be worked out:

(a) on a sent-out basis; and

(b) using a measurement or estimation approach that is consistent with the NGER (Measurement) Determination.

(3) Section 6 does not apply to parameter EF_{EP}.

(4) In this section:

declaration day means the day the wastewater project was declared to be an eligible offsets project.

NGA Factors document means the document entitled "National Greenhouse Accounts Factors", published by the Department and as in force from time to time.

35 Emissions from anaerobic digester leakage or venting events

(1) The emissions from anaerobic digester leakage or venting events during the reporting period are worked out:

(a) if Subdivision B of Division 3 is used to work out baseline emissions for the reporting period—using equation 14; or

(b) if Subdivision C of Division 3 is used to work out baseline emissions for the reporting period—as follows:

(i) if the volume of all ineligible material for the project treated in anaerobic digesters during the reporting period ($\Sigma_w Q_{Mat,w}$) is less than 10% of the total volume of material treated in anaerobic digesters during the reporting period (Q_{Mat}), where $Q_{Mat,w}$ and Q_{Mat} are worked out in accordance with the monitoring requirements and ***w*** is a type of ineligible material for the project treated in anaerobic digesters during the reporting period—the emissions have a default value of zero;

(ii) otherwise—worked out using equation 14.

(2) The emissions from anaerobic digester leakage or venting events during the reporting period is worked out using the formula (***equation 14***):

$$E_{AD} = \gamma \times CF \times \left[\left(\frac{1}{CE} - 1 \right) \times \sum_{h} M_{Sent,h} + \sum_{q} M_{Vent,q} \right]$$

where:

E_{AD} means the emissions from anaerobic digester leakage or venting events during the reporting period, in tonnes CO_2-e.

γ means the factor, set out in Part 5.3 of the NGER (Measurement) Determination, that converts cubic metres of methane to tonnes CO_2-e at standard conditions.

CF means the correction factor to reflect the proportion of E_{AD} that is not accounted for in the calculation of baseline emissions, which is:

(a) if Subdivision B of Division 3 is used to work out baseline emissions for the reporting period—1; and

(b) if Subdivision C of Division 3 is used to work out baseline emissions for the reporting period—1 - W_{EW}.

CE means the biogas collection efficiency of an anaerobic digester, which is 0.98.

h means a combustion device used during the reporting period.

$M_{Sent,h}$ means the methane sent to combustion device h in the reporting period, in cubic metres, worked out in accordance with section 30.

q means a major venting event associated with an anaerobic digester during the reporting period.

$M_{Vent,q}$ means the volume of methane vented due to major venting event q during the reporting period, in cubic metres, worked out using equation 15.

W_{EW} means the proportion of methane that is generated by eligible wastewater for the project during the reporting period, worked out in accordance with section 26.

36 Volume of methane vented due to a major venting event

If a major venting event associated with an anaerobic digester occurs during the reporting period, the volume of methane vented due to the major venting event is worked out using the formula (***equation 15***):

$$M_{Vent,q} = \left(MS_{BCS} + \left(FR_q \times t_q \right) \right) \times W_{BG,CH_4}$$

where:

$M_{Vent,q}$ means the volume of methane vented due to major venting event q, in cubic metres.

MS_{BCS} means the maximum biogas storage capacity, of the anaerobic digester, in cubic metres, worked out in accordance with the monitoring requirements.

FR_q means the average total daily flow of biogas, from the anaerobic digester for the 7 days before major venting event q, in cubic metres per day, worked out in accordance with the monitoring requirements.

t_q means the number of days for all or part of which major venting event q is uncontrolled, worked out in accordance with the monitoring requirements.

W_{BG,CH_4} means the proportion of the volume of the biogas that is methane, worked out in accordance with the monitoring requirements.

37 Emissions from combustion of biogas

The emissions from combustion devices during the reporting period is worked out using the following formula (***equation 16***):

$$E_{Com} = \frac{\sum_h M_{Sent,h} \times EC_{BG} \times \sum_j EF_j}{1\,000}$$

where:

E_{Com} means the emissions from combustion devices during the reporting period, in tonnes CO_2-e.

h means a combustion device used during the reporting period.

$M_{Sent,h}$ means the methane sent to combustion device h in the reporting period, in cubic metres, worked out in accordance with section 30.

EC_{BG} means the energy content factor for sludge biogas that is captured for combustion (methane only), in gigajoules per cubic metre, set out in Part 2 of Schedule 1 to the NGER (Measurement) Determination.

j means a greenhouse gas type, which is methane or nitrous oxide.

EF_j means the emissions factor for greenhouse gas type j for combustion of sludge biogas that is captured for combustion (methane only), in kilograms CO_2-e per gigajoule, set out in Part 2 of Schedule 1 to the NGER (Measurement) Determination.

38 Emissions from the end management of digestate

The emissions from the end management of digestate treated during the reporting period is worked out using the formula (***equation 17***):

$$E_{Dig} = \sum_{n} E_{Dig,n}$$

where:

E_{Dig} means the emissions from the end management of digestate removed during the reporting period, in tonnes CO_2-e.

n means a type of digestate treatment.

$E_{Dig,n}$ means the emissions $E_{Dig,Aer,n}$, $E_{Dig,LF}$ and $E_{Dig,Lag}$ from digestate treatment type n, in tonnes CO_2-e:

(a) worked out using equation 18, 19 or 20, depending on the treatment type; or

(b) for a treatment type not covered by one of those equations—with a default value of zero.

39 Digestate emissions—aerobic treatment

(1) This section applies to the following digestate treatment types:

(a) treatment in uncovered non-aerated static piles;

(b) treatment at an undocumented facility;

(c) treatment in aerated systems (turned windrows or aerated static piles);

(d) treatment at a centralised composting facility;

(e) treatment in an enclosed system (in-vessel) using a bio-filter or biogas scrubber.

(2) The emissions from the treatment of the digestate, using treatment type n, is worked out using the formula (***equation 18***):

$$E_{Dig,Aer,n} = Q_{Dig,n} \times EF_{Dig,n}$$

where:

$E_{Dig,Aer,n}$ means the emissions from the treatment of the digestate, using treatment type n, in tonnes CO_2-e.

$Q_{Dig,n}$ means the wet weight of digestate treated using treatment type n, in tonnes, worked out in accordance with the monitoring requirements.

$EF_{Dig,n}$ means the emissions factor for treatment type n, in tonnes CO_2-e per tonne of wet weight digestate, set out in the following table.

Emissions factor for digestate treatment (t CO_2-e/t wet weight digestate)

Item	Treatment type n	$EF_{Dig,n}$
1	Treatment in uncovered non-aerated static piles	0.10
2	Treatment at an undocumented facility	0.10
3	Treatment in aerated systems (turned windrows or aerated static piles)	0.06
4	Treatment at a centralised composting facility	0.06
5	Treatment in an enclosed system (in-vessel) using a bio-filter or biogas scrubber	0.02

40 Digestate emissions—disposed to landfill

The emissions from digestate disposed to landfill is worked out using the formula (***equation 19***):

$$E_{Dig,LF} = Q_{Dig,n} \times EF_{Dig,n} \times \left(1 - W_{LFG}\right)$$

where:

$E_{Dig,LF}$ means the emissions from digestate disposed to landfill, in tonnes CO_2-e.

$Q_{Dig,n}$ means the wet weight of digestate treated using treatment type n, in tonnes, worked out in accordance with the monitoring requirements.

Note: Treatment type n is the disposal of digestate to landfill.

$EF_{Dig,n}$ means the emissions factor for digestate disposed to landfill, in tonnes CO_2-e per tonne of wet weight digestate, which is 0.3.

W_{LFG} means the average capture rate set out in the following table for methane emissions from landfills in the State or Territory in which the project is located.

Average capture rate for methane emissions from landfills

Item	State or Territory	Rate (%)
1	New South Wales	37
2	Victoria	45
3	Queensland	30
4	Western Australia	30

Average capture rate for methane emissions from landfills		
Item	**State or Territory**	**Rate (%)**
5	South Australia	29
6	Tasmania	39
7	Australian Capital Territory	66
8	Northern Territory	18

41 Digestate emissions—treated in open lagoon

The emissions from digestate treated in an open lagoon is worked out using the formula (***equation 20***):

$$E_{Dig,Lag} = VS_{Dig} \times M_{Max,Dig} \times MCF_{Lag} \times GWP_{CH_4}$$

where:

$E_{Dig,Lag}$ means the emissions from digestate treated in an open lagoon, in tonnes CO_2-e.

VS_{Dig} means the volatile solids discharged from an anaerobic digester into the lagoon, in tonnes, worked out in accordance with the monitoring requirements.

Note: Determination of VS_{Dig} requires the determination of parameter $Q_{Dig,n}$ for the digestate where ***n*** is treatment in an open lagoon: see items 8 and 12 of the table in subsection 45(1).

$M_{Max,Dig}$ means the maximum methane-producing capacity of the digestate, in tonnes of methane per tonne of volatile solids, worked out in accordance with the monitoring requirements.

MCF_{Lag} means the methane correction factor for the lagoon, set out in Part 5.3 of the NGER (Measurement) Determination.

GWP_{CH_4} means the global warming potential value for methane, set out in regulation 2.02 of the NGER Regulations.

Part 5—Reporting, record-keeping and monitoring requirements

Note: Other reporting, record-keeping and monitoring requirements are set out in regulations and rules made under the Act.

Division 1—Offsets report requirements

42 Operation of this Division

For paragraph 106(3)(a) of the Act, this Division sets out information that must be included in an offsets report about a wastewater project that is an eligible offsets project.

43 Determination of certain factors and parameters

(1) If, in the circumstances described in paragraph 6(2)(b), a factor or parameter is defined or calculated for a reporting period by reference to an instrument or writing as in force from time to time, the offsets report about the project for the reporting period must include the following information for the factor or parameter:

(a) the versions of the instrument or writing used;

(b) the start and end dates of each use;

(c) the reasons why it was not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

(2) If a parameter is determined under section 46 for the purpose of working out the carbon dioxide equivalent net abatement amount for a wastewater project for a reporting period, the offsets report about the project for the reporting period must include the following information for the parameter:

(a) the name of the parameter;

(b) the start and end of the non-monitored period for which the parameter was determined;

(c) the reasons why the project proponent for the project failed to monitor the parameter as required by the monitoring requirements;

(d) the value of the parameter and how that value was determined.

Division 2—Monitoring requirements

44 Operation of this Division

For paragraph 106(3)(d) of the Act, this Division sets out:

(a) requirements to monitor a wastewater project that is an eligible offsets project (see section 45); and

(b) certain consequences if the project proponent for the project fails to monitor the project as required (see section 46).

45 Requirement to monitor certain parameters

(1) If the project proponent for a wastewater project is required, under Part 4, to work out a parameter in accordance with the monitoring requirements, the project proponent must monitor and determine the parameter in accordance with the following table.

Monitored Parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
1	$Q_{Mat,w}$	Volume of material type w treated in anaerobic digesters	Kilolitres	Project proponent may choose from the following measurement options: (a) the volume of wastewater received during the reporting period as evidenced by invoices; (b) in accordance with appropriate measuring requirements relevant to the measurement of the material. Frequency—daily.	Cumulative value for the reporting period.

Monitored Parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
2	Q_{Mat}	Total volume of material treated in anaerobic digesters	Kilolitres	Project proponent may choose from the following measurement options: (a) the volume of material received during the reporting period as evidenced by invoices; (b) in accordance with appropriate measuring requirements relevant to the measurement of the amount of the material. Frequency—daily.	Cumulative value for the reporting period.
3	$Q_{BG,h}$	Biogas sent to combustion device h	Cubic metres	Estimated under Division 2.3.6 of the NGER (Measurement) Determination. Frequency—continuous.	For equation 9, if parameter W_{BG,CH_4} is measured on a continuous basis, cumulative values for a time interval not greater than 1 minute must be paired to measurements of W_{BG,CH_4} for the same time interval. Otherwise, cumulative measurements must be paired to measurements of W_{BG,CH_4} that correspond to the same measurement interval.

Monitored Parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
4	W_{BG,CH_4}	Proportion of the volume of biogas that is methane	Fraction	Estimated under Subdivision 2.3.3.2, or Division 2.3.6, of the NGER (Measurement) Determination. Frequency—continuous or at least monthly.	If monitored continuously: (a) for equation 9—the average value for a time interval not greater than 1 minute must be paired to measurements of parameter $Q_{BG,h}$ for the same time interval; and (b) for equation 15—the average value for the period of 7 days before a major venting event. If not monitored continuously: (a) for equation 9—the value from the sample must be paired to the cumulative value of parameter $Q_{BG,h}$ that is determined in the period between when the sample is taken and immediately before the next sample is taken; and (b) for equation 15—the value for the most recent sample taken before the period of 7 days before a major venting event.

Monitored Parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
5	$Q_{EG,h}$	Electricity (supplied to the electricity grid or used on-site) produced by internal combustion engine h	Megawatt hours	Estimated under Part 6.1 of the NGER (Measurement) Determination. Frequency—continuous. Measure only the electricity produced from the combustion of wastewater biogas (not from the combustion of other fuel types).	Cumulative value for the reporting period.
6	$Q_{F,i}$	Amount of fuel type i used	Tonnes, kilolitres, cubic metres or gigajoules	Project proponent may choose from the following: (a) estimated in accordance with Division 2.2.5, 2.3.6 or 2.4.6 of the NGER (Measurement) Determination (as appropriate to the fuel type); (b) evidenced by invoices, contractual arrangements or industry metering records. Measure only the fuel used to operate the project. Frequency—continuous.	Cumulative value for the reporting period.
7	Q_{EP}	Amount of purchased electricity used	Kilowatt hours	Evidence by invoices, contractual arrangements or industry metering records. If Q_{EP} is measured in gigajoules, the amount of kilowatt hours must be calculated by dividing the amount of gigajoules by the conversion factor of 0.0036. Measure only the electricity used to operate the project. Frequency—continuous.	Cumulative value for the reporting period.

Monitored Parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
8	$Q_{Dig,n}$	Wet weight of digestate treated using treatment type n	Tonnes	Measurements are undertaken in accordance with appropriate measuring requirements. Frequency—when digestate is treated using treatment type n.	Cumulative value for the reporting period.
9	$M_{Max,Dig}$	Maximum methane-producing capacity of digestate	Tonnes of methane per tonne of volatile solids	The estimation must be made by a laboratory in accordance with *Method 6211 (2000)* or *Method 2720 (1997)* of the American Public Health Association Method or an equivalent Australian or international standard. Samples from composite of amounts of digestate collected before being sent to an open lagoon. Enough samples must be collected to produce a representative sample. The samples of digestate used for the measurement must be delivered to a laboratory within 24 hours of collection and analysed in triplicate. Frequency: (a) at least once a month; or (b) if less frequent than once a month—on each occasion the digestate is treated in an open lagoon.	Average of all measurements made during the reporting period.

Monitored Parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
10	$M_{Max,w}$	Maximum methane-producing capacity of material type w treated in anaerobic digesters	Cubic metres of methane per kilogram of volatile solids	The estimation must be made by a laboratory in accordance with *Method 6211 (2000)* or *Method 2720 (1997)* of the American Public Health Association Method or an equivalent Australian or international standard. The samples of material type w used for the measurement must be: (a) taken concurrently with each time material type w is being treated in an anaerobic digester; and (b) taken before being combined with other material types and entering an anaerobic digester; and (c) sufficient in number to produce a representative sample. Frequency—at least once for each month that material type w is treated in an anaerobic digester.	Average of all measurements made during the reporting period for material type w.

Monitored Parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
11	VS_w	Amount of volatile solids from material type w treated in anaerobic digesters	Kilograms	The estimation must be made by a laboratory in accordance with *Method 2540E* of the American Public Health Association Method or an equivalent Australian or international standard. The samples of material type w used for the measurement must be: (a) taken concurrently with each time material type w is being treated in an anaerobic digester; and (b) taken before being combined with other material types and entering an anaerobic digester; and (c) sufficient in number to produce a representative sample. Frequency—at least once for each month that material type w is treated in an anaerobic digester.	The total amount of volatile solids of material type w treated in the reporting period must be derived by extrapolating the amount of volatile solids in the sample to the volume of material type w (see parameter $Q_{Mat,w}$) that was treated in the time between the sample measurements.

Monitored Parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
12	VS_{Dig}	Volatile solids discharged from an anaerobic digester into an open lagoon	Tonnes	Volatile solids must be measured under *Method 2540E* of the American Public Health Association Method or an equivalent Australian or international standard. Samples from composite of amounts of digestate collected before being sent to an open lagoon. Enough samples must be collected to produce a representative sample. Frequency: (a) at least once a month; or (b) if less frequent than once a month—on each occasion the digestate is treated in an open lagoon.	The total amount of volatile solids of digestate treated in the reporting period must be derived by extrapolating the amount of volatile solids in the sample to the wet weight of digestate material (see parameter $Q_{Dig,n}$) that was treated in the lagoon in the time between the sample measurements.
13	FR_q	Average total daily flow of biogas from an anaerobic digester for the 7 days before major venting event q	Cubic metres per day	Calculated from $Q_{BG,h}$, as monitored in accordance with item 3.	Cumulative value of biogas sent to combustion devices in the 7 days before each major venting event, divided by 7.
14	MS_{BCS}	Maximum biogas storage capacity of an anaerobic digester	Cubic metres	Either: (a) measured directly; or (b) calculated using the manufacturer's specifications for the anaerobic digester.	At the following times: (a) when the anaerobic digester is installed; (b) when the anaerobic digester is upgraded in a way that changes the storage capacity.

Section 45

Monitored Parameters

	Parameter	Description	Unit	Measurement procedure (including frequency as required)	Determination of parameter from measurements
15	t_q	Number of days for all or part of which major venting event q is uncontrolled	Whole days	Frequency—for each major venting event.	
16	COD_{ln}	Amount of chemical oxygen demand in eligible wastewater for the project entering anaerobic digesters	Tonnes	For domestic or commercial wastewater—estimated consistently with determining parameter COD_{wz} under Division 5.3.3 of the NGER (Measurement) Determination, with the following modifications: (a) paragraphs 5.28(1)(c) and (2)(c) of that Determination are taken to be omitted; (b) parameter COD_{wz} applies as if: (i) a reference to "the sub-facility during the year" were a reference to "the anaerobic digester in the reporting period"; and (ii) a reference to "facility operating data" were a reference to "data about the operation of the anaerobic digester". For industrial wastewater—estimated consistently with determining parameter $COD_{w,i}$ under Division 5.4.3 of the NGER (Measurement)	

Monitored Parameters				
Parameter	**Description**	**Unit**	**Measurement procedure (including frequency as required)**	**Determination of parameter from measurements**
			Determination, with the following modifications: (a) paragraphs 5.45(1)(c) and (2)(c) of that Determination are taken to be omitted; (b) parameter $COD_{w,i}$ (as described in subsection 5.43(2) of the NGER (Measurement) Determination) applies as if: (i) a reference to "the plant" were a reference to "the anaerobic digester in the reporting period"; and (ii) a reference to "facility operating data" were a reference to "data about the operation of the anaerobic digester".	

Note: The American Public Health Association Method is also known as the Standard Methods for the Examination of Water and Wastewater.

(2) Any equipment or device used to monitor a parameter must be calibrated by an accredited third party technician at intervals, and using methods, that are in accordance with the manufacturer's specifications.

(3) In this section:

appropriate measuring requirements, in relation to a measurement or estimate, means requirements that are consistent with:

(a) requirements that apply in relation to similar measurements or estimates under the NGER (Measurement) Determination; or

(b) relevant standards and other requirements under the *National Measurement Act 1960*.

Section 46

46 Consequences of not meeting requirement to monitor certain parameters

(1) If, during a particular period (the ***non-monitored period***) in a reporting period, the project proponent for a wastewater project fails to monitor a parameter as required by the monitoring requirements, the value of the parameter for the purpose of working out the carbon dioxide equivalent net abatement amount for the reporting period is to be determined for the non-monitored period in accordance with the following table.

Consequence of not meeting requirement to monitor certain parameters

Item	Parameter	Determination of parameter for non-monitored period
1	$M_{Max,w}$ (if w is mentioned in Schedule 1)	Where w is a type of ineligible material for the project, the parameter is: (a) for any cumulative period of up to 3 months in any 12 months of a crediting period for the project—the amount set out in Schedule 1 multiplied by 1.1; and (b) for any period in excess of that 3 months—the amount set out in Schedule 1 multiplied by 1.5. Where w is eligible wastewater for the project, the parameter is: (a) for any cumulative period of up to 3 months in any 12 months of a crediting period for the project—the amount set out in Schedule 1 multiplied by 0.9; and (b) for any period in excess of that 3 months—the amount set out in Schedule 1 multiplied by 0.5.
2	Each of the following: (a) $Q_{Mat,w}$; (b) Q_{Mat}; (c) $Q_{BG,h}$; (d) W_{BG,CH_4}; (e) $Q_{EG,h}$; (f) $Q_{F,i}$; (g) Q_{EP}; (h) $Q_{Dig,n}$; (i) $M_{Max,Dig}$; (j) $M_{Max,w}$ (if w is not mentioned in Schedule 1); (k) VS_w; (l) VS_{Dig}; (m) FR_q; (n) MS_{BCS}; (o) t_q; (p) COD_{In}.	The project proponent must make a conservative estimate of the parameter having regard to: (a) any relevant measurement or estimation approaches or requirements that apply to the parameter under the NGER (Measurement) Determination; and (b) any relevant historical data for the project; and (c) any other data for the project that relates to the parameter; and (d) any other matter the project proponent considers relevant.

(2) To avoid doubt, this section does not prevent the Regulator from taking action under the Act, or regulations or rules made under the Act, in relation to the

project proponent's failure to monitor a parameter as required by the monitoring requirements.

Note: Examples of action that may be taken include the following:

(a) if the failure constitutes a breach of a civil penalty provision in section 194 of the Act (which deals with project monitoring requirements), the Regulator may apply for a civil penalty order in respect of the breach;

(b) if false or misleading information was given to the Regulator in relation to the failure, the Regulator may revoke the project's section 27 declaration under regulations or rules made for the purposes of section 38 of the Act;

(c) if the giving of false or misleading information in relation to the failure led to the issue of Australian carbon credit units, the Regulator may require all or some of those units to be relinquished under section 88 of the Act.

Clause 1

Schedule 1—Default maximum methane-producing capacities

Note: See paragraph 29(2)(a).

1 Default maximum methane-producing capacities

The following table sets out default values for the maximum methane-producing capacity for types of material (which could be eligible wastewater for the project or ineligible material for the project).

Default maximum methane-producing capacities

Item	Material type	Cubic metres of methane per kilogram of volatile solids (m^3 CH_4/kg VS)
1	Sheep manure	0.25
2	Rabbit manure	0.17
3	Feeder cattle liquid manure	0.22
4	Cow dung fresh	0.25
5	Horse dung	0.17
6	Poultry excrement, dry	0.28
7	Poultry excrement	0.33
8	Slaughterhouse waste	0.61
9	Press mud	0.22
10	Freshly wilted grass	0.30
11	Grass silage	0.32
12	Green pruning (DM content very variable)	0.34
13	Food waste, low fat	0.50
14	Food waste, high fat and grease trap waste	0.70
15	Ulva sp. Macroalgae (saltwater)	0.10
16	Oedogonium sp. Macroalgae (freshwater)	0.16
17	Cladophora sp. Macroalgae (freshwater)	0.23
18	Microalgae polyculture (freshwater)	0.20
19	Cabbage leaves	0.33
20	Maize silage	0.30
21	Bakery waste	0.40
22	Cheese waste	0.61
23	Spent grains fresh (brewery)	0.33
24	Vegetable matter	0.34

Default maximum methane-producing capacities		
Item	**Material type**	**Cubic metres of methane per kilogram of volatile solids (m^3 CH_4/kg VS)**
25	Barley (cereal/corn)	0.39
26	Barley straw	0.30
27	Glycerine	0.37
28	Rye silage barley/wheat (low grain)	0.27
29	Wheat (cereals)	0.39
30	Wheat bran	0.29
31	Wheat chaff	0.30
32	Wheat straw	0.30
33	Winter peas (whole plant silage, mid-flowering)	0.27
34	Blood	0.48