

Superseded

Alberta  Government

**Specified Gas Reporting Standard**  
**Specified Gas Reporting Regulation**

---

Version 10.0

May 2018



|                                      |   |
|--------------------------------------|---|
| <b>Title:</b>                        | <b>Specified Gas Reporting Standard</b>   |
| <b>Number:</b>                       | <b>10.0</b>   |
| <b>Program Name:</b>                 | <b>Specified Gas Reporting Regulation</b>   |
| <b>Effective Date:</b>               | <b>January 1, 2018</b>  |
| <b>This document was updated on:</b> | <b>May 28, 2018</b>   |
| <b>ISBN No.:</b>                     | <b>ISBN: 978-0-7785-8819-1 (Printed)</b><br><b>ISBN: 978-0-7785-8820-7 (Online)</b> |

Superseded

Copyright in this publication, regardless of format, belongs to Her Majesty the Queen in right of the Province of Alberta. Reproduction of this publication, in whole or in part, regardless of purpose, requires the prior written permission of Alberta Environment and Parks.

© Her Majesty the Queen in right of the Province of Alberta, 2018

## Summary of Revisions

| Version | Date       | Summary of Revisions  |
|---------|------------|---|
| 10.0    | May 2018   | <ul style="list-style-type: none"> <li>• A definition for threshold emissions has been added in order to distinguish it from the broader definition of direct emissions.</li> <li>• The definitions of leakage and waste emissions were updated to align with Environment and Climate Change Canada's (ECCC) exclusion of biological emissions from Agricultural operations.</li> <li>• The definition of industrial product use emissions was updated to align with Environment and Climate Change Canada's (ECCC) definition, which excludes certain PFC &amp; HFC emissions, including those associated with refrigeration and air conditioning.</li> </ul>  |
| 9.0     | March 2018 | <ul style="list-style-type: none"> <li>• The reporting threshold is dropped from 50,000 to 10,000 tonnes CO<sub>2</sub>e per annum for all facilities to align with Environment and Climate Change Canada's (ECCC) Greenhouse Gas Emissions Reporting Program.</li> <li>• Biomass CO<sub>2</sub> emissions, and CO<sub>2</sub> sent off site have been removed from direct emissions.</li> <li>• More detailed emissions data and supporting information are collected for Cement manufacturing, Lime manufacturing, Iron and Steel manufacturing and Aluminium manufacturing to align with ECCC's Greenhouse Gas Reporting Program.</li> <li>• Mandatory reporting requirements for Carbon Capture Transportation and Geological Storage (CCTS) to align with ECCC's Greenhouse Gas Reporting Program.</li> <li>• Updated references to ECCC's GHG Emissions Reporting Program proposed expansion.</li> <li>• ECCC's GHG quantification requirements must be followed as referred to in this standard and Alberta's GHG Standard Quantification Methodology should be used as a guideline for 2017 emissions reporting and will be required for 2018 emissions reporting.</li> <li>• The requirement for net specified gases less offsets or emission reduction equivalencies, and specified gas intensity has been removed. The section previously titled Additional Specified Gas Reporting Information has been deleted, and unique requirements have been transferred to the section Mandatory Specified Gas Emissions Information.</li> </ul> |
| 8.0     | March 2014 | <ul style="list-style-type: none"> <li>• The <b>global warming potentials</b> (Section 2(2)) have been updated to those established in 2007 by the Intergovernmental Panel on Climate Change. This maintains alignment with Environment Canada's reporting program and National Inventory Report.</li> </ul>  |

- 
- Requiring the **specified gas reporter** to be the person responsible for the facility, as defined in the Specified Gas Reporting Regulation (Section 3(2)).
  - Additional data on **greenhouse gas intensive inputs and outputs** is now being collected (Sections 5(1) and 6(1)):
    - the net electricity imported or exported for the facility;
    - the amount of net heat imported or exported for the facility; and,
    - the amount of net H<sub>2</sub> imported or exported (excluding trace H<sub>2</sub> in fuels).
  - **Cogeneration** data is now being collected (Section 6(1) and Appendix A).
  - For quantification of **area fugitive emissions from mine faces and tailings ponds**, oil sands facilities must use the Guidance for the Quantification of Area Fugitive Emissions at Oil Sands Mines (Section 7(1)).
- 

7.0

March 2013

*Specified Gas Reporting Standard*

---

## Table of Contents

|  |    |
|--|----|
| Summary of Revisions .....                             | 3  |
| 1 Definitions .....                                    | 6  |
| 2 Specified Gas Reporting Threshold.....               | 10 |
| 3 Specified Gas Report Submission .....                | 12 |
| 4 Specified Gas Reporter and Facility Information..... | 13 |
| 5 Mandatory Specified Gas Emissions Information.....   | 14 |
| 6 Methodology.....                                     | 17 |
| Appendix A – Cogeneration Calculations .....           | 18 |
| References.....  | 21 |

## List of Tables

|   |    |
|---|----|
| Table 1: Global warming potential for Specified Gases.....                  | 12 |
| Table 2: Reported emissions categories and typical specified gas types..... | 16 |
| Table 3: Direct emissions categories and typical specified gas types .....  | 16 |

# 1 Definitions

## 1(1) In this Standard,

- (a) “aluminium manufacturing” means primary processes that are used to manufacture aluminium from alumina, including electrolysis in prebake and Söderberg cells, anode and cathode baking for prebake cells, and green coke calcination;
- (b) “biomass” means plant materials, animal waste or any product made of either of these and includes without limitation wood and wood products, charcoal, agricultural residues and wastes including organic material above and below ground, both living and dead, such as trees, crops, grasses, tree litter, roots, municipal and industrial wastes where the organic material is biological in origin, landfill gas, bio-alcohols, black liquor, sludge gas, and animal- or plant-derived oils;
- (c) “biomass CO<sub>2</sub> emissions” means all emissions of carbon dioxide released from sources located at a facility as a result of the decomposition or combustion of biomass;
- (d) “cement manufacturing” means all processes used to manufacture portland, ordinary portland, masonry, pozzolanic or other hydraulic cements;
- (e) “CO<sub>2</sub> capture” means the capture of carbon dioxide at a facility that would otherwise be released to atmosphere;
- (f) “CO<sub>2</sub> geologically-injected on site” means carbon dioxide that has been injected into a geological formation from an injection point within the facility including without limitation carbon dioxide injected for enhanced oil or gas recovery, acid gas disposal, or CO<sub>2</sub> storage;
- (g) “CO<sub>2</sub> received on site” means carbon dioxide that has been received at a facility from an off-site location;
- (h) “CO<sub>2</sub> sent off site” means carbon dioxide that has not been released to the atmosphere and has been sent from a facility to an off-site location, including CO<sub>2</sub> sent off site as waste, or sold as a product, but does not include trace carbon dioxide in products;
- (i) “CO<sub>2</sub> storage” means a long-term geological formation where carbon dioxide is stored;
- (j) “CO<sub>2</sub> transport system” means transport of captured carbon dioxide by any mode;

- (k) “CO<sub>2</sub>e” means the 100-year time horizon global warming potential of a specified gas expressed in terms of equivalency to carbon dioxide as published by the Intergovernmental Panel on Climate Change;
- (l) “direct emissions” means all specified gases released from sources located at a facility, not including biomass CO<sub>2</sub> emissions, expressed in tonnes on a CO<sub>2</sub>e basis;
- (m) “emission factor” means the representative value that relates the rate or quantity of a specified gas released to the atmosphere with an activity associated with the release of that specified gas; “emission factor estimation” means a type of emissions estimation method that uses an emissions factor that is average, general, or technology specific;
- (n) “engineering estimate” means a type of emissions estimation method involving engineering principles and judgment that uses knowledge of the chemical and physical processes involved at the emissions source, the design features of the emissions source, and an understanding of the applicable physical and chemical laws;
- (o) “first year of operations” in respect of a facility means the year in which the facility first produces a product;
- (p) “flaring emissions” means direct emissions from the controlled combustion of a gas or liquid stream produced on site, used for routine or emergency disposal of a hazardous stream, where the main purpose is not energy production and includes without limitation emissions from waste petroleum incineration, hazardous emissions prevention systems (whether in pilot or active mode), and flare purge gas. Activities that commonly use flaring include well testing, natural gas gathering systems, processing plant operations, crude oil production, pipeline operations, petroleum refining, chemical fertilizer production and steel production. The flaring category does not include any specified gas emissions from combustion of biomass or landfill gas;
- (q) “formation CO<sub>2</sub>” means carbon dioxide from an underground reservoir that is recovered or is recoverable, including vented carbon dioxide emissions from natural gas processing, but not including entrained carbon dioxide in flare or fuel gas that is released through flare or combustion stacks;
- (r) “global warming potential” means the relative measure of the warming effect that the emission of a specified gas has on the Earth’s atmosphere calculated as the ratio of the 100-year time-integrated radiative forcing that would result from the emission of one kilogram of a given specified gas relative to that from the emission of one kilogram of carbon dioxide;
- (s) “industrial process emissions” means direct emissions from an industrial process involving chemical or physical reactions other than combustion, where the primary purpose of the industrial process is not energy production;

- (t) “industrial product use emissions” means direct emissions from the use of a product that does not react in a facility’s production processes. This includes direct emissions of SF<sub>6</sub>, HFCs and PFCs as cover gases, and the use of HFCs and PFCs in foam blowing. This does not include releases from PFCs and HFCs in refrigeration, air conditioning, semiconductor manufacturing, fire extinguishing, solvents, aerosols and SF<sub>6</sub> in explosion protection, leak detection, electronic applications and fire extinguishing;
- (u) “leakage emissions” means direct emissions from accidental releases and leaks from any of the following:
- a. fossil fuel production and processing, transmission and distribution;
  - b. iron and steel manufacturing;
  - c. CO<sub>2</sub> capture, CO<sub>2</sub> transport system, CO<sub>2</sub> geologically-injected on site, and CO<sub>2</sub> storage; or
  - d. mine faces and tailings ponds; and
- does not include agriculture emissions from enteric fermentation, manure management, agricultural soils, crop residue burning, or application of fertilizers (e.g. liming, urea application and other carbon-containing fertilizers).
- (v) “mass balance” means a type of emissions estimation method that involves the application of the law of conservation of mass to a facility, process or piece of equipment;
- (w) “monitoring or direct measurement” means a type of emissions estimation method using continuous emissions monitoring systems, correlations developed between measured emission rates and process parameters, fuel sampling, or source testing;
- (x) “product” means, for the purposes of this standard, product as defined in the Carbon Competitiveness Incentive Regulation;
- (y) “on-site transportation emissions” means direct emissions from machinery used for the on-site transportation of substances, materials or products that are integral to the production process, including without limitation raw, intermediate and end products, wastes, overburden, and materials moved for land clearing;
- (z) “Regulation” means the Specified Gas Reporting Regulation;
- (aa) “Specified gas” means specified gas as defined in the Carbon Competitiveness Incentive Regulation;



- (bb) “stationary fuel combustion emissions” means direct emissions from devices that combust solid, liquid, or gaseous fuel, generally for the purposes of providing useful heat or energy for industrial, commercial, or institutional use;
- (cc) “SWIM system” means the federal Single Window system, which is a one-window secure online electronic data reporting system accessible at:  
▪ <https://ec.ss.ec.gc.ca/>
- (dd) “threshold emissions” means the threshold emissions of a facility determined in accordance with section 2(2);
- (ee) “venting emissions” means direct emissions from the controlled release of
- a. carbon dioxide associated with carbon capture, transport, injection and storage, or
  - b. a process gas, or waste gas, including releases:
    - i. from hydrogen production associated with fossil fuel production and processing;
    - ii. of casing gas;
    - iii. of gases associated with a liquid or a solution gas;
    - iv. of treater, stabilizer or dehydrator off-gas;
    - v. of blanket gases;
    - vi. from pneumatic devices which use natural gas as a driver;
    - vii. from compressor start-ups, pipelines and other blowdowns; and,
    - viii. from metering and regulation station control loops.
- (ff) “waste emissions” means direct emissions from waste disposal sources, including but not limited to on-site waste disposal, fermentation, decomposition, landfilling of solid waste, flaring of landfill gas and waste incineration, but not including burning of agricultural crop residues;
- (gg) “wastewater emissions” means direct emissions from wastewater and wastewater treatment at a facility;
- (hh) “year” means a calendar year unless otherwise specified.

(2) Terms that are defined in the Act and Regulation are incorporated and become part of this Standard.

(3) Where this Standard uses a term defined in the SWIM system that has a meaning that is different, the term is deemed to have the meaning set out in this Standard.

## 1.1 In the event of a conflict

1.1 If there is any conflict between this Standard and the Act or the Regulation, the Act or the Regulation prevails over this standard.

## 1.2 Specified Gas Reporter

1.2 For the purposes of this Standard, the specified gas reporter for a facility for a year is the person responsible for the facility, on December 31 of that year.

## 2 Specified Gas Reporting Threshold

2(1) The level prescribed for the purposes of section 3(1) of the Regulation is 10,000 tonnes of threshold emissions released from the facility.

(2) For the purposes of subsection (1), the specified gas reporter for a facility shall determine the threshold emissions of the facility for a year in accordance with the following formula:

$$TE = \sum_{i=1}^n [(E_{CO_2i} \times GWP_{CO_2}) + (E_{CH_4i} \times GWP_{CH_4}) + (E_{N_2O_i} \times GWP_{N_2O}) + (E_{SF_6i} \times GWP_{SF_6})] \\ + \sum_{v=1}^m (E_{PFCi,v} \times GWP_{PFCv}) + \sum_{q=1}^p (E_{HFCi,q} \times GWP_{HFCq})]$$

where:

TE is the threshold emissions of the facility for the year;

$E_{CO_2}$  is the emissions of carbon dioxide for the facility for the year for each threshold emissions source category  $i$  specified in Table 3;

$GWP_{CO_2}$  is the global warming potential of carbon dioxide as specified in Table 1;

$E_{CH_4}$  is the emissions of methane for the facility for the year, for each threshold emissions source category  $i$  specified in Table 3;

$GWP_{CH_4}$  is the global warming potential of methane as specified in Table 1;

$E_{N_2O}$  is the emissions of nitrous oxide for the facility for the year, for each threshold emissions source category  $i$  specified in Table 3;

$GWP_{N_2O}$  is the global warming potential of nitrous oxide as specified in Table 1;

$E_{SF_6}$  is the total of industrial process emissions and industrial product use emissions for the facility, restricted to sulfur hexafluoride, in the year;

$GWP_{SF_6}$  is the global warming potential of sulfur hexafluoride as specified in Table 1;

$E_{PFC}$  is the total of industrial process emissions and industrial product use for the facility, restricted to perfluorocarbon species, in the year;

$GWP_{PFC}$  is the global warming potential of perfluorocarbon species as specified in Table 1;

$E_{HFC}$  is the total of industrial process emissions and industrial product use emissions for the facility, restricted to hydrofluorocarbon species, in the year;

$GWP_{HFC}$  is the global warming potential of hydrofluorocarbon species as specified in Table 1;

$i$  is a particular threshold emission source category listed in Table 3;

$v$  is a particular perfluorocarbon species listed in Table 1;

$n$  is the number of threshold emissions source categories listed in Table 3 that are at the facility;

$m$  is the number of perfluorocarbon species listed in Table 1 that are released at the facility;

$p$  is the number of hydrofluorocarbon species listed in Table 1 that are released at the facility;

$q$  is a particular hydrofluorocarbon species listed in Table 1.

**Table 1: Global warming potential for Specified Gases**

| Specified Gas                           | Formula   | Global Warming Potential |
|---|---|--------------------------|
| Carbon dioxide                          | CO <sub>2</sub>   | 1                        |
| Methane                                 | CH <sub>4</sub>   | 25                       |
| Nitrous oxide                           | N <sub>2</sub> O  | 298                      |
| Sulphur hexafluoride                    | SF <sub>6</sub>   | 22 800                   |
| <b>Hydrofluorocarbon species (HFCs)</b> |   |                          |
| HFC-23                                  | CHF <sub>3</sub>  | 14 800                   |
| HFC-32                                  | CH <sub>2</sub> F <sub>2</sub>  | 675                      |
| HFC-41                                  | CH <sub>3</sub> F   | 92                       |
| HFC-43-10mee                            | C <sub>5</sub> H <sub>2</sub> F <sub>10</sub>   | 1 640                    |
| HFC-125                                 | C <sub>2</sub> HF <sub>5</sub>  | 3 500                    |
| HFC-134                                 | C <sub>2</sub> H <sub>2</sub> F <sub>4</sub><br>(Structure: CHF <sub>2</sub> CHF <sub>2</sub> ) | 1 100                    |
| HFC-134a                                | C <sub>2</sub> H <sub>2</sub> F <sub>4</sub><br>(Structure: CH <sub>2</sub> FCF <sub>3</sub> )  | 1 430                    |
| HFC-143                                 | C <sub>2</sub> H <sub>3</sub> F <sub>3</sub><br>(Structure: CHF <sub>2</sub> CH <sub>2</sub> F) | 353                      |
| HFC-143a                                | C <sub>2</sub> H <sub>3</sub> F <sub>3</sub><br>(Structure: CF <sub>3</sub> CH <sub>3</sub> )   | 4 470                    |
| HFC-152a                                | C <sub>2</sub> H <sub>4</sub> F <sub>2</sub><br>(Structure: CH <sub>3</sub> CHF <sub>2</sub> )  | 124                      |
| HFC-227ea                               | C <sub>3</sub> HF <sub>7</sub>  | 3 220                    |
| HFC-236fa                               | C <sub>3</sub> H <sub>2</sub> F <sub>6</sub>  | 9 810                    |
| HFC-245ca                               | C <sub>3</sub> H <sub>3</sub> F <sub>5</sub>  | 693                      |
| <b>Perfluorocarbon species (PFCs)</b>   |   |                          |
| Perfluoromethane                        | CF <sub>4</sub>   | 7 390                    |
| Perfluoroethane                         | C <sub>2</sub> F <sub>6</sub>   | 12 200                   |
| Perfluoropropane                        | C <sub>3</sub> F <sub>8</sub>   | 8 830                    |
| Perfluorobutane                         | C <sub>4</sub> F <sub>10</sub>  | 8 860                    |
| Perfluorocyclobutane                    | c-C <sub>4</sub> F <sub>8</sub>   | 10 300                   |
| Perfluoropentane                        | C <sub>5</sub> F <sub>12</sub>  | 9 160                    |
| Perfluorohexane                         | C <sub>6</sub> F <sub>14</sub>  | 9 300                    |

### 3 Specified Gas Report Submission

**3(1)** The specified gas reporter for a facility shall submit a specified gas report in respect of the release of specified gases from the facility in a year on or before June 1 of the following year.

(2) The specified gas reporter for a facility shall submit the specified gas report for the facility required by the Regulation to the Director by means of the SWIM system.

(3) A specified gas reporter shall submit the specified gas report, and statement of certification to the SWIM system no later than June 1 in the year that follows the year to which the specified gas report relates.

#### 4 Specified Gas Reporter and Facility Information

4(1) The specified gas reporter for a facility shall include all of the following in the specified gas report for the facility:

- (a) the specified gas reporter's Company legal name, company business number, telephone number and address;
- (b) the six digit North American Industry Classification System (NAICS) code for the facility;
- (c) the National Pollutant Release Inventory (NPRI) identification number for the facility, if applicable;
- (d) the facility name;
- (e) the location of the facility;
- (f) if the facility is owned by a subsidiary of a parent company:
  - i. the name of all parent companies of the subsidiary;
  - ii. the address of all parent companies of the subsidiary;
  - iii. the city of all parent companies of the subsidiary; and
  - iv. the percentage ownership of the subsidiary by each parent company;
- (g) the name, position, address and telephone number of the reporter, certifying official, and, if applicable, public contact for the facility's specified gas report submission;
- (h) the number of all approvals and registrations issued under the *Environmental Protection and Enhancement Act* with respect to the facility, if applicable; and
- (i) the first year of commercial operation of the facility.

## 5 Mandatory Specified Gas Emissions Information

**5(1)** The specified gas reporter for a facility shall include all of the following in the specified gas report for the facility for a year:

- (a) the amount, in tonnes, of emissions each of the specified gases listed in Column 2 of Table 2 released at the facility for each reported emissions category applicable to the facility listed in Column 1 of Table 2;
- (b) the amount, in tonnes, of direct emissions of each of the specified gases listed in Column 2 of Table 2 released at the facility for each reported emissions category applicable to the facility listed in Column 1 of Table 2;
- (c) the total electricity generated at the facility (net of station loads), expressed in MWh;
- (d) the total electricity consumed at the facility, expressed in MWh;
- (e) the total electricity imported at the facility, expressed in MWh;
- (f) the total electricity exported at the facility, expressed in MWh;
- (g) the amount, in tonnes, of total hydrogen imported at the facility (excluding trace hydrogen in fuels);
- (h) the amount, in tonnes, of total hydrogen exported at the facility (excluding trace hydrogen in fuels);
- (i) the amount, in GJ, of total heat imported at the facility;
- (j) the amount, in GJ, of total heat exported at the facility;
- (k) the total direct emissions from the cogeneration facility,
- (l) the total electricity generation (net of station loads) in MWh generated from the cogeneration facility,
- (m) the total net heat production in GJ produced from the cogeneration facility,
- (n) the deemed specified gas emissions from heat production in tonnes of CO<sub>2e</sub> from the cogeneration facility (detailed calculations for cogeneration information can be found in Appendix A);
- (o) the reporting data required by ECCC's *Notice with respect to reporting of greenhouse gases (GHGs) for 2017*; and,

- (p) indication of which methodology type was used in calculating or determining the amounts required by subsections (a), (b), (c) and (e) from the following:
- i. monitoring or direct measurement;
  - ii. mass balance;
  - iii. emission factor estimation; or
  - iv. engineering estimate.

Superseded

**Table 2:** Reported emissions categories and typical specified gas types

| <b>Column 1: Reported Emissions Categories</b> | <b>Column 2: Specified Gas Type</b>  |
|--|--|
| Stationary Fuel Combustion Emissions           | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Industrial Process Emissions                   | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, SF <sub>6</sub> , HFC & PFC by species |
| Venting  | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Flaring  | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Leakage Emissions                              | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| On-Site Transportation Emissions               | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Waste Emissions                                | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Wastewater Emissions                           | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Biomass CO <sub>2</sub> Emissions              | CO <sub>2</sub>  |
| CO <sub>2</sub> sent off site                  | CO <sub>2</sub>  |
| CO <sub>2</sub> geologically-injected on site  | CO <sub>2</sub>  |
| CO <sub>2</sub> received on site locations     | CO <sub>2</sub>  |
| Formation CO <sub>2</sub>                      | CO <sub>2</sub>  |
| Industrial Product Use                         | SF <sub>6</sub> , HFC & PFC by species   |

**Table 3:** Threshold emissions source categories and typical specified gas types

| <b>Column 1: Threshold Emissions Source Categories</b> | <b>Column 2: Specified Gas Type</b>  |
|--|--|
| Stationary Fuel Combustion Emissions                   | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Industrial Process Emissions                           | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, SF <sub>6</sub> , HFC & PFC by species |
| Venting  | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Flaring  | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Leakage Emissions                                      | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| On-Site Transportation Emissions                       | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Waste Emissions  | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Wastewater Emissions                                   | CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O   |
| Industrial Product Use                                 | SF <sub>6</sub> , HFC & PFC by species   |



## 6 Methodology

**6(1)** For the purposes of sections 2 and 5, the specified gas reporter shall use methodologies, emission factors, equations and calculations that are:

- (a) consistent with the guidelines approved for use by the United Nations Framework Convention on Climate Change (UNFCCC) for the Preparation of National Greenhouse Gas Emission Inventories by Annex 1 Parties (Decision 18/CP.8), and the annex to that decision contained in FCCC/CP/2002/8,

and

- (b) consistent with the Environment Canada Technical Guidance on Reporting Greenhouse Gas Emissions at this link:
  - <https://www.canada.ca/en/environment-climate-change/services/climate-change/publications/technical-guidance-reporting-greenhouse-gas.html>

and

- (c) for quantification of area leakage (fugitive) emissions from mine faces and tailings ponds, oil sands facilities must use the Guidance for the Quantification of Area Fugitive Emissions at Oil Sands Mines
  - <https://open.alberta.ca/publications/quantification-of-area-fugitive-emissions-at-oil-sands-mines-version-2-0>

**Note that Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation will be mandatory for the 2018 reporting period, and can be used as guidance for the 2017 reporting period.**

Any comments or questions regarding the content of this document may be directed to:

Alberta Climate Change Office  
Regulatory and Compliance Branch  
12th Floor, 10025 – 106 Street  
Edmonton, Alberta, T5J 1G4  
E-mail: [AEP.GHG@gov.ab.ca](mailto:AEP.GHG@gov.ab.ca)

Original signed by: \_\_\_\_\_

Date: May 28, 2018

Justin Wheler  
Executive Director  
Climate Change Regulatory and Compliance Branch  
Alberta Climate Change Office

## Appendix A – Cogeneration Calculations

- (a) Total specified gas emissions from cogeneration are calculated like other stationary fuel combustion sources. Fuel used for cogeneration needs to be clearly separated from other fuel use at the facility. Note that biomass CO<sub>2</sub> emissions are not included in the cogeneration emissions calculations.
- (b) Total cogeneration electricity generation is the net electricity that crosses the cogeneration boundary (exported to the host facility and the electricity grid) and is net of station loads (i.e. loads integral to the function of the cogeneration unit).
- (c) Deemed specified gas emissions from heat production are calculated according to the following methodology:
- i. The total heat production from cogeneration is calculated based on the difference between the total energy content of the heat product streams leaving the cogeneration boundary and the total energy content of the thermal streams entering the cogeneration boundary (these values would be aggregated over the reporting period to calculate a total net heat):

$$H = \sum_{i=1}^n \{h(out)_i \times M(out)_i\} - \sum_{i=1}^m \{h(in)_i \times M(in)_i\}$$

where:

|                     |   |   |         |
|---------------------|---|---|---------|
| H                   | = | Heat produced by the cogeneration facility  | [kJ]    |
| h(out) <sub>i</sub> | = | Enthalpy of i stream of heat product to the host facility                                 | [kJ/kg] |
| h(in) <sub>i</sub>  | = | Enthalpy of i thermal stream (i.e. condensate) returned to the cogeneration unit          | [kJ/kg] |
| M(out) <sub>i</sub> | = | Mass flow of i stream of heat product   | [kg]    |
| M(in) <sub>i</sub>  | = | Mass flow of i thermal stream (i.e. condensate) returned to the cogeneration unit         | [kg]    |
| n                   | = | Total number of output heat product streams   |         |
| m                   | = | Total number of input thermal streams (i.e. condensate) returned to the cogeneration unit |         |

- ii. Deemed specified emissions from heat production are determined from the input energy attributed to heat production based on a boiler thermal efficiency of 80 per cent on a higher heating value basis. This input energy is the energy derived from fuel combustion that is attributable to useable heat production:

$$E_H = \frac{H}{0.8}$$

where:

|       |   |  |      |
|-------|---|--|------|
| $E_H$ | = | Deemed input energy attributed to heat production                    | [GJ] |
| $H$   | = | Total heat produced within the cogeneration boundary during the year | [GJ] |

- iii. To calculate the fuel required to generate the deemed input energy:

$$M_H = \frac{E_H}{V}$$

where:

|       |   |   |                         |
|-------|---|---|-------------------------|
| $E_H$ | = | Deemed input energy attributed to heat production     | [GJ]                    |
| $M_H$ | = | Mass/volume of fuel deemed to be used to produce heat | [units of fuel used]    |
| $V$   | = | Fuel Higher Heating Value                             | [GJ/units of fuel used] |

Where multiple fuel sources are used, each source should be apportioned a fraction of the deemed input heat equal to the fraction of total fuel heat provided by the fuel source on a higher heating value basis.

- iv. The deemed specified gas emissions allocated to heat production are calculated according to:

$$D_H = F \times M_H$$

where:

$D_H$  = Deemed specified gas emissions from heat production [tonnes CO<sub>2</sub>e]

$F$  = Emission factor for the fuel used in the stand-alone boiler facility [tonnes CO<sub>2</sub>e/units of fuel used]

$MH$  = Mass/volume of fuel deemed to be used to produce heat [units of fuel used]

Superseded

## References

*Climate Change and Emissions Management Act*. Government of Alberta, 2007. Available from the Queen's Printer: <http://www.qp.alberta.ca>

Carbon Competitiveness Incentive (CCI) regulation. Government of Alberta, 2018. Available from Queen's Printer: <http://www.qp.alberta.ca>

GWP values from the IPCC 4th Assessment Report. Available from: [https://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/errataserrata-errata.html#table214](https://www.ipcc.ch/publications_and_data/ar4/wg1/en/errataserrata-errata.html#table214)

Intergovernmental Panel on Climate Change. United Nations Environment Programme, 2006. <http://www.ipcc.ch>

Specified Gas Reporting Regulation. Government of Alberta, 2017. Available from the Queen's Printer: <http://www.qp.alberta.ca>

Technical Guidance on Reporting Greenhouse Gas Emissions, Environment Canada, 2016. <https://www.canada.ca/en/environment-climate-change/services/climate-change/publications/technical-guidance-reporting-greenhouse-gas.html>

Greenhouse gas emissions: quantification guidance, Environment Canada, 2017. <https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/quantification-guidance.html>