Title V and Greenhouse Gases Fact Sheet

Am I subject to Title V permitting requirements because of my greenhouse gas emissions?

As of July 1, 2011, per the Federal Environmental Protection Agency (EPA), Greenhouse Gases (GHG) is considered a regulated pollutant for sources with a potential to emit greater than 100,000 short tons on a carbon dioxide equivalent (CO\textsubscript{2e}) basis. If regulated, the source becomes a Major Source subject to Title V permitting for GHG if it has a potential to emit greater than 100 short tons of GHG on a mass basis. Note that for Title V, emissions are calculated using short tons, not metric tons (as is usual for GHG).

For Title V regulations, GHG’s include the following six “well-mixed” compounds: carbon dioxide (CO\textsubscript{2}), methane (CH\textsubscript{4}), nitrous oxide (N\textsubscript{2}O), perfluorocarbons (PFC), hydrofluorocarbons (HFC), and sulfur hexafluoride (SF\textsubscript{6}).

EPA has guidance available at [http://www.epa.gov/nsr/ghgpermitting.html](http://www.epa.gov/nsr/ghgpermitting.html). Please note that this page includes both Title V permitting and Prevention of Significant Deterioration (PSD) permitting.

If you would like help in determining if your facility is subject to Title V, what you can do to avoid Title V, or guidance through the application process if you must obtain a Title V permit, please call one of our Small Business Assistance staff at one of the numbers listed below.

- Modesto: (209) 557-6446
- Fresno: (559) 230-5888
- Bakersfield: (661) 392-5665

Should your facility need to apply for a Title V permit, applications must be submitted by June 28, 2012. Forms are available at the following link:


Calculating GHG on a Carbon Dioxide Equivalent (CO\textsubscript{2e}) Basis

Carbon dioxide equivalents are found by multiplying the mass emissions of a GHG by its global warming potential (GWP). For Title V purposes, the GWP are taken from the Mandatory Reporting Rule found in 40 CFR Part 98, Subpart A, Table A-1. There is a table at the end of this fact sheet detailing the GWP of the 6 GHG included in Title V. The full table is available at the following link:

[http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr98_main_02.tpl](http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr98_main_02.tpl)
Calculating GHG on a Mass Basis

EPA has established default GHG emission factors for combustion sources in 40 CFR Part 98, Subpart A, Tables C-1 and C-2 at the following link:

http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr98_main_02.tpl

Sample Calculations

**Example 1:** For a company with one natural gas fired, 100 MMBtu/hr boiler, allowed to operate 24/7 (8760 hours per year).

The GHG emissions factors are:
- CO₂: 116.5 lb/MMBtu
- CH₄: 0.002 lb/MMBtu
- N₂O: 0.0002 lb/MMBtu

Step 1: Calculate the CO₂e emissions, to see if GHG are a regulated pollutant for this facility.

\[
\text{CO}_2 = 100 \text{ MMBtu/hr} \times 8760 \text{ hr/yr} \times 116.5 \text{ lb/MMBtu} \times 1 \text{ lb CO}_2e/1 \text{ lb CO}_2 \times 1 \text{ ton/2,000 lb} \\
= 51,027 \text{ tons CO}_2e
\]

\[
\text{CH}_4 = 100 \text{ MMBtu/hr} \times 8760 \text{ hr/yr} \times 0.002 \text{ lb/MMBtu} \times 21 \text{ lb CO}_2e/1 \text{ lb CH}_4 \times 1 \text{ ton/2,000 lb} \\
= 18.4 \text{ tons CO}_2e
\]

\[
\text{N}_2\text{O} = 100 \text{ MMBtu/hr} \times 8760 \text{ hr/yr} \times 0.0002 \text{ lb/MMBtu} \times 310 \text{ lb CO}_2e/1 \text{ lb N}_2\text{O} \times 1 \text{ ton/2,000 lb} \\
= 27.2 \text{ tons CO}_2e
\]

\[
\text{CO}_2e = 51,027 + 18.4 + 27.2 \\
= 51,072.6 \text{ tons CO}_2e
\]

As this amount is less than 100,000 tons CO₂e, GHG are not a regulated pollutant for this facility, and a Title V permit is not required.

**Example 2:** For a company with one natural gas fired, 300 MMBtu/hr boiler, limited to an annual fuel consumption of 2,450,000 MMBtu/yr to keep from being a Major Source of NOx.

Use the same GHG emission factors from Example 1.

Step 1: Calculate the CO₂e emissions, to see if GHG are a regulated pollutant for this facility.

\[
\text{CO}_2 = 2,450,000 \text{ MMBtu/yr} \times 116.5 \text{ lb/MMBtu} \times 1 \text{ lb CO}_2e/1 \text{ lb CO}_2 \times 1 \text{ ton/2,000 lb} \\
= 142,712.5 \text{ tons CO}_2e
\]
\[
\text{CH}_4 = 2,450,000 \text{ MMBtu/yr} \times 0.002 \text{ lb/MMBtu} \times 21 \text{ lb CO}_{2e}/1 \text{ lb CH}_4 \times 1 \text{ ton/2,000 lb} \\
= 51.5 \text{ tons CO}_{2e}
\]
\[
\text{N}_2\text{O} = 2,450,000 \text{ MMBtu/yr} \times 0.0002 \text{ lb/MMBtu} \times 310 \text{ lb CO}_{2e}/1 \text{ lb N}_2\text{O} \times 1 \text{ ton/2,000 lb} \\
= 76 \text{ tons CO}_{2e}
\]
\[
\text{CO}_{2e} = 142,712.5 + 51.5 + 76 \\
= 142,840 \text{ tons CO}_{2e}
\]

As this amount is greater than 100,000 tons CO\text{e}, GHG are a regulated pollutant for this facility, and a Title V permit will be required if it is a Major Source for GHG.

Step 2: Calculate the GHG mass emissions to see if the facility is a Major Source.

\[
\text{CO}_2 = 2,450,000 \text{ MMBtu/yr} \times 116.5 \text{ lb/MMBtu} \times 1 \text{ ton/2,000 lb} \\
= 142,712.5 \text{ tons CO}_2
\]
\[
\text{CH}_4 = 2,450,000 \text{ MMBtu/yr} \times 0.002 \text{ lb/MMBtu} \times 1 \text{ ton/2,000 lb} \\
= 2.5 \text{ tons CH}_4
\]
\[
\text{N}_2\text{O} = 2,450,000 \text{ MMBtu/yr} \times 0.0002 \text{ lb/MMBtu} \times 1 \text{ ton/2,000 lb} \\
= 0.3 \text{ tons N}_2\text{O}
\]
\[
\text{GHG} = 142,712.5 + 2.5 + 0.3 \\
= 142,715.3 \text{ tons GHG}
\]

As this amount is greater than 100 tons, this facility is a Major Source for GHG emissions, and is subject to Title V permitting. Note that if they could reduce their permitted annual fuel consumption enough, their CO\text{e} potential to emit could be reduced to below 100,000 tons/yr, and they would no longer be subject to Title V permits.
### 40 CFR Part 98, Subpart A, Table A-1

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No.</th>
<th>Chemical formula</th>
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<td>Carbon dioxide</td>
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<td>Methane</td>
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<td>Sulfur hexafluoride</td>
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