

# **Greenhouse Gas Reporting Program – Requirements for Underground Coal Mines (Subpart FF)**

Updated February 2014



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# Outline



- I. Background and General Rule Requirements (applicability, reporting, monitoring, and recordkeeping)
- II. Subpart FF- Underground Coal Mines
- III. Subpart C- Stationary Fuel Combustion
- IV. Appendix: Frequently Asked Questions



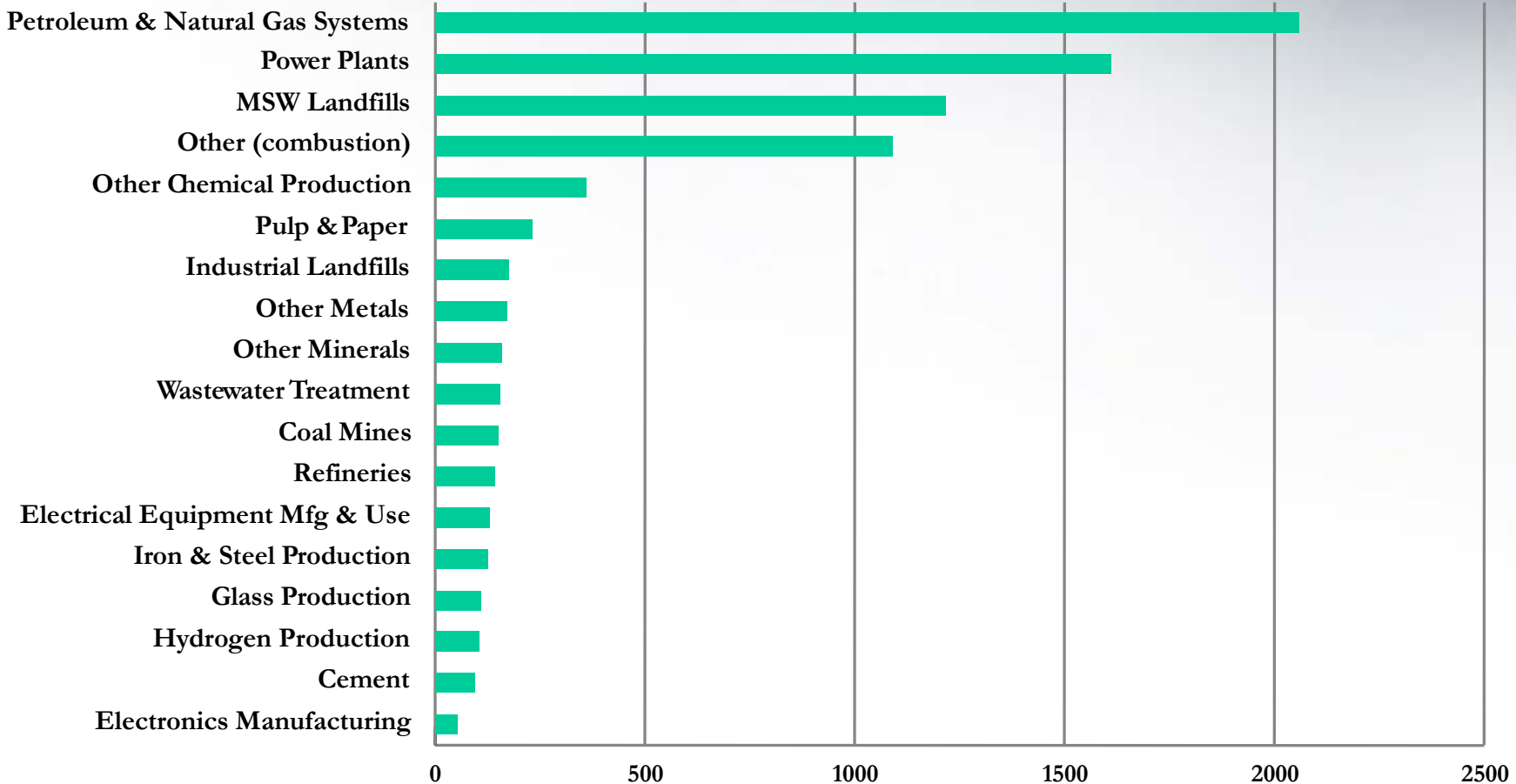
# **I. Background and General Rule Requirements**

# Purpose of 40 CFR Part 98



- Part 98 requires reporting of greenhouse gas (GHG) information from certain source categories in the United States
  - Better understand relative emissions of specific industries, and of individual facilities within those industries
  - Better understand factors that influence GHG emission rates and actions facilities could take to reduce emissions
- Does not require control of GHG

# Over 8,000 U.S. Facilities Provided Data to EPA in 2012



# Key Elements of Part 98



- Annual reporting of GHG by:
  - Direct emitting source categories
  - Suppliers of certain products that would result in GHG emissions if released, combusted, or oxidized
  - Injection and geologic sequestration of carbon dioxide
- 25,000 metric tons CO<sub>2</sub>e or more per year reporting threshold for most sources; capacity-based thresholds where feasible (including for subpart FF)
- Direct reporting to EPA electronically
- EPA verification of data

# What GHGs are Reported?



- $\text{CO}_2$
- $\text{CH}_4$  (methane)
- $\text{N}_2\text{O}$  (nitrous oxide)
- **Fluorinated GHGs**
  - HFCs (hydrofluorocarbons)
  - PFCs (perfluorocarbons)
  - $\text{SF}_6$  (sulfur hexafluoride)
  - Other fluorinated gases (except CFC and HCFC and gases  $<1$  mm Hg @25° C)



# What is CO<sub>2</sub>e?



- GHGs have varying heat-trapping ability and atmospheric lifetimes.
- Global warming potential (GWP) is a metric used to compare emissions among GHGs.
- The GWP of CO<sub>2</sub> is 1.0, and the GWP of other GHGs are expressed relative to CO<sub>2</sub>
  - For example, CH<sub>4</sub> has a GWP of 21 (25 starting in 2014)\*. Each metric ton of CH<sub>4</sub> emissions would have 21 (25 starting in 2014) times as much impact on global warming (over a 100-year time horizon) as a metric ton of CO<sub>2</sub> emissions.
- Mass emissions x GWP = CO<sub>2</sub>e (metric tons)

Table A-1 of Subpart A lists GWPs

\*The GWP for CH<sub>4</sub> for Reporting Years 2011, 2012 and 2013 is 21, but has been increased to 25 for Reporting Year 2014 and after to be consistent with the IPCC *4th Assessment Report*



# **Applicability**

# **Applicability for Direct Emitters is Facility-based**



A facility is defined as...

- Physical property, plant, building, structure, source, or stationary equipment;
- on contiguous or adjacent properties;
- in actual physical contact or separated solely by public roadway or other public right of way; and
- under common ownership or common control

# Assessing Applicability to the Rule



- A single facility may have multiple emission source categories, and thus be required to report under multiple rule subparts.
- You must evaluate each source category to assess applicability to the rule.
- If the rule applies to any source category, report emissions for all source categories for which methods are provided in the rule.



# **Table 1: All-in Source Categories**

**Electricity Generation if report  
CO<sub>2</sub> year-round through Part 75**

**Adipic Acid Production**

**Aluminum Production**

**Ammonia Manufacturing**

**Cement Production**

**Fluorinated GHG processes\***

**HCFC-22 Production/**

**HFC-23 Destruction Processes**

**Lime Manufacturing**

**Nitric Acid Production**

**Petrochemical Production**

**Petroleum Refineries**

**Phosphoric Acid Production**

**Silicon Carbide Production**

**Soda Ash Production**

**Titanium Dioxide Production**

**Municipal Solid Waste Landfills**

**Manure Management Systems\***

**Underground coal mines**

**liberating 36,500,000 actual  
cubic feet of CH<sub>4</sub> or more per year**

\*EPA will not be implementing subpart JJ of 40 CFR part 98 using funds provided in its FY2010 appropriations or Continuing Appropriations Act, 2011 (Public Law 111-242), due to a Congressional restriction prohibiting the expenditure of funds for this purpose.

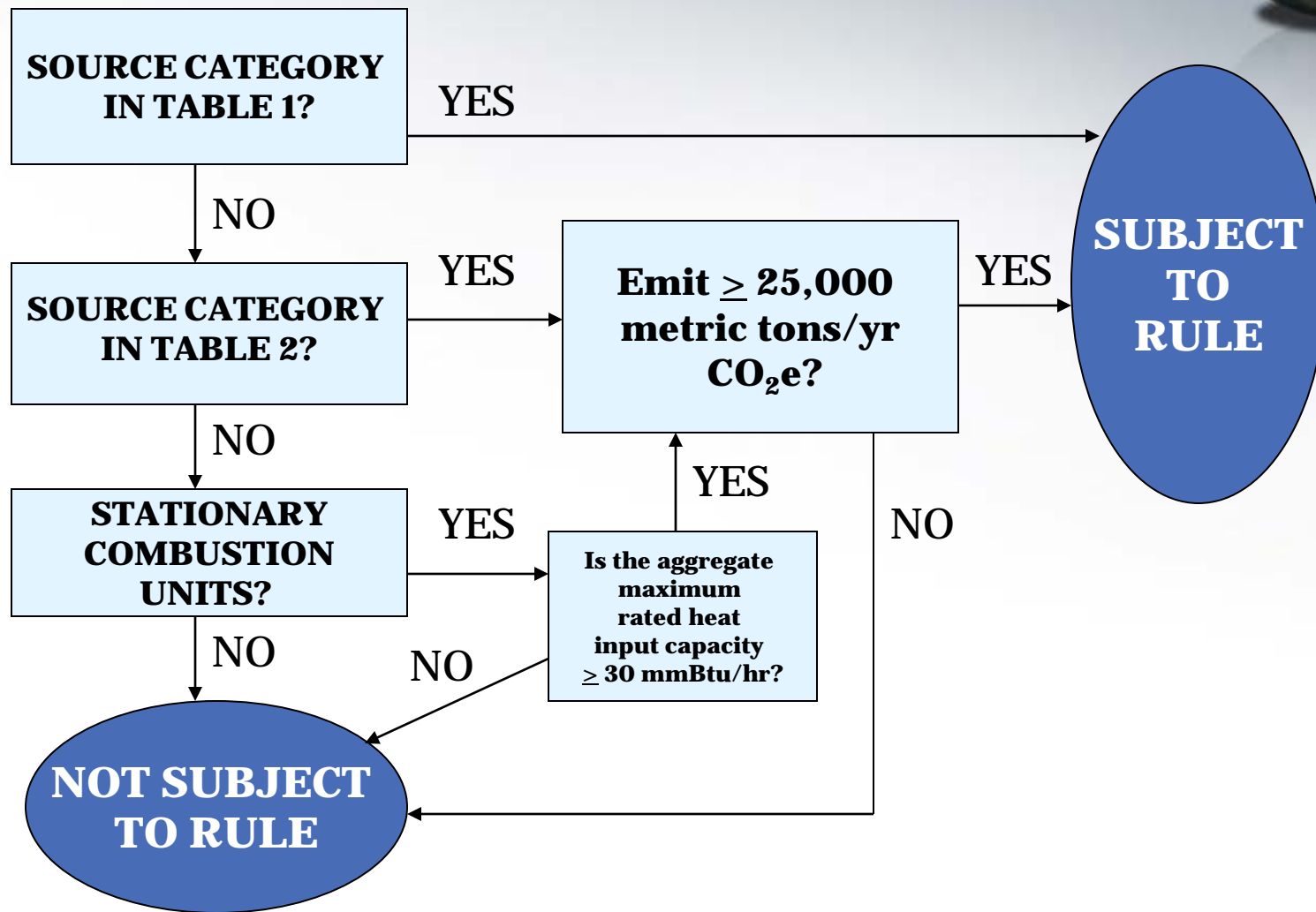


## **Table 2: Threshold Source Categories<sup>1</sup>**

Electronics Production	Lead Production
Ferroalloy Production	Magnesium Production
Fluorinated GHG Production	Petroleum and Natural Gas systems
Glass Production	Pulp and Paper Manufacturing
Hydrogen Production	Zinc Production
Industrial Wastewater Treatment	
Industrial Waste Landfills	
Iron and Steel Production	

<sup>1</sup>  $\geq 25,000$  metric tons CO<sub>2</sub>e per year from all source categories, combustion units, and miscellaneous use of carbonates.

# Does the Rule Apply to My Facility?



# What Combustion Units May Emit 25,000 MT CO<sub>2</sub>e per year?



Fuel	Maximum Design Capacity <sup>1</sup> (mmBtu/hr)	Annual fuel Use
Coal	30	10,800 tons
Fuel Oil	35	2.3 million gallons
Natural Gas	50	460 million ft <sup>3</sup>

<sup>1</sup>Assuming full utilization and 8,760 hours/yr.



# Who reports emissions from coal mine CH<sub>4</sub>-fired engines, boilers, etc?



- It depends on the location of the mine with respect to the combustion devices.
- Coal mine “facility” = contiguous or adjacent property under common ownership or common control (see full definition in 98.6)
- If the coal mine and combustion devices are part of a single “facility”, then the owner/operator must submit a single report with the following:
  - CH<sub>4</sub> and CO<sub>2</sub> emissions as required by subpart FF.
  - CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from combustion devices (excluding flares) as required by subpart C, Stationary Fuel Combustion Sources.
  - Emissions from any other source category for which methods are provided in the rule.

# Who reports emissions from CH<sub>4</sub>-fired engines, boilers, etc. (cont'd)?



- If the coal mine and the combustion devices are at separate facilities:
  - Coal mine facility reports CH<sub>4</sub> and CO<sub>2</sub> as required by subpart FF.
  - Facility with the combustion devices reports CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O from combustion devices as required by subpart C (Stationary Fuel Combustion sources), *if* that facility is subject to the rule.

# Applicability Example #1



Facility Description	Required to Report?	Explanation
<p>A mine liberates 35,000,000 actual cubic feet of CH<sub>4</sub> per year.</p> <p>Includes a stationary combustion device which emits 26,500 mtCO<sub>2</sub>e/year</p>	<p>No for subpart FF</p> <p>Yes for subpart C</p>	<p>The facility must report combustion emissions under subpart C. Emissions from ventilation, degasification, and destruction under subpart FF need not be reported because facilities that are subject to the rule ONLY due to stationary fuel combustion units are required to report emission from the combustion units only.</p>

# Applicability Example #2



Facility Description	Required to Report?	Explanation
<p>A Mine liberates more than 37,000,000 actual cubic feet of CH<sub>4</sub> per year.</p> <p>Includes a stationary combustion unit which emits 15,000 mtCO<sub>2</sub>e/year</p>	<p>Yes for subpart FF</p> <p>Yes for subpart C</p>	<p>The facility is subject to reporting for subpart FF due to the amount of CH<sub>4</sub> liberated, so the facility must report stationary fuel combustion emissions regardless of the magnitude of combustion emissions (subject to any exclusions in subpart C).</p>

# Applicability Tool



To help determine if facilities must report...

- Check-off list of source categories
- Combustion calculator

<http://www.epa.gov/ghgreporting/help/tool2014/index.html>



# **General Reporting, Monitoring, and Recordkeeping Requirements**

# What are the Reporting Requirements?



- **Subpart A: General Provisions**
  - Applicability provisions
  - Schedule
  - Reporting and recordkeeping requirements common to all reporters
  - Definitions
  - Report submission procedures
  - Other (e.g., calibration procedures, monitoring plan)
- **Subparts C through UU: Source-Specific Requirements**
  - Definition of source category
  - GHG to report
  - Calculation methods
  - Monitoring and QA/QC
  - Missing data procedures
  - Reporting and recordkeeping elements unique to each subpart

# What Do Facilities Report?



- Identifying information
- Annual GHG emissions excluding biomass CO<sub>2</sub>, metric tons CO<sub>2</sub>e
- Annual CO<sub>2</sub> emissions from biomass combustion, metric tons
- Annual emissions of each GHG for each source category, metric tons each gas
- Other emissions data required by an applicable subpart (e.g., by unit or process line)
- Data elements for which a missing data procedure was used
- Certification by the “Designated Representative”



# What Is Not Reported?



- Indirect emissions (e.g., electricity use)
- Mobile source emissions (e.g., fleet emissions)
- Emission offsets

# **Retain These Records for 3 Years:**



- List of all units, operations, processes, and activities for which GHG emission were calculated
- All data used to calculate the GHG emissions for each unit, operation, process, and activity, categorized by fuel or material type
- The annual GHG reports
- Missing data computations
- Written GHG Monitoring Plan
- Certification and QA tests
- Maintenance records for measurement equipment
- Other data required by applicable subparts

# Monitoring Plan



- Identifies responsibilities (i.e., job titles) for data collection
- Explains processes and methods used for data collection
- Describes QA/QC procedures for monitors
- May rely on references to existing corporate documents (e.g., existing QA plans, standard operating procedures)
- Subpart FF reporters were required to have their monitoring plans in place by January 1, 2011

# How Will Emissions Be Verified?



- **Self certification**
  - Designated representative certifies and submits report
  - Rule allows one designated representative for each facility and supplier
- **EPA verification**
  - Reports submitted through an electronic system
  - Built-in calculation and completeness checks for reporters
  - Electronic QA and consistency checks

# Electronic Reporting System



- All reporting under the GHG Reporting Program is electronic using EPA's Electronic Greenhouse Gas Reporting Tool (e-GGRT).
- Web-based system for facility/supplier to EPA reporting
  - Web-forms guide reporters through data entry and submission.
  - Includes a mechanism to submit file directly using Extensible Markup Language (XML) format.
- For e-GGRT information and training opportunities, including e-GGRT information specific to subpart FF, visit :  
<http://www.epa.gov/climatechange/emissions/data-reporting-system.html>



## **II. Subpart FF- Underground Coal Mines**

# **Subpart FF- Module topics**



- i. Applicability: who is subject to Subpart FF?**
- ii. Greenhouse gases to be reported**
- iii. Emissions monitoring and estimation methods**
- iv. Reporting and recordkeeping requirements**



**i. Applicability:**  
**Who is subject to Subpart FF?**



# Which coal mines must report?



- **Underground coal mines**
  - Defined in in Subpart A, 40 CFR 98.6, definition of “Facility,” and in Subpart FF, 40 CFR 98.320(a), “Definition of the source category”:
- **40 CFR 98.320(a)**
  - “Mine at which coal is produced by tunneling into the earth to the coalbed, which is then mined with underground mining equipment such as cutting machines and continuous, longwall, and shortwall mining machines, and transported to the surface.”
  - **Mine must be active**
    - (1) Mine development is underway;
    - (2) Coal has been produced within the last 90 days;
    - (3) Mine personnel are present in the mine workings;
    - (4) Mine ventilation fans are operative; **or**
    - (5) The mine is designated as an “intermittent” mine by MSHA.
- **Mine meets the reporting threshold of 36,500,000 actual cubic feet of CH<sub>4</sub> or more per year**

# Which coal mines must report? (cont'd)



- **This source category does not include:**
  - Abandoned (closed) mines
  - Surface coal mines
  - Post-coal mining activities (e.g., storage or transportation of coal), or
  - Coalbed methane (CBM) recovery from coal seams not associated with active underground coal mines

# Provisions to Cease Reporting



- A mine covered by the rule that later ceases coal production would need to continue reporting until its emissions fell below the levels specified in the provisions to cease reporting in 40 CFR part 98, subpart A.
  - If annual reports demonstrate CO<sub>2</sub> e <25,000 metric tons/yr for 5 consecutive years.
  - If annual reports demonstrate CO<sub>2</sub> e <15,000 metric tons/yr for 3 consecutive years.



## **ii. Greenhouse Gases (GHGs) to be reported**

# GHGs to be reported



Mines subject to Subpart FF must report these sources of greenhouse gases:

1. CH<sub>4</sub> *liberated*\* from mine ventilation and degasification systems
2. CH<sub>4</sub> destruction from systems where gas is sold, used onsite, or otherwise destroyed (including by flaring and VAM oxidation)
3. Net CH<sub>4</sub> emissions from ventilation and degasification systems (CH<sub>4</sub> liberated less CH<sub>4</sub> destroyed)
4. CO<sub>2</sub> emissions from coal mine CH<sub>4</sub> destruction occurring at the facility, where the gas is not a fuel input for energy generation or use. (This applies primarily to CH<sub>4</sub> that is flared or Ventilation Air Methane (VAM) oxidation.)
5. If applicable, emissions from other sources on site, such as stationary combustion

\**Liberated* means released from coal and surrounding rock strata during the mining process. This includes both methane released from the ventilation system and methane drained from degasification systems.



### **iii. Emissions Monitoring and Estimation Methods**

- A. CH<sub>4</sub> liberated from ventilation systems
- B. CH<sub>4</sub> liberated from drainage systems
- C. CH<sub>4</sub> destruction
- D. Net CH<sub>4</sub> emissions
- E. CO<sub>2</sub> emissions from coal mine methane destruction

# A. Ventilation systems - Monitoring and estimating CH<sub>4</sub> liberated



- **For CH<sub>4</sub> liberated from mine ventilation air, facilities have two possible methods to monitor CH<sub>4</sub>:**
  1. Quarterly sampling of CH<sub>4</sub> content and gas flow, or
  2. Use of continuous emissions monitoring systems (CEMS)
- **For the quarterly sampling method, coal mine operators are required to either:**
  1. Obtain the results from the testing that MSHA conducts, and use these results to estimate quarterly CH<sub>4</sub> emissions, or
  2. Independently collect samples of CH<sub>4</sub> released from the ventilation system(s), using MSHA procedures, have these samples analyzed for CH<sub>4</sub> composition, and use the results to estimate quarterly CH<sub>4</sub> emissions
- **If operators use CEMS as the basis for emissions reporting, they must provide documentation on the process for using the data obtained from their CEMS for estimating emissions**

# A. Estimating ventilation system CH<sub>4</sub> liberated (Eq. FF-1)



$$CH_{4V} = n * \left( V * MCF * \frac{C}{100\%} * 0.0423 * \frac{520^{\circ}R}{T} * \frac{P}{1 \text{ atm}} * 1,440 * \frac{0.454}{1,000} \right)$$

Variable	Description	Units
CH <sub>4V</sub>	Quarterly CH <sub>4</sub> liberated from the ventilation monitoring point (metric tons CH <sub>4</sub> ).	metric tons
V	Volumetric flow rate for the quarter (cfm) based on sampling or a flow rate meter. If a flow rate meter is used and the meter automatically corrects for temperature and pressure, replace "520°R/T × P/1 atm" with "1".	cubic feet per minute
MCF	Moisture correction factor for the measurement period, volumetric basis.	
C	CH <sub>4</sub> concentration of ventilation gas for the quarter (%).	%,
n	The number of days in the quarter where active ventilation of mining operations is taking place at the monitoring point.	
T	Temperature at which flow is measured for the quarter.	Degrees R
P	Absolute pressure at which flow is measured for the quarter. The annual average barometric pressure from the nearest NOAA weather service station may be used as a default.	atm

- If a facility has more than one ventilation monitoring point, the facility must calculate total CH<sub>4</sub> liberated from ventilation systems as the sum of the CH<sub>4</sub> from all ventilation monitoring points in the mine.



# **B. Degasification systems - monitoring and estimating CH<sub>4</sub> liberated**



- For CH<sub>4</sub> liberated from degasification systems, facilities are to monitor CH<sub>4</sub> using either:
  1. Weekly sampling, or
  2. CEMS
- Weekly sampling method described in more detail later.
- For the CEMS method, facilities can either:
  - Monitor each individual wellbore, or
  - Monitor at points of aggregation. (As long as emissions from all wells are addressed, and the methodology for estimating total CH<sub>4</sub> emissions from all wells is documented.)

# B. Estimating degasification system CH<sub>4</sub> liberated (Eq. FF-3)



$$CH_{4D} = \sum_{i=1}^n \left( V_i * MCF_i * \frac{C_i}{100\%} * 0.0423 * \frac{520^\circ R}{T_i} * \frac{P_i}{1 \text{ atm}} * 1,440 * \frac{0.454}{1,000} \right)$$

Variable	Description	Units
CH <sub>4D</sub>	Weekly CH <sub>4</sub> liberated from at the monitoring point	metric tons
V <sub>i</sub>	Measured volumetric flow rate for the days in the week when the degasification system is in operation at that monitoring point, based on sampling or a flow rate meter. If a flow rate meter is used and the meter automatically corrects for temperature and pressure, replace "520°R/T <sub>i</sub> × P <sub>i</sub> /1 atm" with "1".	cubic feet per minute
MCF <sub>i</sub>	Moisture correction factor for the measurement period, volumetric basis.	
C <sub>i</sub>	CH <sub>4</sub> concentration of gas for the days in the week when the degasification system is in operation at that monitoring point .	%
n	The number of days in the week that the system is operational at that measurement point.	
T <sub>i</sub>	Temperature at which flow is measured.	Degrees R
P <sub>i</sub>	Absolute pressure at which flow is measured. The annual average barometric pressure from the nearest NOAA weather service station may be used as a default.	atm

- If a facility has more than one degasification monitoring point, the facility must estimate total CH<sub>4</sub> liberated from degasification systems as the sum of the CH<sub>4</sub> from all degasification monitoring points in the mine.

## **B. Collecting samples from degasification systems**



- The method of collecting weekly samples includes both measurement of the total gas volume liberated, along with measurements of CH<sub>4</sub> concentrations in gas volumes recovered or emitted.
  - This includes gas that is emitted or sold, used onsite, or otherwise destroyed
- Facilities must determine weekly gas flow rates and CH<sub>4</sub> either on an individual well, or in aggregate at one or more centralized collection points.
- CH<sub>4</sub> composition could be determined either by submitting samples to a lab for analysis, or from the use of methanometers at the degasification well site(s) and/or one or more centralized collection point(s).

## **B. Monitoring and reporting emissions from degasification systems**



- For each degasification system monitoring point, you must estimate the weekly CH<sub>4</sub> liberated from the mine at that measurement point
  - These monitoring points could be each degasification well and/or vent hole, or at more centralized points into which CH<sub>4</sub> from multiple wells and/or vent holes are collected
- Emissions from each monitoring point must be summed for all monitoring points in the mine
- Emissions determined weekly must be summed over the quarter to report quarterly emissions

## C. Monitoring of CH<sub>4</sub> destruction



For all systems with **on-site** CH<sub>4</sub> destruction (e.g., power generation, coal drying, mine heating, other combustion, flaring, ventilation air oxidation):

- CH<sub>4</sub> destruction is monitored through direct measurement of CH<sub>4</sub> flow to combustion devices with continuous monitoring systems.
- The resulting CO<sub>2</sub> emissions are to be calculated from these monitored values.

# C. Determining destruction efficiency



- Destruction efficiency must be determined for both **onsite** and **offsite** destruction:
  - **Onsite** destruction: Use combustion device manufacturer's specified destruction efficiency or 0.99 (whichever is less).
  - **Offsite** destruction: If gas is transported offsite for destruction (e.g., sold to pipeline), use 1.0. This is because none of the recovered gas is emitted at the mine.
- The reporting facility must also determine the fraction of hours the ventilation/degasification systems and gas destruction device were operating during the year.



## **D. Reporting net CH<sub>4</sub> emissions**

- Net quarterly and annual CH<sub>4</sub> emissions for the entire mine and separately from each ventilation and degasification system must be reported.
- This estimate must include degasification systems deployed before, during, or after mining operations are conducted in a mine area, but gas liberation, destruction and net emissions are calculated only for the reporting year.
- Net CH<sub>4</sub> emissions  
= CH<sub>4</sub> liberated minus CH<sub>4</sub> in gas that is sold, used onsite, or otherwise destroyed

# **E. CO<sub>2</sub> emissions from coal mine methane destruction**



- Subpart FF contains methods to calculate CO<sub>2</sub> emissions from coal mine methane destroyed on site and which excludes energy generation or use (e.g., flaring or destruction-only ventilation air oxidation )
  - Where coal mine methane is a fuel input for energy generation or use, emissions are monitored and reported under Subpart C .
- Quarterly and annual CO<sub>2</sub> from this source is reported
- CO<sub>2</sub> is calculated by multiplying the quantity of CH<sub>4</sub> destroyed onsite (and is not a fuel input for energy generation or use) by an emission factor





## **iv. Reporting and recordkeeping requirements**

# Steps for Monitoring and Reporting for Subpart FF



<b>Step 1</b>	<b>Complete Monitoring Plan (does not have to be submitted)</b>
	<b>Start collecting data using required methods</b>
	<b>Monitors installed and calibrated [see § 98.3(i) for exceptions]</b>
<b>Step 2</b>	<b>Complete data collection for the reporting year (January through December)</b>
<b>Step 3</b>	<b>Create an account in electronic reporting tool, e-GGRT, and submit certificate of representation</b>
<b>Step 4</b>	<b>Register each facility in e-GGRT</b>
<b>Step 5</b>	<b>Submit GHG report by March 31<sup>st</sup> following the end of the reporting year (3 months)</b>
<b>Ongoing</b>	<b>Submit corrected report 45 days after notification of error(s)</b>
<b>Note</b>	<b>A new reporting form is required for Subpart FF for RY 2013 onward. Revisions to RY 2011 &amp; 2012 reports submitted after 2/7/14 must use the new form</b>

# What must be reported by all underground coal mines?



- Information required by 98.3(c) of subpart A
- MSHA ID number (if more than one MSHA ID for the reporting facility, the report must include all MSHA ID numbers)
- A description of all ventilation, degasification, and destruction systems
- Identification information and description for each well and shaft, including identification of whether the well or shaft is monitored individually, or as part of a centralized monitoring point.
- For each centralized monitoring point, identification of the wells and shafts included in the point.
- Quarterly volumetric flow rate for each ventilation monitoring point (acfm or scfm), date and location of each measurement, and method of measurement.
- Quarterly CH<sub>4</sub> concentration for each ventilation monitoring point, dates and locations of each measurement and method of measurement.
- Dates in quarterly reporting period where active ventilation of mining operations is taking place.

# What must be reported by all underground coal mines? (cont')



- Dates in quarterly reporting period when continuous monitoring equipment is not properly functioning, if applicable.
- Temperatures ( $^{\circ}$  R) and absolute pressure (atm) at which each sample is collected, and the moisture content of the  $\text{CH}_4$ .
- Whether  $\text{CH}_4$  volumetric flow and concentration are measured on a wet or dry basis
  - if different, a moisture correction factor is applied
- Quarterly  $\text{CO}_2$  emissions from onsite destruction of coal mine gas  $\text{CH}_4$ , where the gas is not a fuel input for energy generation or use (e.g., flaring, VAM oxidation)
- All elements included in e-GGRT are required reporting elements.

# Calibration Requirements



- All fuel flow meters, gas composition monitors, and heating value monitors used to provide data for the GHG emissions calculations shall be calibrated prior to the first reporting year, using methods specified in Section 98.324(e).
  - Similar specifications for fuel and flare flow meters
- Alternatively, calibration procedures specified by the equipment manufacturers may be used.
- This equipment must be recalibrated either annually or at the minimum frequency specified by the manufacturer, whichever is more frequent.
- In addition to the information required by § 98.3(g), you must retain the calibration records for all monitoring equipment, including the method or manufacturer's specification used for calibration.

# What must be reported by mines with degasification systems?



- Weekly volumetric flow used to calculate CH<sub>4</sub> liberated from degasification systems (acfm or scfm) and method of measurement.
- As appropriate:
  - CEMS CH<sub>4</sub> concentration (%) used to calculate CH<sub>4</sub> liberated from degasification systems (average from daily data), **or**
  - Quarterly CH<sub>4</sub> concentration data based on results from weekly sampling data.
- Dates in quarterly reporting period where degasification of mining operations is taking place.
- Temperatures (° R) and absolute pressure (atm) at which each sample is collected, and the moisture content of the CH<sub>4</sub>
- Whether CH<sub>4</sub> volumetric flow and concentration are measured on a wet or dry basis
  - if different, a moisture correction factor is applied
- For recovered gas, the ultimate disposition of the gas
  - E.g., sold to pipeline, consumed for energy on site, flared

# What must be reported by mines with gas destruction systems?



- For each destruction device:
  - A description of the device
    - Including an indication of whether destruction occurs at the coal mine
    - Weekly volumetric flow used to calculate CH<sub>4</sub> destruction for each destruction device and each point of offsite transport (scf).
    - Weekly CH<sub>4</sub> concentration (%) used to calculate CH<sub>4</sub> destruction.
  - If destruction occurs **at the mine (onsite)**:
    - Also report an indication of whether one or more back-up destruction devices are present at the mine,
    - The annual operating hours for the primary destruction device,
    - The annual operating hours for the back-up destruction device(s) (if present), and
    - The destruction efficiencies assumed for each destruction device (percent).

# What must be recorded?



- Information required by 98.3(g) of subpart A
- Calibration records for all monitoring equipment, including the method or manufacturer's specification used for calibration
- Records of gas sales
- Logbooks of parameter measurements
- Laboratory analyses of samples



# Missing data calculation procedures



- If data for CH<sub>4</sub> content, gas flow rate, temperature, moisture, or pressure are missing:
  - Substitute data value shall be the arithmetic average of the quality-assured values of that parameter immediately preceding and immediately following the missing data incident.
  - If no quality-assured data are available prior to the missing data incident, substitute data value shall be the first quality-assured value obtained after the missing data period.



# **III. Subpart C- Stationary Fuel Combustion Sources**

# What Units are Covered?



- **Devices that combust solid, liquid, or gaseous fuel for:**
  - producing electricity, generating steam, or providing useful heat or energy for industrial, commercial, or institutional use, or
  - reducing the volume of waste by removing combustible matter
- **Examples:**
  - Boilers
  - Stationary Internal Combustion Engines
  - Process Heaters/Coal Dryers
  - Combustion Turbines
  - Incinerators
  - Other Stationary Fuel Combustion Equipment (e.g. control devices)
- **Covers any fuel combustion device, unless specifically exempted**

# **Subpart C does not apply to:**



- Portable equipment
- Emergency generators and emergency equipment
- Agricultural irrigation pumps
- Flares, unless otherwise required by another subpart (For underground coal mines, flare emissions are reported under Subpart FF)
- Electricity Generating Units subject to subpart D
- Hazardous waste combustion (Table C-1 co-fired fuels only)
  - If source is monitored with CO<sub>2</sub> CEMS it is required to report
- Pilot lights

# What GHGs are Reported?




- **CO<sub>2</sub> from stationary combustion**
  - Four different methods (Tiers) for calculating CO<sub>2</sub> emissions
  - Different tiers used based on unit size, fuel type, other factors
  - Separately estimate CO<sub>2</sub> from sorbent used for acid gas control (unless CO<sub>2</sub> is measured with CEMS)
- **CH<sub>4</sub> and N<sub>2</sub>O**
  - Emission factors

# More Information - Hotline



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U.S. ENVIRONMENTAL PROTECTION AGENCY

## Greenhouse Gas Reporting Program

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### Rule Help Center

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EPA has developed a number of tools and documents to assist in understanding and complying with the Greenhouse Gas Reporting Program. Please note that these resources are intended for informational and instructional purposes only. Facility owners or operators and suppliers are responsible for determining how they would be affected by the requirements of Part 98. The tools and documents are provided solely for informational purposes. Compliance with all Federal, State, and Local laws and regulations remains the sole responsibility of each facility owner or operator subject to those laws and regulations.

- General Questions**  
For general questions about the Greenhouse Gas Reporting Program, please refer to the [Frequently Asked Questions](#) page. Additional resources, including information sheets, checklists, and technical support documents for each subpart of the rule are available through the [Resources by Subpart](#) page.
- Help Center**  
EPA also operates a help center for general and administrative questions about the rule. You can submit your question

#### Rule Help Center

- [Frequently Asked Questions](#)
- [Applicability Tool](#)
- [General Fact Sheet \(PDF\)](#) (4 pp, 55K)
- [2011 Special Provisions Fact Sheet \(PDF\)](#) (5 pp, 52K)
- [2010 Special Provisions Fact Sheet \(PDF\)](#) (6 pp, 69K)

You will need Adobe Reader to view some of the files on this page. See [EPA's PDF page](#) to learn more.

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# Links for help and additional information



- **GHG Reporting Program Information**  
<http://www.epa.gov/ghgreporting/index.html>
- **Help Desk inquiries:**  
[ghgreporting@epa.gov](mailto:ghgreporting@epa.gov)
- **Other Subpart FF resources**  
<http://www.epa.gov/ghgreporting/reporters/subpart/ff.html>



# **Appendix:**

# **Frequently Asked Questions**



**I have submitted my Subpart FF GHG report and it says that the report is “pending certification” in e-GGRT. What does this mean?**



- This means that you have submitted the report, but it cannot be viewed in e-GGRT until someone from the actual facility has certified that the report is accurate. Once the report has been certified then the report will be viewable in e-GGRT.

## **For purposes of reporting under the GHGRP, our facility includes operations with more than one MSHA ID number. How should we report?**



- The rule defines "facility" as any physical property, plant, building, structure, source, or stationary equipment located on one or more contiguous or adjacent properties in actual physical contact or separated solely by a public roadway or other public right-of-way and under common ownership or common control, that emits or may emit any greenhouse gas.
- In some instances, a "facility" under the Greenhouse Gas Reporting Program will contain more than one operation as defined by MSHA. In this case, the MSHA ID numbers must be provided for all operations included in the Subpart FF facility.

**For the subpart FF reporting form, should each row contain the quarterly estimates for methane concentration, temperature, pressure, and moisture content, even if there are multiple rows per quarter?**



- If there are legitimate instances when multiple rows are needed for a single quarter, all the rows should contain the quarterly estimates for the parameters listed.

## **What is the GWP for methane that is used for this rule?**



- The GWP for methane that is used for this rule is 21 for Reporting Years 2011, 2012, and 2013. For Reporting Year 2014 and after it is 25, consistent with the Intergovernmental Panel on Climate Change's Fourth Assessment Report.

## **What is the definition of facility as it relates to mines and coal mine methane energy plants?**



- Part 98 applies to "the owners and operators" of a subpart FF facility, and both 98.4 and 98.320 are applicable sections in this case.
- Owners and operators are defined in 98.320(b) as including each ventilation well or shaft and each degasification system well or shaft. Therefore, both the company(s) that owns and operates the ventilation system and the company(s) that owns and operates the degasification system are "the owners and operators" of the subpart FF facility and are subject to Part 98.
- According to 98.4, the owners and operators of a facility shall have one designated representative who shall be responsible for submitting GHG emissions reports for the facility. The parties can choose among themselves who will collect and report the emissions data. Part 98 provides owners and operators the flexibility to determine among themselves an appropriate Designated Representative to certify and submit the annual report.

## **If all of our coal mine methane gets piped offsite to another facility, what do we need to report?**



- If the coal mine and the other facility are separate facilities under the “facility” definition in 40 CFR 98.6, and the coal mine meets the reporting threshold, then the mine must (1) calculate and report methane liberation according to equations FF-1 through FF-4, and (2) calculate and report methane and CO<sub>2</sub> emissions according to equations FF-7 and FF-8, respectively. If the gas is transported off-site for destruction, then the mine should use a destruction efficiency (DE) of 1.0 in equation FF-5.
- Note that if the mine owns and operates any stationary combustion devices at the mine, the mine would report emissions from these combustion devices under Subpart C. However, the mine would not report emissions from stationary combustion devices located at a separate off-site facility that combusts gas from the mine.

# **Where do I report CO<sub>2</sub> emissions from compressors and methane exhausters (a.k.a. blowers/vacuum pumps) operating at the mine? What about methane destroyed on-site in this equipment?**



- If a facility is subject to subpart FF, report CO<sub>2</sub> emissions from stationary sources, including exhausters and compressors, under subpart C, regardless of the CO<sub>2</sub> emissions level. CH<sub>4</sub> destroyed on-site is reported under FF.
- If a facility is not subject to subpart FF, but emissions meet the threshold of >25K for all stationary combustion units, you must report CO<sub>2</sub> emissions under subpart C. Remember that the subpart C threshold is an aggregate threshold, so it would apply to the total stationary combustion emissions of the facility.
- The portability of the equipment does not exempt emissions from use of this equipment.
- You may also need to report N<sub>2</sub>O emissions in Subpart C for the combustion units.
- CO<sub>2</sub> emissions from on-site combustion for destruction only (e.g., flaring or destruction-only ventilation air oxidation) must be reported under Subpart FF.

## **Are methane emissions from passive vents exempted from the reporting requirement?**



- 98.323(a) states that GHG emissions must be calculated "For each ventilation shaft, vent hole, or centralized point into which CH<sub>4</sub> from multiple shafts and/or vent holes are collected..." There is no exemption for passive ventilation or degasification, so these vents should be included.



**Are the temperature and pressure values required for measurement supposed to be the gas (sample) temperature and pressure, or the ambient temperature and pressure?**



- For degasification systems, the temperature and pressure are the temperature and pressure within the pipe from which gas volume is measured,
- For mine ventilation air, the temperature and pressure are the temperature and pressure within the mine ventilation shaft.



## **Can methanometers be used to determine methane concentration and are they considered to be “gaseous organic concentration analyzers?”**

- There is one condition under which a methanometer can be used for measuring methane. Under section § 98.324 Monitoring and QA/QC Requirements, paragraph (d)(2) of the rule states that, "As an alternative to the gas chromatography methods provided in paragraph (d)(1) of this section, you may use gaseous organic concentration analyzers and a correction factor to calculate the CH<sub>4</sub> concentration following the requirements in paragraphs (d)(2)(i) through (d)(2)(iii) of this section."
- There are two types of gaseous methane analyzers allowed under § 98.324, paragraph (d)(2): non-dispersive infrared analyzers, and flame ionization analyzers. These two analyzers are described in EPA Analytical Methods 25a and 25b. Otherwise, the facility may use one of the ASTM methods specified in § 98.324, paragraph (d)(1), to measure methane concentrations. No other type of methane meter is allowed under the Subpart FF of Part 98.

**In equation FF-1, is the value supposed to be standard cubic feet per minute, or actual cubic feet per minute?**



- In the equation FF-1 in subpart FF, the reporter may use either standard or actual volumetric units for V, as long as T and P in the equation are based on the same condition. Thus, if V is in actual cubic feet per minute, then T and P should be at the actual conditions at which V was measured.
- The reporter is required to indicate acfm or scfm in the reporting form.

# Are there any provisions for extended inaccessibility of remote sites (e.g., degasification or gob vent boreholes) due to inclement weather (e.g., deep snow) that may restrict site access for weeks or even months?



- The “missing data” provisions of Section 98.325 in subpart FF define how emissions can be estimated if data are not available.
- For each missing value of CH<sub>4</sub> concentration, flow rate, temperature, pressure, and moisture content for ventilation and degasification systems, the substitute data value shall be the arithmetic average of the quality-assured values of that parameter immediately preceding and immediately following the missing data incident.
- If, for a particular parameter, no quality-assured data are available prior to the missing data incident, the substitute data value shall be the first quality-assured value obtained after the missing data period.
- The worksheet tabs in the FF reporting form that are used to calculate *Ventilation Quarterly*, *Degas Quarterly*, *Degas Weekly*, and *Destruction/Off-site Weekly* have set aside space where a reporter can provide the length of time substitute data are used.
- 98.35 contains the requirements for missing data for any operations subject to subpart C.

**We were unable to obtain any or all quarterly volumetric and CH<sub>4</sub> concentrations from our MSHA district office. What should we do?**



- You are still required to report quarterly ventilation emissions even if you are unable to obtain quarterly data from MSHA. If you did not use a continuous emissions monitoring system or take quarterly grab sample, you must use the substitute data procedures outlined in Section 98.325 of subpart FF.