

United States Greenhouse Gas Reporting Program for Coal Mine Methane

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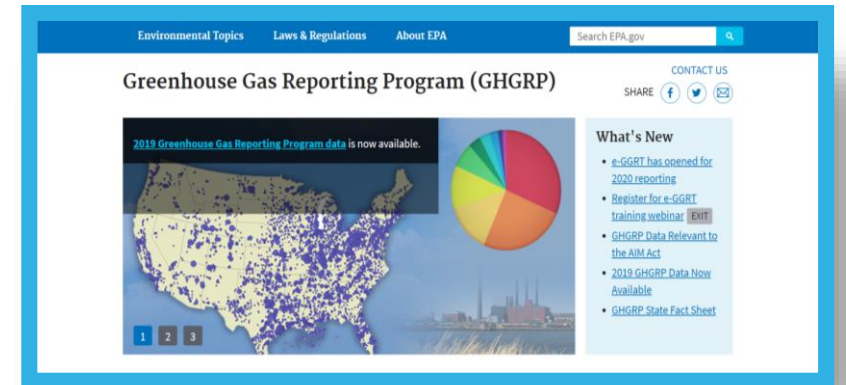
*2nd Meeting of the Task Force on Methane Emissions Reductions
29 September 2023*



Coal Mine Methane and U.S. Greenhouse Gas Reporting Program (GHGRP)

- In the United States, major industrial facilities are required to report their GHG emissions, as per 40 U.S. Code of Federal Regulations (CFR) Part 98. This applies to **active (working) underground coal mines**.
 - The threshold for reporting requirements: mines liberating at least 36.5 million ft³ (1.04 mill. m³) or more of methane per year
 - Emissions are self-reported annually based on quarterly (for ventilation systems) and weekly (for degasification systems) measurements for safety requirements
 - Data are public at facility (mine) level – the only publicly available dataset of such granularity in the world.

<https://www.epa.gov/ghgreporting>



US Coal Mines Annual Greenhouse Gas Emissions Reporting Requirements

- Major industrial facilities in the United States report their GHG emissions to U.S. Environmental Protection Agency (U.S. EPA) through the online reporting system
- Does not apply to:
 - Surface mines
 - Abandoned underground mines
 - Post-mining emissions
- Emission calculations are based on measured data:
 - Flow meters, Sampling, Continuous emissions monitoring systems (CEMS)
 - Measured parameters: CH₄%, flow rate, temperature, pressure, moisture content
- Reporters can cease reporting if they fall below the reporting threshold for 3-5 years or cease operation
- Annual emissions reports are self-certified by the facility
 - USEPA verifies reports using a range of tools including statistical checks
 - Does not entail 3rd party verification
- Reports are due in March; data are published on the USEPA website in October each year



Reporting Requirements for Underground Coal Mines

Data Element	Monitoring Points	Monitoring Frequency	Allowed Monitoring Methods			Notes
			MSHA Quarterly Inspection Reports	Manual sampling by mine staff	Continuous Emissions Monitoring	
MSHA ID						Mine Safety & Health Administration ID to check operating status and coal production
Description of degasification system						Manufacturer, capacity, # of wells, surface area, operating hours
CH ₄ liberated from ventilation systems	Each exhaust shaft	Quarterly	•	•	•	CH ₄ %, volumetric flow rate
CH ₄ liberated from degasification systems	Each well or centralized monitoring point	Weekly	N/A	•	•	CH ₄ %, volumetric flow rate
CH ₄ destroyed on-site/sent off-site	Each destruction device or point of transfer off-site	Weekly	N/A	N/A	•	CH ₄ %, volumetric flow rate
Net CH ₄ emissions	Mine-wide	Quarterly				Ventilation CH ₄ liberated + Degasification CH ₄ liberated - CH ₄ Destroyed/Sent Off-site
CO ₂ emissions (on-site destruction/no energy recovery)	Mine-wide	Quarterly				Flaring, Ventilation Air Methane (VAM) destruction
CO ₂ emissions (on-site destruction/energy recovery)	Mine-wide					Reported under Subpart C, combustion emissions

U.S. GHGRP Coverage of the Active U.S. Underground Coal Mines

- U.S. GHGRP covers the gassiest underground coal mines that were estimated (through national inventory) to emit 99% of emissions from all active U.S. underground coal mines, or 83% from all active coal mines, including surface, and 72% including post-mine emissions.
- Total underground production covered by GHGRP: 53%
- Total coal production (surface + underground) covered by GHGRP: 27%
- GWP of CH₄=28
- In summary, GHGRP focuses on the largest source and captures 99% of national emissions from this sector.

Source	Underground Mines & Emissions						
	2015	2016	2017	2018	2019	2020	2021
Mines Reporting to GHGRP	125	95	79	75	69	72	60
Active US underground mines	305	253	237	236	226	196	174
Total net CH ₄ emissions GHGRP (MMTCO ₂ e)*	49	44	43	40	39	35	32
Total net CH ₄ emissions (MMTCO ₂ e) estimated in national inventory	50	46	46	44	39	35	33
GHGRP Emissions Coverage	98%	96%	93%	92%	100%	99%	99%

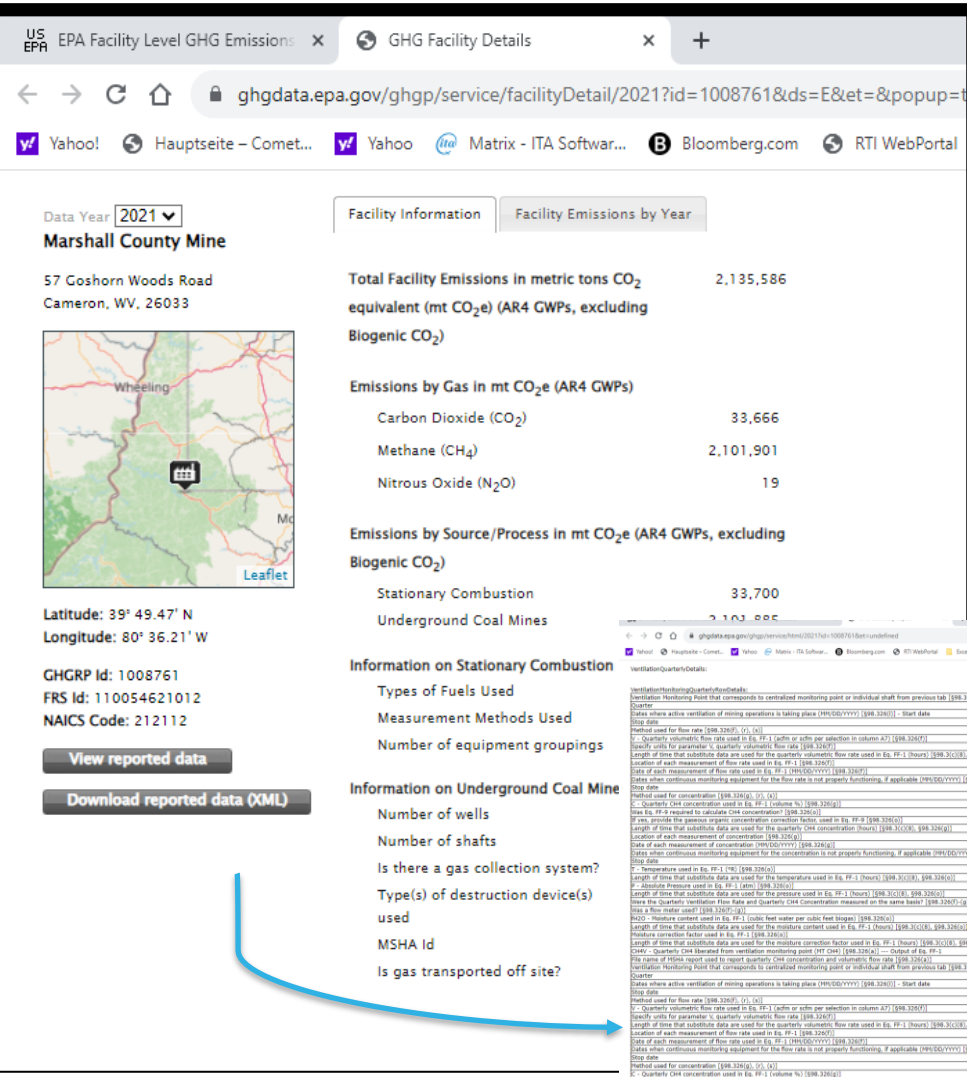
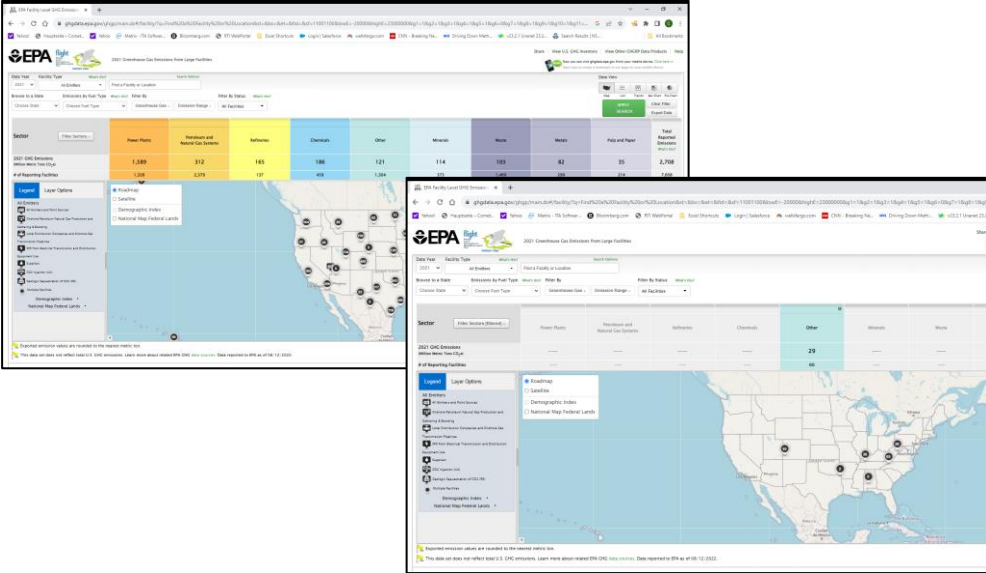
*GWP 28 used here for comparison purposes. GHGI began using GWP 28 in 2021 Inventory. GHGRP still uses GWP 25, but EPA proposed changing to CH₄ GWP to 28 in May 2023 rulemaking proposal.

Monitoring Methods Used by Reporters for Ventilation and Degasification Systems

Source of Emissions	Monitoring Method	Share of Facilities Using Each Method		
		2019	2020	2021
Ventilation systems	Quarterly measurement by mine staff (grab samples)	38%	40%	42%
	CEMS	0%	0%	0%
	MSHA samples during quarterly inspections	62%	60%	58%
Degasification systems*	CEMS	11%	14%	22%
	Weekly measurement by mine staff (grab samples)	89%	86%	78%

*~ 20 facilities per year

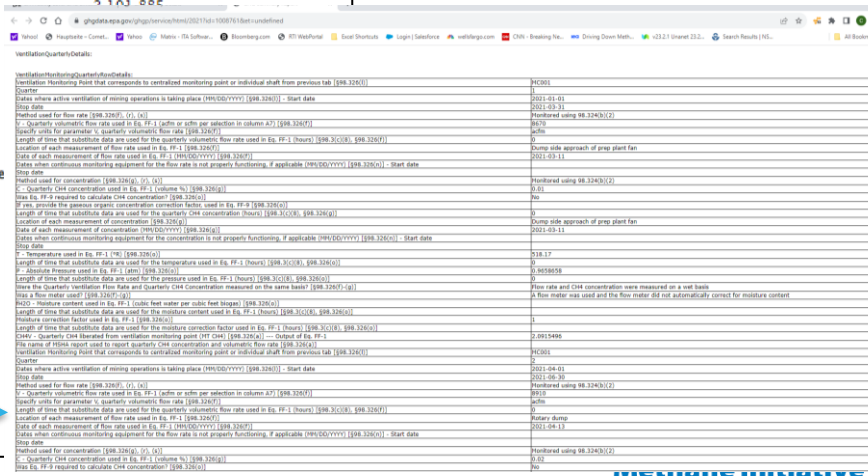
GHGRP Data Presentation



EPA FLIGHT

- *HTML & XML formats*
- *View mine-level reports*
- *Data granularity: at emission/destruction point source*
- *Limited ability to aggregate industry-wide data*

- Data publicly available using 2 online portals:
- Facility Level Information on Greenhouse gases Tool (FLIGHT)
 - HTML format
- Envirofacts
 - Metadata at emission source level



GHGRP Data Presentation

Envirofacts

Exports to CSV, Excel, JSON, XML formats

Data granularity: at emission/destruction point source for all years

Can aggregate industry-wide data



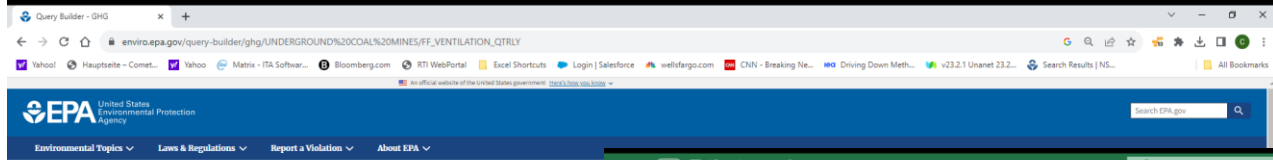
The 2022 Toxics Release Inventory preliminary dataset is now available in the Envirofacts TRI queries found below. Learn more on the TRI website.
The Envirofacts database is now RESTful service-enabled. See the services tab below for documentation and examples, or visit: Envirofacts Web Services

Get the Envirofacts!
Retrieve information from multiple sources of Envirofacts System Data for your area of interest.
Enter a location such as address, zip, city, country, waterbody, park name, etc.

Topic Searches: Air, Waste, Facility, Land, Toxics, Compliance, Water, Radiation, Other

Envirofacts System Data Searches: BSL, Bioenfield+Cleanups, Chemicals, ECHO/IDEA, ICIS-AIR, ICIS, UV Index, FIC, EZ Search, Organization Search, ICRA/IRIS, ICIS, PCS, Pollution Prevention, Localized Information, TRI Explorer, Form B Search, Form B, A Download, EZ Search, Customized Search, SRD, TSCA, UV Index

Other Sites of Interest: Geospatial, EnviroMapper, MyEnvironment, MyProperty



GHG Query Builder

Retrieve data in 4 steps:

- Choose a Subject Area
- Choose a Table

Underground Coal Mines: ff_ventilation_qtrly

Facility Name

Name of reporting facility

Gaseous Organic Concentration Correction Factor

GHGRP Facility Identification Number

A facility's Greenhouse Gas Reporting Program identification number (GHGRP ID)

Pressure Vent. Lib	Active Ventilation Start Date	Active Ventilation Stop Date	Facility Name	ghg_organic_conc_corrctn_fact	Facility ID	Method Used for Calc	Method for Rate	Monit. eq. (vent. lib)	ventil. lib used	operat. rate (vent. lib)	ghg_vol (lb, vent. lib)	ghg_rate (lb, vent. lib)	ghg_vol (lb, vent. lib)	ghg_rate (lb, vent. lib)	response (lb, vent. lib)	start (date, vent. lib)	end (date, vent. lib)	stop (date, vent. lib)	term (date, vent. lib)	times (date, vent. lib)	times (date, vent. lib)	times (date, vent. lib)	times (date, vent. lib)	times (date, vent. lib)	times (date, vent. lib)
M.00764	2018-01-01	2018-01-31	Pochozapas Coal Company, LLC - Alluvia Mine		106771	Monitored using 38	Monitored using 38	324842	0	0	0	0	0	0	2018	2018-01-01	2018-01-31	2018-01-31	2018-01-31	0	0	0	0	0	0

Resources

Voluntary Programs

- Global Methane Initiative
 - <https://www.globalmethane.org>
- U.S. EPA Coalbed Methane Outreach Program
 - <https://www.epa.gov/cmop>

GHGRP

- Greenhouse Gas Reporting Program:
 - <http://www.epa.gov/ghgreporting>
- Subpart FF (includes training materials):
 - <https://www.epa.gov/ghgreporting/subpart-ff-underground-coal-mines>
- Data Source: Facility Level Information on Greenhouse Gases Tool (Flight):
 - <https://ghgdata.epa.gov/ghgp/main.do#>
- Data Source: Envirofacts (Greenhouse Gas Customized Search):
 - <https://www.epa.gov/enviro/greenhouse-gas-customized-search>
- 40 CFR Part 98—MANDATORY GREENHOUSE GAS REPORTING:
 - https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr98_main_02.tpl

Thank You

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