United States Environmental Protection Agency

Summary of Public Comments and Responses for 2024 Revisions and Confidentiality Determinations for Data Elements under the Greenhouse Gas Reporting Rule

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February 2024

Summary of Public Comments and Responses for

U. S. Environmental Protection Agency
Office of Air and Radiation
Office of Air Policy and Program Support
Washington D.C. 20460

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U.S. Environmental Protection Agency

Climate Change Division, Office of Atmospheric Programs (MC–6207A)

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List of Acronyms and Abbreviations

AAPC	American Automotive Policy Council
AAPG	American Association of Petroleum Geologists
ABC	American Biogas Council
ACE	Automated Commercial Environment
AFPM	American Fuels and Petrochemical Manufacturers
AGA	American Gas Association
AGR	Acid Gas Removal
AGRU	Acid Gas Removal Units
AIPRO	Arkansas Independent Producers and Royalty Owners
AISI	American Iron and Steel Institute
AMLD	advanced mobile detection platform
ANS	Alaska North Slope
ANSI	American National Standards Institute
AOGA	Alaska Oil & Gas Association
APA	Administrative Procedure Act
APGA	American Public Gas Association
API	American Petroleum Institute
AQCC	Air Quality Control Commission
ASR	auto shredder residue
ASTM	ASTM International
AVIRIS	Airborne Visible/Infrared Imaging Spectrometer
AXPC	American Exploration & Production Council
BAMM	best available monitoring methods
BEF	by-product emission factor
BIA	Brick Industry Association
BIEC	Border Interagency Executive Council
BLM	Bureau of Land Management
BMP	best management practices
BOE	barrel of oil equivalent
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
BSER	best system of emission reduction
CAA	Clean Air Act
CARB	California Air Resources Board

CATF	Clean Air Task Force
CBI	confidential business information
CBP	U.S. Customs & Border Protection
CCS	carbon capture and storage
CCUS	carbon capture, utilization, and storage
CECS	combustion emissions control systems
CEMS	continuous emissions monitoring system
CE	control efficiency
CFM	cubic feet per minute
CFR	Code of Federal Regulations
CKD	cement kiln dust
CSA	CSA Group
CURC	Carbon Utilization Research Council
DAC	direct air capture
DCN	docket control number
DCU	delayed coking unit
DOC	degradable organic carbon
DOE	U.S. Department of Energy
DOI	U.S. Department of Interior
DOJ	U.S. Department of Justice
DOT	U.S. Department of Transportation
DRE	destruction and removal efficiency
DSI	Downstream Natural Gas Initiative
EAC	Energy Advance Center
EAF	electric arc furnace
EDAC	Environmental Data Accuracy Coalition
EDC	ethylene dichloride
EDF	Environmental Defense Fund
EEI	Edison Electric Institute
EF	emission factor
e-GGRT	electronic Greenhouse Gas Reporting Tool
EGU	electric generating unit
EIA	U.S. Energy Information Administration
EIP	Environmental Integrity Project
EMA	Truck & Engine Manufacturers Association
EOG	EOG Resources, Inc.

EOR	enhanced oil recovery
EPA	U.S. Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
ERCOT	Electric Reliability Council of Texas
EREF	Environmental Research and Education Foundations
ESG	environmental, social, and government
FDL	field detection limit
F-GHGs	fluorinated greenhouse gases
FID	flame ionization detector
FLIGHT	Facility Level Information on GreenHouse gases Tool
FLIR	forward looking infrared
FOD	first order-decay
FTIR	Fourier-transform infrared
GCCS	gas collection and control system
GCS	gas capture system
GHG	greenhouse gas
GHGI	Inventory of U.S. Greenhouse Gas Emissions and Sinks
GHGRP	Greenhouse Gas Reporting Program
GHGRR	Greenhouse Gas Reporting Rule
GIE	gas-insulated equipment
GIS	geographic information systems
GPA	GPA Midstream Association
GRI	Gas Research Institute
GWP	global warming potential
HTS	Harmonized Tariff System
ICR	information collection request
IEA	International Energy Agency
IFRS	International Financial Reporting Standards
IME	integrated mass enhancement
INGAA	Interstate Natural Gas Association of America
IPAA	Independent Petroleum Association of America
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
IRA	Inflation Reduction Act of 2022
IRS	Internal Revenue Service
ISO	International Standards Organization

ISSB	International Sustainability Standards Board
ITC	International Trade Commission
IURC	Indiana Utility Regulatory Commission
IVT	inputs verification tool
KOGA	Kentucky Oil and Gas Association
LADWP	Los Angeles Department of Water and Power
LCA	life cycle analysis or life cycle assessment
LCRA	Lower Colorado River Authority
LDAR	leak detection and repair
LDC	local distribution company
LFG	landfill gas
LMOP	Landfill Methane Outreach Program
LNG	liquified natural gas
LVAE	low voltage anode effects
MDE	Maryland Department of the Environment
MEMP	metered energy monitoring plan
MERP	Methane Emissions Reduction Program
MGL	mobile ground lab
MMSCF	million standard cubic feet
MMT	million metric tons
MRR	mandatory reporting rule
MRV	Management, Reporting, and Verification Plan
MSC	Marcellus Shale Coalition
MSW	municipal solid waste
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NAIMA	North American Insulation Manufacturers Association
NASA	National Aeronautics and Space Administration
NBRC	National Brick Research Center
NDPC	North Dakota Petroleum Council
NEDA/CAP	National Environmental Development Associations Clean Air Project
NEMA	National Electrical Manufacturers Association
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFTC	National Foreign Trade Council
NGL	natural gas liquid
NGO	nongovernmental organization

NLA	National Lime Association
NMGC	New Mexico Gas Company
NOAA	National Oceanic and Atmospheric Administration
NOIA	National Ocean Industries Association
NOPR/NPRM	notice of proposed rulemaking
NREL	National Renewable Energy Laboratory
NRU	nitrogen removal unit
NSPS	new source performance standard
NWRA	National Waste & Recycling Association
OECA	EPA Office of Enforcement and Compliance Assurance
OEM	original equipment manufacturer
OGCI	Oil and Gas Climate Initiative
OGI	optical gas imaging
OGMP	Oil and Gas Methane Partnership
OLCV	Oxy Low Carbon Ventures
OMP	operations management plan
OOAG	Ohio Oil and Gas Association
OOC	Offshore Operators Committee
PAW	Petroleum Association of Wyoming
PBPA	Permian Basin Petroleum Association
PCA	Portland Cement Association
PFC	perfluorocarbon
PHMSA	Pipeline Hazardous Materials and Safety Administration
PID	photo ionization detector
POU	point of use
POX	partial oxidation
PPA	power purchase agreement
PRA	Paperwork Reduction Act
PRCI	Pipeline Research Council International
PSE	Puget Sound Energy, Inc.
REC	renewable energy credit
RFA	Regulatory Flexibility Act
RFC	request for comment
RPC	remote plasma cleaning
RTI	RTI International
RTO	regional transmission organization

SCF	standard cubic feet
SEC	Security Exchange Commission
SEM	surface emission monitoring
SIA	Semiconductor Industry Association
SLCP	short-lived climate pollutant
SMR	steam methane reforming
SSE	sum of squared errors
SSM	startup, shutdown, or malfunction
SWANA	Solid Waste Association of North America
SWDS	solid waste disposal service
SWICS	Solid Waste Industry for Climate Solutions
TCD	thermal conductivity detector
TDF	tire derived fuel
TFI	The Fertilizer Institute
TMAA	Transformer Manufacturing Association of America
TPA	Texas Pipeline Association
TRI	Toxics Release Inventory
TSD	technical support document
UAV	unmanned aerial vehicle
UIC	Underground Injection Control
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VCM	vinyl chloride monomer
VOC	volatile organic compound
VRU	vapor recovery unit
WGS	water gas shift

1.0 Introduction

The EPA previously proposed amendments to specific provisions of part 98 on June 21, 2022 where we identified opportunities to improve the quality of the data collected under the rule (87 FR 36920, hereafter referred to as the "2022 Data Quality Improvements Proposal"). The proposed rule included revisions that would provide for the collection of additional data that may be necessary to better understand emissions from specific sectors or inform future policy decisions; update emission factors; and refine emissions estimation methodologies. The proposed rule also included revisions that provided for the collection of additional data that would be useful to improve verification of collected data and complement or inform other EPA programs. These proposed revisions included the incorporation of a new source category to add calculation and reporting requirements for quantifying geologic sequestration of CO_2 in association with enhanced oil recovery (EOR) operations. In several cases, the 2022 Data Quality Improvements Proposal included revisions that would resolve gaps in the current coverage of the GHGRP that leave out potentially significant sources of GHG emissions or end uses. The EPA also proposed revisions that clarified or updated provisions that may be unclear, and that would streamline calculation, monitoring, or reporting in specific provisions in part 98 to provide flexibility or increase the efficiency of data collection. The EPA included a request for comment on expanding the GHGRP to include several new source categories (see section IV of the 2022 Data Quality Improvements Proposal at 87 FR 37016) and requested comment on potential future amendments to add new calculation, monitoring, and reporting requirements for these categories. The EPA also proposed confidentiality determinations for new or substantially revised data reporting elements that would be amended under the proposed rule, as well as for certain existing data elements for which the EPA proposed a new determination. The EPA received comments on the 2022 Data Quality Improvements Proposal through October 6, 2022.

The EPA subsequently proposed additional amendments to part 98 where the agency had received or identified new information to further improve the data collected under the GHGRP (88 FR 32852, May 22, 2023, hereafter referred to as the "2023 Supplemental Proposal"). The 2023 Supplemental Proposal included amendments that were informed by a review of comments and information provided by stakeholders on the 2022 Data Quality Improvements Proposal, as well as newly proposed amendments that the EPA had identified from program implementation, *e.g.*, where additional data would improve verification of data reported to the GHGRP or would further aid our understanding of changing industry emission trends. The 2023 Supplemental Proposal included a comprehensive update to the global warming potentials (GWPs) in Table A–1 to subpart A of part 98; proposed amendments to establish new subparts with specific reporting provisions under part 98 for five new source categories; and several proposed revisions where the EPA had identified new data supporting improvements to the calculation, monitoring, and recordkeeping requirements. The 2023 Supplemental Proposal also clarified or corrected specific proposed provisions of the 2022 Data Quality Improvements Proposal. The amendments included in the 2023 Supplemental Proposal were proposed as part of the EPA's continued efforts to address potential data gaps and improve the quality of the data collected in the GHGRP. The EPA also proposed confidentiality determinations for new or substantially revised data reporting elements that would be revised under the supplemental proposed amendments. The EPA received comments on the 2023 Supplemental Proposal through July 21, 2023.

The revisions included in the 2022 Data Quality Improvements Proposal and the 2023 Supplemental Proposal were based on the EPA's assessment of advances in scientific understanding of GHG emissions sources, updated guidance on GHG estimation methods, and a review of the data collected and emissions trends established following more than 10 years of implementation of the program. The revisions reflect the EPA's efforts to update and improve the GHGRP by better capturing the changing landscape of greenhouse gas emissions, providing for more complete coverage of U.S. GHG emission sources, and providing a more comprehensive approach to understanding GHG emissions.

Some major comments and EPA's responses appear in the preamble to the final rule. This document contains summaries of public comments that the EPA received on the proposed standards and EPA's responses. Copies of all comments submitted are available electronically through https://www.regulations.gov by searching Docket ID No. EPA-HQ-OAR-2019-0424.[1]

[1] See also: https://www.epa.gov/dockets

2.0 List of Commenters

The EPA received 99 comment letters after October 6, 2022, on the 2022 Data Quality Improvements Proposal, and 47 comment letters after July 21, 2023 on the 2023 Supplemental Proposal. All comment letters received on the proposed rulemaking are contained in Docket Id. No. EPA-HQ-OAR-2019-0424. The commenter, affiliation, and docket control number (DCN) are listed in Table 2-1.

Table 2-1. List of Commenters

DCN	Name	Affiliation
EPA-HQ-OAR-2019-0424-0153-A1	Marna McDermott	Exelon Corporation
EPA-HQ-OAR-2019-0424-0154-A1	Scott Yager	Interstate Natural Gas Association of America (INGAA)
EPA-HQ-OAR-2019-0424-0155-A1	Matthew Hite	GPA Midstream Association (GPA)
EPA-HQ-OAR-2019-0424-0156-A1	Erin Kurilla	American Public Gas Association (APGA)
EPA-HQ-OAR-2019-0424-0157-A1	Keith Tracy	Elysian
EPA-HQ-OAR-2019-0424-0158-A1	Pamela A. Lacey	American Gas Association (AGA)
EPA-HQ-OAR-2019-0424-0159-A1	Amy D. Kapuga	Consumers Energy Company
EPA-HQ-OAR-2019-0424-0160-A1	Jay Bower	Puget Sound Energy, Inc. (PSE)
EPA-HQ-OAR-2019-0424-0162-A1	Wendy Kirchoff	American Exploration and Production Council (AXPC)
EPA-HQ-OAR-2019-0424-0163-A1	Angie Burckhalter	The Petroleum Alliance of Oklahoma
EPA-HQ-OAR-2019-0424-0164-A1	Emily Sanford Fisher	Edison Electric Institute (EEI)
EPA-HQ-OAR-2019-0424-0165-A1	Jenifer Ries	Atmos Energy Corporation
EPA-HQ-OAR-2019-0424-0166-A1	John Fusch	
EPA-HQ-OAR-2019-0424-0167	Anonymous	
EPA-HQ-OAR-2019-0424-0168	Claire Chase	
EPA-HQ-OAR-2019-0424-0169	Anonymous	
EPA-HQ-OAR-2019-0424-0171-A1	David Miracle	Nucor Corporation
EPA-HQ-OAR-2019-0424-0172-A1	Hannah Gotsch	Carbide Industries LLC

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DCN	Name	Affiliation
EPA-HQ-OAR-2019-0424-0174	Kaine Cogan	
EPA-HQ-OAR-2019-0424-0175-A1	Audrey Lumpkin	
EPA-HQ-OAR-2019-0424-0176-A1	Ryan Streams	Kairos Aerospace (Kairos)
EPA-HQ-OAR-2019-0424-0177	Anonymous	
EPA-HQ-OAR-2019-0424-0178		Sensors, Inc.
EPA-HQ-OAR-2019-0424-0179-A1	Ryan Minegishi	Konica Minolta Sensing Americas, Inc.
EPA-HQ-OAR-2019-0424-0180-A1	Joseph Kasper	The Brick Industry Association (BIA)
EPA-HQ-OAR-2019-0424-0181-A1	Charles E. Venditti	Countrymark Energy Resources, LLC
EPA-HQ-OAR-2019-0424-0182-A1	Ryan Watts	Kentucky Oil and Gas Association (KOGA)
EPA-HQ-OAR-2019-0424-0183-A1	Rodney Baker	Arkansas Independent Producers and Royalty Owners (AIPRO)
EPA-HQ-OAR-2019-0424-0184-A1	Karen Knutson	Chevron
EPA-HQ-OAR-2019-0424-0185-A1	Kris Knudson	Duke Energy
EPA-HQ-OAR-2019-0424-0186-A1	Brian S. Taylor	Project Canary, PBC
EPA-HQ-OAR-2019-0424-0187-A1	Johnathan Stewart	National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
EPA-HQ-OAR-2019-0424-0188-A1	Ben Shepperd	Permian Basin Petroleum Association (PBPA)
EPA-HQ-OAR-2019-0424-0189-A1		Institute for Energy and Resource Management (IeRM)
EPA-HQ-OAR-2019-0424-0190-A1	Caroline Alden	LongPath Technologies
EPA-HQ-OAR-2019-0424-0191-A1		Semiconductor Industry Association (SIA)
EPA-HQ-OAR-2019-0424-0192-A1	Matthew Hite	GPA Midstream Association
EPA-HQ-OAR-2019-0424-0193-A1	Thure Cannon	Texas Pipeline Association (TPA)
EPA-HQ-OAR-2019-0424-0194		HLP Engineering, Inc.

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DCN	Name	Affiliation
EPA-HQ-OAR-2019-0424-0195-A1	William Hittie	INNIO Waukesha Gas Engines, Inc.
EPA-HQ-OAR-2019-0424-0196-A1	Campbell Pryde	XBRL US, Inc.
EPA-HQ-OAR-2019-0424-0197-A1	Johnathan DeAth	National Lime Association (NLA)
EPA-HQ-OAR-2019-0424-0198-A1; EPA-HQ-OAR-2019-0424-0198-A2		GTI Energy
EPA-HQ-OAR-2019-0424-0199-A1	David Callahan	Marcellus Shale Coalition (MSC)
EPA-HQ-OAR-2019-0424-0200-A1	Howard R. Dieter	Jonah Energy LLC
EPA-HQ-OAR-2019-0424-0201-A1	Greg Southworth and Erik Milito	Offshore Operators Committee (OOC) and National Ocean Industries Association (NOIA)
EPA-HQ-OAR-2019-0424-0202-A1	Douglas Jordan	Western Midstream Partners, LP
EPA-HQ-OAR-2019-0424-0203-A1	Curtis J. Winner	New Mexico Gas Company (NMGC)
EPA-HQ-OAR-2019-0424-0204-A1	Michael E. Van Brunt, P.E.	Covanta
EPA-HQ-OAR-2019-0424-0205-A1	George D. Baker	Energy Advance Center (EAC)
EPA-HQ-OAR-2019-0424-0206-A1	Jessie Stolark	Carbon Capture Coalition (the Coalition)
EPA-HQ-OAR-2019-0424-0207-A1; EPA-HQ-OAR-2019-0424-0207-A2	Michael S. Land	Terra Energy Partners (Terra)
EPA-HQ-OAR-2019-0424-0208-A1	Markus Videnieks	Circular Economy Coalition (CEC)
EPA-HQ-OAR-2019-0424-0209-A1		Exelon
EPA-HQ-OAR-2019-0424-0210-A1	Reagan Giesenschlag	The Fertilizer Institute (TFI)
EPA-HQ-OAR-2019-0424-0211-A1	Sean O'Neill	Portland Cement Association (PCA)
EPA-HQ-OAR-2019-0424-0212-A1	Timothy A. French	Truck & Engine Manufacturers Association (EMA)

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DCN	Name	Affiliation
EPA-HQ-OAR-2019-0424-0213-A1	Leslie Ritts	National Environmental Development Associations Clean Air Project (NEDA/CAP)
EPA-HQ-OAR-2019-0424-0214-A1	Tamara S. Maddox	Alaska Oil & Gas Association (AOGA)
EPA-HQ-OAR-2019-0424-0215-A1	Angus E. Crane	North American Insulation Manufacturers Association (NAIMA)
EPA-HQ-OAR-2019-0424-0216-A1	Brian K. Woodard	Chesapeake Energy Corporation
EPA-HQ-OAR-2019-0424-0217-A1	William Swetra	Oxy Low Carbon Ventures (OLCV)
EPA-HQ-OAR-2019-0424-0218-A1	Curt Wells	The Aluminum Association
EPA-HQ-OAR-2019-0424-0219-A1; EPA-HQ-OAR-2019-0424-0219-A2	Alex Bond	Edison Electric Institute (EEI)
EPA-HQ-OAR-2019-0424-0220-A1	Angie Burckhalter	The Petroleum Alliance of Oklahoma
EPA-HQ-OAR-2019-0424-0221-A1	Amy D. Kapuga	Consumers Energy Company
EPA-HQ-OAR-2019-0424-0222-A1	Joseph Leimkuhler	Beacon Offshore Energy
EPA-HQ-OAR-2019-0424-0223-A1	Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II	American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
EPA-HQ-OAR-2019-0424-0224-A1; EPA-HQ-OAR-2019-0424-0224-A2	Scott Yager	Interstate Natural Gas Association of America (INGAA)
EPA-HQ-OAR-2019-0424-0225-A1	Ron Ness	North Dakota Petroleum Council (NDPC)
EPA-HQ-OAR-2019-0424-0226-A1	Leah Kelly	Environmental Integrity Project (EIP)
EPA-HQ-OAR-2019-0424-0227-A1		Environmental Data Accuracy Coalition (EDAC)
EPA-HQ-OAR-2019-0424-0228-A1	Prof. Nickolas J. Themelis	Earth Engineering Center, Columbia University
EPA-HQ-OAR-2019-0424-0229-A1		Solar Turbines Incorporated

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DCN	Name	Affiliation
EPA-HQ-OAR-2019-0424-0230-A1	Dan Naatz	Independent Petroleum Association of America (IPAA)
EPA-HQ-OAR-2019-0424-0231-A1	David Vollero	York County Solid Waste and Refuse Authority, Pennsylvania
EPA-HQ-OAR-2019-0424-0232-A1	Colin McKee	Petroleum Association of Wyoming (PAW)
EPA-HQ-OAR-2019-0424-0233-A1	Susan Glickman	Stop Landfill Pollution
EPA-HQ-OAR-2019-0424-0234-A1	John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele	RMI
EPA-HQ-OAR-2019-0424-0235-A1	Kim White	EOG Resources, Inc.
EPA-HQ-OAR-2019-0424-0236-A1	Pamela A. Lacey, Tim Parr, and Erin Kurilla	American Gas Association (AGA) and American Public Gas Association (APGA)
EPA-HQ-OAR-2019-0424-0237-A1	Darrell K. Smith and David Biderman	National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
EPA-HQ-OAR-2019-0424-0238-A1	Caroline Hon and Ross W. Turini	National Grid USA
EPA-HQ-OAR-2019-0424-0239-A1	Kathleen Sgamma	Western Energy Alliance
EPA-HQ-OAR-2019-0424-0240-A1	Dar Baas	Kent County Department of Public Works, Michigan
EPA-HQ-OAR-2019-0424-0241-A1; EPA-HQ-OAR-2019-0424-0241-A2; EPA-HQ-OAR-2019-0424-0241-A3	Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka	Environmental Defense Fund (EDF)
EPA-HQ-OAR-2019-0424-0242-A1	Michael G. Dunn	Williams Companies, Inc. (Williams)
EPA-HQ-OAR-2019-0424-0243-A1	Domenic DeCaria	Vinyl Institute (VI)
EPA-HQ-OAR-2019-0424-0244-A1		American Chemistry Council et al.

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DCN	Name	Affiliation
EPA-HQ-OAR-2019-0424-0245-A1	Katherine Rubin	Los Angeles Department of Water and Power (LADWP)
EPA-HQ-OAR-2019-0424-0246-A1	Stephanie Kromer	Ohio Oil and Gas Association (OOGA)
EPA-HQ-OAR-2019-0424-0247-A1	Michael Arch	Range Resources Corporation
EPA-HQ-OAR-2019-0424-0248-A1	Alan Masinter	Clean Air Task Force (CATF)
EPA-HQ-OAR-2019-0424-0249-A1	Brian Jones	Downstream Natural Gas Initiative
EPA-HQ-OAR-2019-0424-0250-A1	Debra J. Jezouit	Class of '85 Regulatory Group
EPA-HQ-OAR-2019-0424-0251-A2	Fiji George	Cheniere Energy, Inc.
EPA-HQ-OAR-2019-0424-0252-A2	Hannah Turner	Carbon Utilization Research Council (CURC)
EPA-HQ-OAR-2019-0424-0253-A2	Asa Carre-Burritt, PhD	Bridger Photonics, Inc.
EPA-HQ-OAR-2019-0424-0285	Monica Prabhu	
EPA-HQ-OAR-2019-0424-0286-A1	Morton Barlaz	
EPA-HQ-OAR-2019-0424-0287-A1	Joseph Casper	Brick Industry Association (BIA)
EPA-HQ-OAR-2019-0424-0288-A1	Jose Godoy	American Petroleum Institute (API)
EPA-HQ-OAR-2019-0424-0289-A1	Jeff Hansbro	DuPont Performance Building Solutions
EPA-HQ-OAR-2019-0424-0290-A1	Charles Franklin	American Chemistry Council (ACC) et al.
EPA-HQ-OAR-2019-0424-0291-A1	Eric Choi	GHGSat Inc.
EPA-HQ-OAR-2019-0424-0292-A1	Carolyn Alden	LongPath Technologies, Inc.
EPA-HQ-OAR-2019-0424-0293-A1	Thure Cannon	Texas Pipeline Association (TPA)
EPA-HQ-OAR-2019-0424-0294-A1	Joseph Donovan	Transformer Manufacturing Association of America (TMAA)
EPA-HQ-OAR-2019-0424-0295-A1		Theresa Pugh Consulting, LLC

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DCN	Name	Affiliation
EPA-HQ-OAR-2019-0424-0296-A1		National Foreign Trade Council (NFTC)
EPA-HQ-OAR-2019-0424-0297-A1	Kimberly S.L. Bauman	Mississippi Lime Company
EPA-HQ-OAR-2019-0424-0298-A1	S. Dear Schramm-Satayathum	Citizens Energy Group
EPA-HQ-OAR-2019-0424-0299-A1	Intel Corporation	
EPA-HQ-OAR-2019-0424-0300-A1		American Automotive Policy Council (AAPC)
EPA-HQ-OAR-2019-0424-0301-A1	Andrew Smith	The Aluminum Association
EPA-HQ-OAR-2019-0424-0302-A1	Jessie Stolark	Carbon Capture Coalition
EPA-HQ-OAR-2019-0424-0303-A1	Patti Hershey	Lower Colorado River Authority Transmission Services Corporation (LCRA)
EPA-HQ-OAR-2019-0424-0304-A1	Joseph D'Ath	National Lime Association (NLA)
EPA-HQ-OAR-2019-0424-0305-A1		Environmental Integrity Project (EIP)
EPA-HQ-OAR-2019-0424-0306-A1	Hannah Nesser	
EPA-HQ-OAR-2019-0424-0307-A1	James D.W. Roush	CMS Energy Corporation
EPA-HQ-OAR-2019-0424-0308-A1	Michael E. Van Brunt	Covanta Energy, LLC
EPA-HQ-OAR-2019-0424-0309	Susan Glickman	
EPA-HQ-OAR-2019-0424-0310-A1	Elizabeth Ravestijn	Air Products and Chemicals, Inc.
EPA-HQ-OAR-2019-0424-0311-A1		Semiconductor Industry Association (SIA)
EPA-HQ-OAR-2019-0424-0312-A1		Environmental Defense Fund (EDF)
EPA-HQ-OAR-2019-0424-0313-A1	Patrick Serfass	American Biogas Council (ABC)
EPA-HQ-OAR-2019-0424-0314-A1		American Petroleum Institute (API) et al.
EPA-HQ-OAR-2019-0424-0315-A1	Emily Sanford Fisher	Edison Electric Institute (EEI)

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DCN	Name	Affiliation
EPA-HQ-OAR-2019-0424-0316-A1	Paul Balserak	American Iron and Steel Institute (AISI)
EPA-HQ-OAR-2019-0424-0317-A1	John I. Taylor	LG Electronics USA, Inc.
EPA-HQ-OAR-2019-0424-0318-A1		American Gas Association (AGA) and American Public Gas Association (APGA)
EPA-HQ-OAR-2019-0424-0319-A1		National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
EPA-HQ-OAR-2019-0424-0320-A1	Angie Burkhalter	The Petroleum Alliance of Oklahoma
EPA-HQ-OAR-2019-0424-0321-A1	Scott Yager	Interstate Natural Gas Association of America (INGAA)
EPA-HQ-OAR-2019-0424-0323-A1	Leslie Bellas	American Fuels and Petrochemical Manufacturers (AFPM)
EPA-HQ-OAR-2019-0424-0324-A1		Carbon Mapper
EPA-HQ-OAR-2019-0424-0325-A1		American Chemistry Council (ACC) et al.
EPA-HQ-OAR-2019-0424-0326-A1	Dan Naatz	Independent Petroleum Association of America (IPAA)
EPA-HQ-OAR-2019-0424-0327-A1	Matt Hite	GPA Midstream Association
EPA-HQ-OAR-2019-0424-0328-A1	Stephanie Engwall	Atmos Energy Corporation
EPA-HQ-OAR-2019-0424-0329-A1		Class of ’85 Regulatory Response Group
EPA-HQ-OAR-2019-0424-0330-A1; EPA-HQ-OAR-2019-0424-0330-A2		Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
EPA-HQ-OAR-2019-0424-0331-A1	L. Ritts	National Environmental Development Association’s Clean Air Project (NEDA/CAP)
EPA-HQ-OAR-2019-0424-0332-A1; EPA-HQ-OAR-2019-0424-0332-A2	Joseph Casper	Brick Industry Association (BIA)

3.0 Comments on subpart A (General Provisions)

3.1 General comments on revisions to Subpart A

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 34

Comment Excerpt: The Industry Trades support attempts to clarify reporting requirements under subpart A, including clarifications regarding reporting requirements for assets transferred in a reporting year, amendments to the definition of vapor recovery systems, clarifications regarding off-ramping, and incorporation by reference of CSA/ANSI ISO 27916:2019, Carbon Dioxide Capture, Transportation and Geologic storage Carbon Dioxide Storage Using Enhanced Oil Recovery (CO_2-EOR).

Response: The EPA acknowledges the commenter's support for the proposed revisions. As discussed in section I.C of the preamble, the EPA is not taking final action on the revisions to subpart W, including harmonizing revisions to subparts A (General Provisions) and C (General Stationary Fuel Combustion Sources) related to subpart W, that were proposed in the 2022 Data Quality Improvements Proposal in this final rule. This includes proposed revisions to subpart A regarding reporting requirements for assets transferred in a report year and the definition of vapor recovery systems.

3.2 Revisions to applicability and offramping requirements (40 CFR 98.2)

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA proposes to clarify the provisions that allow cessation of reporting or "off-ramping" due to meeting either the 15,000 metric tons of carbon dioxide equivalent ($mtCO_2e$) level or the 25,000 $mtCO_2e$ level for the subsequent number of years; however, during off-ramping, reporters are required to continue to report emissions for 3 years and 5 years respectively, as specified in 40 CFR 98.2(1) based on calculated in accordance with 40 CFR 98.3(c)(4)(i). This additional reporting is resource intensive, and we question the need for this additional reporting time frame after off-ramping. EPA notes in the Proposed Rule that reporters are required to restart reporting their emissions subsequent to off-ramping if their emissions meet the reporting threshold. We request EPA remove the subsequent reporting after off-ramping. At a minimum, EPA should shorten the time frames and provide detailed justification for continuing to require reporting after off-ramping.

Response: EPA did not propose and is not taking final action in this rule to change the framework of the numeric years of the offramp provisions to cease reporting. As previously explained when adopting the existing requirements, the framework for GHGRP was adopted to help aid in comparing trends over time, with the off-ramping adopted as a method for facilities to move out of the reporting program due to reduced emissions over an extended period of time. As noted in the 2009 preamble, EPA selected a 5-year offramp period to avoid situations where facilities or suppliers are constantly moving in and out of the reporting program due to small variations from one year to the next. The shorter 3-year period was adopted in acknowledgement that reporters below 15,000 $mtCO_2e$ would unlikely experience such variations from year to year (74 FR 56276-56277, Oct 30, 2009).

3.3 Revisions to define the change of owner and operator responsibilities for specific industry segments of subpart W (40 CFR 98.4)

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 1

Comment Excerpt: Regarding the proposed revisions to improve the quality of data collected for Subpart A when a change in ownership occurs, EPA's proposed revisions largely align with many of our members' current practices. While it appears the intent here is to provide clarity on how such data is currently tracked, more clarity is necessary in certain areas. For instance, PBPA members request that there needs to be consistency for who submits certifications, notice of transfers, and reports, with the recommendation that the responsible party should be the new owner/operator.

- In Subpart A 98.4 n(1) and (2), it is unclear who is responsible for filing the certificate of representation. It is recommended that it be clarified by direct language in this provision that the new owner or operator should file the certificate.
- In subpart A 98.4 n(4), it should be clarified that when multiple owners or operators acquire the emission sources from a facility, the new owners or operators should be the only entities submitting a notice of facilities that were purchased. The language as provided which includes reference to "current owner or operator" could result in confusion, and it is recommended instead that the phrase "…then the current owner or operator of the existing facility shall notify EPA within 90 days of the transaction that all the facility's emission sources were acquired by multiple purchasers…" be removed.
- We support the clarification in Subpart A 98.4 n(5) on who is responsible for correcting errors if reported prior to the transfer of facilities. However, while we would most likely want the seller to correct mistakes, PBPA requests clarification on EPA's intended purpose for the alternate designated representative. There is a potential that with the seller being responsible for correcting errors they would have a representative on the facility for the new owner and that they could have access to

current data and reporting. However, we suggest that the representative should only have access to data from years prior to the conclusion of the sale. The current language reads as follows, "That responsible entity will select a representative who will submit revisions to annual GHG reports under § 98.3(h) for that facility. If the selected individual is not the designated representative for the facility, the individual must be designated as the alternate designated representative or an agent for the facility." We recommend adding the following language to the end of this statement: "…for the reporting years prior to the sale of the facility."

Response: As noted in section III.A of the preamble to the final rule, the EPA is not taking final action in this final rule on proposed revisions to subpart A correlated with proposed amendments to subpart W (Petroleum and Natural Gas Systems). As noted in sections I.C and III.A of the preamble to the final rule, the EPA has issued a subsequent proposed rule for subpart W on August 1, 2023 (88 FR 50282) and has reproposed related amendments to subpart A in that separate action.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 37
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: The Industry Trades support efforts to clarify the reporting requirements for assets transferred during a reporting year. The following additional edits are offered to add further clarity. To further improve clarity, EPA should indicate under § 98.4(n)(1) and (2) that a certificate of representation, intended to reflect the new owner or operator, should be submitted by the new owner or operator. Similarly, under § 98.4(n)(4), EPA should indicate that only the new owner or operator should be responsible for notifying EPA of the purchase of a facility. Finally, as related to the correction of errors that were reported prior to the transfer of facilities under § 98.4(n)(5), EPA must clarify that the selected representative, the alternate designated representative, or agent for the facility is responsible only for addressing corrections for the reporting years prior to the sale of the facility.

Response: See response to comment EPA-HQ-OAR-2019-0424-0188-A1, Excerpt 1.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 15

Comment Excerpt: In the current proposal, it is not clear that the certificate of representation in § 98.4(n)(1) and (2) should be reported by the new owner or operator, as opposed to the previous owner. The Alliance recommends EPA specify that only the new operator will be responsible for this notification after transfer of ownership. This approach is further supported since EPA already has a record of the responsible official who submitted the report and their contact information.

Difficulties are common when a new owner is contacted about or attempts to answer questions for data submitted by prior owners. The suggested approach streamlines communication and would make responsibilities clear and consistent. Essentially, in the interest of having the most accurate information possible, EPA needs to require that those in the position of having the most potentially accurate information will be responsible for submitting it. For that same reason, corrections of errors that were reported prior to the transfer of facilities under § 98.4(n)(5) should be made by the selected representative, the alternate designated representative, or agent for the facility that submitted the data or report in question. The seller of the facility must bear the primary responsibility for reporting errors and corrections for the time period the facility was under that operator's control.

Response: See response to comment EPA-HQ-OAR-2019-0424-0188-A1, Excerpt 1.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 7

Comment Excerpt: The agency has provided new language that lays out the reporter responsibilities for instances where there is a transfer of ownership of a facility in the middle of a given calendar year. To further improve clarity, EPA should indicate under § 98.4(n)(1) and (2) that a certificate of representation, intended to reflect the new owner or operator, should be submitted by the new owner or operator. Similarly, under § 98.4(n)(4), EPA should indicate that only the new owner or operator should be responsible for notifying EPA of the purchase of a facility. Finally, as related to the correction of errors that were reported prior to the transfer of facilities under § 98.4(n)(5), EPA should clarify that the selected representative, the alternate designated representative, or agent for the facility is responsible only for addressing corrections for the reporting years prior to the sale of the facility.

Response: See response to comment EPA-HQ-OAR-2019-0424-0188-A1, Excerpt 1.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 1

Comment Excerpt: Under 40 CFR 98.4(n)(5), MSC suggests the responsibility for amending previous submitted reports following an acquisition or divestiture should be the responsibility of the owner/ operator at the time the report was submitted (responsibility for previously submitted reports should stay with the original submitter [seller]). This approach is further supported since EPA already has a record of the responsible official who submitted the report and their contact information. Difficulties are common when a new owner is contacted about or attempts to answer questions for data submitted by prior owners. The suggested approach streamlines communication and would make responsibilities clear and consistent.

Response: See response to comment EPA-HQ-OAR-2019-0424-0188-A1, Excerpt 1.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 16

Comment Excerpt: EPA proposes to inappropriately use Part 98—requiring reporting of GHG emissions—to mandate that private parties include particular provisions in their purchase and sale agreements for oil and natural gas facilities.

EPA proposes adding to 40 C.F.R. § 98.4 a new subsection (n), entitled "Alternative provisions for changes in owners and operators for industry segments with a unique definition of facility as defined in § 98.238." Included at § 98.4(n)(5) is the proposed provision: "Each owner or operator involved in a transaction that results in a change to the owner or operator of a facility shall, as part of the acquisition agreement or ownership transfer contract, agree upon the entity who will be responsible for revisions to annual GHG reports under § 98.3(h) for reporting years prior to the reporting year in which the transaction occurred."

This provision appears intended to require private parties to contract for compliance obligations, but the purpose behind this provision is unclear. Operators already have an obligation to submit to EPA annual Subpart W reports and EPA seems to be requiring new owners of oil and gas facilities to contractually agree to complete unperformed obligations of the previous owner. It is unclear whether EPA is taking the position that a new owner that contractually agrees to "make-up" for missed or inaccurate previous year annual reports also should be taking on regulatory obligations (and liability) as well.

In any event, it is inappropriate for EPA to dictate the terms of private contracts for the acquisition of a facility or the transfer of ownership. Indeed, EPA lacks the statutory authority to require private parties to contract for specific obligations.

Response: See response to comment EPA-HQ-OAR-2019-0424-0188-A1, Excerpt 1.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 37

Comment Excerpt: We generally support EPA's proposed revisions for reporting in cases of ownership transfer applicable to facilities in Onshore Petroleum and Natural Gas Production; Onshore Petroleum and Natural Gas Gathering and Boosting; Natural Gas Distribution; and Onshore Natural Gas Transmission Pipeline. We respectfully encourage EPA to strengthen its proposed approach by incorporating the recommendations described below to ensure ownership transfers do not strategically occur to cause emissions to become unreported, and when that will occur incidentally, that it is documented and disclosed. Ownership transfer is common in the oil and gas sector due to market volatility and other factors. In some circumstances, these transfers may be motivated in part by forthcoming regulations, corporate environmental commitments, and the methane waste charge recently enacted by Congress. Reporting in cases of ownership transfer should therefore account for these considerations and should not incentivize strategic transfers motivated by avoidance of otherwise applicable regulations, disclosure requirements, or the waste charge.

In recent years, stakeholders have grown increasingly concerned that oil and gas mergers and acquisitions may undermine emissions reduction efforts. If assets move from industry leaders in reducing emissions to companies without clear commitments and strong practices, emissions could increase and transparency could decrease, regardless of why the transactions take place. Traditional oil and gas deal making — blind to the climate implications of asset transfer — may not be compatible with a net zero world that demands sustained and proactive climate stewardship. Given the potential ramifications of oil and gas dealmaking, the "transferred emissions problem" has become increasingly important, especially as demand for decarbonization incentivizes companies to sell high-emitting assets. However, existing analysis has not captured the real scope of this problem, with sparse information on where upstream assets are moving and how asset transfers may impact climate outcomes.

A recent report by EDF analyzes global upstream oil and gas merger and acquisition data from 2017 through 2021, including specific high-risk transactions and the climate implications of oil and gas asset sales.[101] It finds that:

- A significant amount of upstream oil & gas deal making has taken place in recent years. Deal value in 2021 totaled $192 billion, exceeding annual deal value in 2015,

2016,2018, and 2020. Additionally, the aggregate number of deals in 2021 rose to 498, surpassing 2015, 2016, and 2020.

- Assets are flowing from public to private markets at a significant rate. Over the last five years, the number of public-to-private transfers exceeded the number of private-to public transfers by 64%. In each year during this period, public-to-private transfers comprised the largest share of deals.
- Assets are increasingly moving away from companies with environmental commitments.[102] In 2018, deals that moved assets away from companies with environmental commitments accounted for only 10% of transactions. By 2021, these deals accounted for 15% of transactions. During this same period from 2018 through 2021, more than twice as many deals moved assets away from operators with net zero commitments than the reverse.
- Stewardship risk in upstream oil and gas appears to be rising. The movement of upstream oil and gas facilities to private markets with traditionally less transparency and to companies with reduced environmental commitments suggests that a growing number of assets are at risk of weak climate stewardship.

EPA's proposed changes cover four scenarios of ownership transfer.

We are most concerned with the application of scenarios 3 and 4. The proposed changes, and EPA's prior interpretation of reporting requirements in cases of ownership transfer,[103] are ambiguous in situations where the transaction causes the facility to be divided such that portions fall below the reporting threshold and are not merged into existing facilities. These types of transactions are the most concerning because it is likely to lead to unreported emissions and could result in gaming of otherwise applicable requirements.

We recommend EPA clarify that when a transaction causes a facility to become split between multiple owners such that each portion falls below the reporting threshold, the seller must continue reporting until the conditions in 40 C.F.R. § 98.2(i) are met. Alternatively, or in situations where the seller will cease to exist, the purchasers should continue reporting for three to five years, as specified in 40 C.F.R. § 98.2(i)(1)- (2). We also urge EPA to clarify that 40 C.F.R. § 98.2(i)(3) only applies when the operations entirely cease to operate, not when they cease to be operated by the seller but continue to operate. Finally, EPA should require owners and operators to notify EPA when transactions occur and should track these transactions. We believe new regulatory requirements, corporate environmental commitments, and the methane waste charge result in at least some strategic asset transfers to avoid otherwise applicable requirements, and that EPA should track and publicly disclose these transactions.

Footnotes

[101] EDF, Transferred Emissions: How Risks in Oil and Gas M&A Could Hamper the Energy Transition (2022), https://business.edf.org/insights/transferred-emissions-risks-in-oil-gas-ma-could-hamper-the-energy-transition/.

[102] Corporate commitments as of Q1 2022 were applied retroactively to transactions over the last five years. For example, if a company had a net zero commitment as of Q1 2022, it would be listed as a net zero buyer or seller in a 2017 transaction, even if it did not have a net zero pledge in 2017.

[103] EPA, Frequently Asked Questions, https://ccdsupport.com/confluence/pages/viewpage.action?pageId=198705183.

Response: See response to comment EPA-HQ-OAR-2019-0424-0188-A1, Excerpt 1.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 9

Comment Excerpt: We generally support EPA's proposed revisions for reporting in cases of ownership transfer applicable to facilities in Onshore Petroleum and Natural Gas Production; Onshore Petroleum and Natural Gas Gathering and Boosting; Natural Gas Distribution; and Onshore Natural Gas Transmission Pipeline. However, we suggest that EPA adopt the recommendations described below to ensure ownership transfers do not strategically occur to cause emissions to become unreported, and when that will occur incidentally, that it is documented and disclosed. Ownership transfer is common in the oil and gas sector due to market volatility and other factors, and we expect it will continue and may be motivated in part by forthcoming regulations, corporate environmental commitments, and the methane waste charge recently enacted by Congress. Reporting in cases of ownership transfer should therefore account for these considerations and should not incentivize strategic transfers motivated by avoidance of otherwise applicable regulations, disclosure requirements, or the waste charge.

In recent years, stakeholders have grown concerned that oil and gas mergers and acquisitions in the oil and gas sector may undermine emissions reduction efforts. If assets move from industry leaders on the energy transition to industry laggards, emissions could increase and transparency could decrease, regardless of why the transactions take place. Traditional oil and gas dealmaking – blind to the climate implications of asset transfer – may not be compatible with a net zero world that demands sustained and proactive climate stewardship. Given the potential ramifications of oil and gas dealmaking, the "transferred emissions problem" has become an increasingly mainstream topic across the environmental community, especially as demand for decarbonization incentivizes companies to sell high-emitting assets. However, existing analysis has not captured the real scope of this problem, with sparse information on where upstream assets are moving and how asset transfers may impact climate outcomes.

We welcome EPA's proposed changes to clarify reporting in cases of ownership transfer. These proposed changes, and EPA's prior interpretation of reporting requirements in cases of ownership transfer,[40] are ambiguous in situations where the transaction causes the facility to be divided such that portions fall below the reporting threshold and are not merged into existing facilities. This type of transaction is the most concerning because it is likely to lead to unreported emissions and gaming of otherwise applicable requirements.

We recommend that EPA clarify that when a transaction causes a facility to fall below the reporting threshold, the seller must continue reporting until the conditions in 40 CFR 98.2(i) are

met. Alternatively, or in situations where the seller will cease to exist, the purchasers should continue reporting for three to five years, as specified in 40 CFR 98.2(i)(1)-(2). We also urge EPA to clarify that 40 CFR 98.2(i)(3) only applies when the operations entirely cease to operate, not only when they cease to be operated by the seller. Finally, EPA should require owners and operators to notify EPA when transactions occur and should track these transactions. New regulatory requirements, corporate environmental commitments, and the methane waste charge could drive strategic asset transfers to avoid otherwise applicable requirements, and that EPA should track and publicly disclose these transactions.

Footnotes

[40] United States Environmental Protection Agency, Q749. What are the notification requirements when an Onshore Petroleum and Natural Gas Production facility, reporting under Subpart W, sells wells and associated equipment in a basin? (last updated Sept. 26, 2019), https://ccdsupport.com/confluence/pages/viewpage.action?pageId=198705183.

Response: See response to comment EPA-HQ-OAR-2019-0424-0188-A1, Excerpt 1.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 2

Comment Excerpt: Under 40 CFR 98.4(n)(1-4), MSC suggests an allowance for an operator who acquires assets during a reporting period to utilize best available monitoring methods (BAMM) to submit emission estimates by the deadline of March 31, the following year. This approach would allow the operator to be in compliance and additional time to capture data needed to comply with the regulation. Often times, the seller may not have captured all data or there may not be enough time to transfer data and analyze it correctly by the new operator.

For example, when the Purchase and Sales Agreements are executed late in a calendar year, it presents challenges to both the seller and buyer to transfer data, understand data, calculate emissions, and submit a Subpart W report. In these cases, the opportunity to request an extension or use BAMM may be required. Examples where these options would be needed:

- An operator is below reporting threshold, but following an acquisition, the basin emissions would exceed the reporting threshold. In this case, the operator may not have all records as required by the rule for the reporting period.
- Prior owners may not have had all records required by the regulation or all records cannot be retrieved prior to the reporting deadline.

Response: See response to comment EPA-HQ-OAR-2019-0424-0188-A1, Excerpt 1.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 16

Comment Excerpt: Under 40 CFR 98.4(n)(1-4), the Alliance recommends an allowance for an operator who acquires assets during a reporting period to utilize best available monitoring methods (BAMM) to submit emission estimates by the deadline of March 31, the following year. This approach will allow the operator to comply by providing additional time to capture data needed to comply with the regulation. Oftentimes, the seller may not have captured all data or there may not be enough time to transfer data and analyze it correctly by the new operator. The assets may have been below the reporting threshold under the previous operator's control, but when collectively assessed following the acquisition, are above the reporting threshold under the new owner's control due to combination of assets in a reporting basin.

Response: See response to comment EPA-HQ-OAR-2019-0424-0188-A1, Excerpt 1.

3.4 Revisions to general definitions in 40 CFR 98.6

Commenter Name: Jessie Stolark
Commenter Affiliation: Carbon Capture Coalition (the Coalition)
Commenter Type: Other
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0206-A1
Comment Excerpt Number: 1

Comment Excerpt: Direct air capture (DAC) is expected to play an important role in meeting midcentury climate goals, as well as addressing legacy emissions in the atmosphere. As DAC projects reach commercial maturity, the GHGRP will need to be updated to ensure that DAC equipment owners can properly demonstrate the permanent storage or utilization of captured CO_2 to claim the 45Q tax credit. Therefore, the Coalition supports EPA revising 40 CFR 98.6 to add direct air capture to the list of suppliers of CO_2 and adding DAC to the definition of "carbon dioxide stream." Additionally, the Coalition supports the EPA using the statutorily defined definition of DAC in the Clean Air Act (42 U.S.C 7403(g)) for the purposes of the GHGRP.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0311-A1
Comment Excerpt Number: 8

Comment Excerpt: Additionally, EPA is proposing a change in the definition of "bulk" to:

"Bulk, with respect to industrial GHG suppliers and CO_2 suppliers, means a transfer of gas in any amount that is in a container for the transportation or storage of that substance such as cylinders, drums, ISO tanks, and small cans. An industrial gas or CO_2 that must first be transferred from a container to another container, vessel, or piece of equipment in order to realize its intended use is a bulk substance."

SIA requests EPA further clarify that the transfer of material from a "bulk" gas distribution system to individual equipment or smaller containers (to be used by the owner or operator), does not fall into the industrial GHG or CO_2 supplier category. Semiconductor manufacturing facilities employ gas systems that distribute gases from centralized, larger storage containers to smaller equipment and containers to be used on site. In some cases, the gas is purchased through an external supplier and then distributed to smaller containers for use onsite. In other cases, gases are produced onsite and subsequently distributed to smaller containers for use onsite. The onsite production of gases is particularly relevant for gaseous refrigerants and heat transfer fluids, H2 and CO_2. SIA requests that EPA clarify Subpart OO does not apply to the transportation or distribution of bulk gases.

Response: The EPA has revised the definition of bulk to clarify which import and export activities are reportable under subpart OO of part 98 (Suppliers of Fluorinated Greenhouse Gases). Consistent with the source category definition in 40 CFR 98.410(a), subpart OO will continue to apply to bulk importers and bulk exporters of fluorinated GHGs or nitrous oxide. Therefore, this revised definition will not affect domestic transporters or distributors of fluorinated GHGs or nitrous oxide who are not otherwise subject to subpart OO.

3.5 Revisions to chemical-specific GWPs in Table A–1

Commenter Name: David Miracle
Commenter Affiliation: Nucor Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0171-A1
Comment Excerpt Number: 3

Comment Excerpt: The proposed revisions to the Mandatory Greenhouse Gas Reporting Rule included various updates to Table A–1, Global Warming Potentials, which includes the additions of a few fluorocarbons and the change of a chemicals specific global warming potential (GWP). However, as proposed, Table A–1 will continue to require the use of AR4 GWP values (from the IPCC Fourth Assessment Report) for all CO_2e calculations using Equation A–1. Voluntary reporting under various voluntary standards and frameworks such as the GHG Protocol, Sustainability Accounting Standards Board (SASB) and CDP refer to the use AR5 (from the IPCC Fifth Assessment Report) GWP values. As such, Nucor is required to maintain two sets of calculations. By updating the factors in Table A–1 to AR5, the agency will not only be using the most up-to-date factors but also will provide consistency among reporting entities' various public disclosures.

Response: The commenter is correct that in the 2022 Data Quality Improvements Proposal, EPA proposed only minor updates to Table A–1. These included proposals to add a chemical-specific GWP for carbonic difluoride and to expand one of the F–GHG groups to which a default GWP of 1 is applied to include additional unsaturated fluorocarbons. However, as proposed in the 2023 Supplemental Notice, EPA proposed broader updates to Table A–1. Specifically, EPA proposed to (1) to adopt (or maintain) AR5 GWPs for GHGs that have GWPs listed in AR5, and (2) to adopt AR6 GWPs for GHGs that do not have GWPs listed in AR5. We are finalizing these proposed updates. Consistent with EPA's approach since the inception of the GHGRP, the final updates adopt AR5 and AR6 GWPs based on a 100-year time horizon.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 21

Comment Excerpt: The proposed revisions to the Mandatory Greenhouse Gas Reporting Rule included various updates to Table A–1, Global Warming Potentials. However, as proposed, Table A–1 will continue to require the use of AR4 GWP values (from the IPCC Fourth Assessment Report) for all CO_2e calculations. Reporting under various voluntary standards and frameworks, both in the U.S. and internationally, refer to the use AR5 (from the IPCC Fifth Assessment Report) GWP values. As such, SIA members are often required to maintain multiple sets of GHG calculations for compliance and voluntary reporting. By updating the factors in Table A–1 to ARS, the agency will not only be using the most up-to-date factors but also will provide consistency among reporting entities' various public disclosures.

SIA requests the use of IPCC Fifth Assessment Report global warming potentials to continue to align with international and voluntary reporting standards.

Response: See response to EPA-HQ-OAR-2019-0424-0191-A1, Excerpt 3.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 2

Comment Excerpt: Inclusion of the NOVEC Gases in Table A–1 Included in EPA's emissions calculation (eq DD-1) is a multiplication factor based on global warming potential (GWP) as provided in Table A–1 to subpart A. The Coalition recommends that Table A–1 be updated to

include two of the most common alternative gases: 3M™ Novec™ 4710 Insulating Gas (Iso-C3F7CN) and 3M™ Novec™ 5110 Insulating Gas (CF3C(O)CF(CF3)2). The European Union has proposed an update to its Regulation No 517/2014 on fluorinated greenhouse gases which includes GWP values for both in Annex III[1]:

Common name/industrial designation	Chemical formula	GWP	Novec™
Heptafluoroisobutyronitrile (2,3,3,3-tetrafluoro-2-(trifluoromethyl)-propenonitrile)	Iso-C_3F_7CN	2,750	4,710
1,1,1,3,4,4,4-Heptafluoro-3-(trifluoromethyl)butan-2-one	$CF_3C(O)CF(CF_3)_2$	0.29	5110

We recommend that US EPA include both values in Table A–1 to facilitate and harmonize forthcoming information from users of these gases.

Footnotes

[1] https://eur-lex.europa.eu/resource.html?uri=cellar:ecf2b875-b59f-11ec-b6f4-01aa75ed71a1.0001.02/DOC_2&format=PDF

Response: See response to EPA-HQ-OAR-2019-0424-0191-A1, Excerpt 3 for general information related to Table A–1 and proposed updates in the 2023 Supplemental Notice. In the 2023 Supplemental Notice, EPA proposed to adopt the chemical-specific 100-year GWP for Iso-C3F7CN published in AR6 (2,750), and EPA is finalizing that chemical-specific GWP in this rule. EPA did not propose, and is not finalizing, a chemical-specific GWP for CF3C(O)CF(CF3)2 because there is no chemical-specific GWP for that compound in AR6 or any other IPCC Assessment Report. Instead, that compound, a fluorinated ketone, is assigned the default GWP value of 1 that is applied to the fluorinated GHG group that includes fluorinated ketones.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type:
Comment Phase:
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 3

Comment Excerpt: The commenter supported updating to the newest published IPCC global warming potentials where relevant in Table A–1.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0305-A1
Comment Excerpt Number: 7

Comment Excerpt: EPA is proposing to revise Table A–1 to subpart A of part 98 (General Provisions) to update the global warming potential ("GWP") values of certain GHGs to reflect GWPs from Table 8.A.1 of the Intergovernmental Panel on Climate Change ("IPCC") Fifth Assessment Report ("AR5") and, for certain GHGs that do not have GWPs listed in AR5, to adopt GWP values from the Sixth Assessment Report ("AR6").[49] EPA is proposing to change methane from 25 to 28, using a 100 year GWP.[50] EIP supports this revision.

Footnotes

[49] 88 Fed. Reg. 32852, 32878 (May 22, 2023).

[50] Id. at 32878.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 10

Comment Excerpt: EPA proposes to update the current default Global Warming Potential (GWP) values for GHGs that are required to be reported under the GHGRP's various subparts.[33] The updated values would reflect the AR5 and would be consistent with recent IPCC guidance.[34] As discussed above, ensuring consistency and accuracy of the reported GHG data is important. To that end, it is appropriate to update the GWP values as EPA proposes.

Footnotes

[33] See 88 Fed. Reg. at 32,857-58.

[34] See id.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Patrick Serfass
Commenter Affiliation: American Biogas Council (ABC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0313-A1
Comment Excerpt Number: 2

Comment Excerpt: We support the 100-year time horizon for quantifying the Global Warming Potential (GWP) of methane emissions and the increase in GWP for methane from 25 to 28, recognizing that adjustments are based on new and improved data.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 1

Comment Excerpt: GPA supports EPA's decision to continue utilizing the GWP-100 values in the GHG Reporting Program. Given that the prime objective under Article 2 of the United Nations Framework Convention on Climate Change ("UNFCCC") is to "achieve…stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system," any movement towards a reporting framework that reduces mitigation focus on CO_2 and adds to long-term warming potential compared to the present 100-year GWP framework would not be well justified.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 1

Comment Excerpt: The Industry Trades support EPA's proposal to update the Global Warming Potentials (GWPs) for calculating CO_2-equivalent (CO_2e) emissions of non-CO_2 gases (CH_4, N_2O, HFCs, PFCs, SF_6, and NF_3) to reflect updated estimates contained in the Intergovernmental Panel on Climate Change's (IPCC's) Fifth Assessment Report (AR5), based

on a 100-year time horizon. We agree with EPA's proposal to use the 100-year GWP for methane. The proposed GWP changes to Table A–1 in Subpart A are aligned with the Inventory of U.S. Greenhouse Gas Emissions and Sinks [*i.e.*, the U.S. EPA GHG Inventory (GHGI)] and complies with the United Nations Framework Convention on Climate Change (UNFCCC) decision to use GWP values from the IPCC AR5 in national reporting by countries by the end of 2024.

The Industry Trades request that EPA clarify in the preamble to this proposed rulemaking the impacts on the reported total CO_2e emissions due to changing the GWP (particularly for methane), without any actual change in mass emissions. With an increased focus on methane emissions from the oil and natural gas industry, it is important to inform stakeholders that future increases in CO_2e emissions due to the change in GWP are not reflective of any actual mass emission increases. Likewise, the Industry Trades recommend that the EPA acknowledge that combustion CO_2e emissions will be impacted from both the reduction in N_2O GWP, as well as the increase in CH_4 GWP.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 9

Comment Excerpt: The Supplemental Notice proposes to update global warming potential (GWP) values and references the 100-year time horizon GWP from Table 8.A.1 of the IPCC Fifth Assessment Report ("AR5") for methane and N_2O. The Associations understand these updates are being completed to ensure consistency across EPA programs and with international reporting conventions. The Associations also understand that this update is necessary to ensure consistency with other national and international reporting regimes and supports using the 100-year basis for GWP. Some state programs and analysis in the literature consider other time horizons (*e.g.*, 20 years), but it is appropriate for EPA and other federal programs to retain the 100-year basis for GWP.

For reporting, unless offset by a reduction in year-to-year methane emissions, this revision will result in an apparent "increase" in annual CO_2 equivalent methane emissions from natural gas operations, even if there is no actual emissions increase or even a decrease in actual emissions. Such reporting changes can be misconstrued by the public and third parties that review EPA data and documentation. To avoid unfounded concerns about emission trends and in an effort to provide the most accurate and accessible information, when publicly releasing GHGRP data following the GWP change, EPA should clearly communicate to the public and other stakeholder

the implications of GWP on annual emission increases that are due to this computational change rather than an actual increase in methane emissions.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0321-A1
Comment Excerpt Number: 5

Comment Excerpt: INGAA supports EPA's continued utilization of the 100-year global warming potential (GWP) value for methane and N_2O GWP from Table 8.A.1 of the IPCC Fifth Assessment Report. EPA needs to ensure that GHGRP data releases following this reporting change include a clear explanation regarding resulting increases in annual CO_2e emissions from methane emissions reported.

The Supplemental Notice updates global warming potential (GWP) values and references the 100- year time horizon GWP from Table 8.A.1 of the IPCC Fifth Assessment Report ("AR5") for methane and N_2O. INGAA understands these updates are being completed to ensure consistency across EPA programs and with international reporting conventions. INGAA supports the continued utilization of the 100-year basis for GWP. Some state programs and analysis in the literature consider other time horizons (*e.g.*, 20 years) but it is appropriate for EPA and other federal programs to retain the 100-year basis for GWP.

For reporting, unless offset by a reduction in year-to-year methane emissions, this revision will result in a reporting increase in annual CO_2 equivalent methane emissions from natural gas operations. Such changes can be misconstrued by the public and third parties that review EPA data and documentation. To avoid unfounded concerns about emission trends, when publicly releasing GHGRP data following the GWP change, EPA should clearly communicate to the public the implications of GWP on annual CO_2e emission increases that are due to this computational change rather than an actual increase in methane emissions.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 1

Comment Excerpt: We support EPA's proposed updates to global warming potential (GWP) values based on the most recent IPCC Sixth Assessment Report. This will ensure the climate metrics used in reporting are consistent with the latest and best science.

We recommend that EPA consider incorporating GWP on multiple time horizons in the reporting requirement or when publicizing reported emissions. The GWP metric allows comparisons of different pollutants against the warming potency of carbon dioxide over a specified time interval. The 100-year time horizon GWP (GWP100) is the most commonly utilized metric. While GWP100 is an indication of a non-CO_2 pollutant's warming potency relative to CO_2 over 100 years, it does not capture the near-term potency of short-lived gases like methane and hydrogen.[3] For example, methane's GWP100 is 27-30 times that of carbon dioxide, while its 20-year global warming potential (GWP20) is 80-83 times higher.[4] Hydrogen's GWP for a 20-year time horizon similarly yields a potency that is three times its 100-year impact.[5] Therefore, relying solely on GWP100 is insufficient to reflect a pollutant's warming power over time.

It is important to acknowledge the near-term warming potency of short-lived gases such as methane because they play a critical role in driving the rate of warming for the near future.[6] Recent study suggests that record-breaking extreme heat events can increase in frequency and probability with faster rate of warming, in addition to the overall warming level.[7] The path dependency of such record-shattering climate events is evidence that near-term warming is as much a concern as long-term warming over the course of the century. Limiting near-term warming is also critical from a policy perspective and directly relevant to EPA's efforts under the Clean Air Act. Given that the impacts of climate change are already perceptible across societies and ecosystems on every continent and in every ocean, we must minimize near-term warming as much as possible to limit further damage. It is important to incorporate the use of additional time horizons, such as GWP20, that convey the near-term impacts of non-CO_2 gases alongside their long-term impacts indicated by GWP100.

Footnotes

[3] Ocko et al., Unmask Temporal Trade-offs in Climate Policy Debates, 356 Science 6337 (2017), https://www.science.org/doi/10.1126/science.aaj2350.

[4] Forster et al., The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity, Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, 923–1054 (2021), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07.pdf.

[5] Sand et al., A Multi-Model Assessment of the Global Warming Potential of Hydrogen, 4 Comm. Earth & Environment 203 (2023), https://www.nature.com/articles/s43247-023-00857-8

[6] Ocko et al., Acting Rapidly to Deploy Readily Available Methane Mitigation Measures by Sector Can Immediately Slow Global Warming, 16 Environ. Res. Lett. 054042 (2021), https://doi.org/10.1088/1748-9326/abf9c8.

[7] Fischer et al., Increasing Probability of Record-Shattering Climate Extremes, 11 Nat. Climate Change (2021), https://doi.org/10.1038/s41558-021-01092-9.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Michael E. Van Brunt
Commenter Affiliation: Covanta Energy, LLC
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0308-A1
Comment Excerpt Number: 6

Comment Excerpt: We ask that the EPA reconsider its use of the 100-year global warming potential (GWP) for methane, considering the pressing need to reduce methane emissions over the next several decades to avoid the most significant impacts of climate change. This change would be in alignment with California, New York, and New Jersey who have all adopted time frames where methane is 84-86 times more potent than carbon dioxide over a 20-year period.[27, 28, 29] There is no scientific reasoning for selecting the 100-year GWP compared to other metrics; it depends solely on the policy objectives one has in mind. [31] Because of the temperature time constraint and the fact that SLCPs contribute over 40% to current anthropogenic global radiative forces, policy objectives should emphasize decreasing SLCP emissions.[32] Literature since Assessment Report 5 (AR5) has concluded that the 100-year GWP is not well-suited to represent the warming effect at specific points in time from sustained SLCPs.[33, 34] Studies find that the 20-year GWP provides the most accurate perspective on the speed at which SLCP emissions will impact the atmosphere and, thus, the effectiveness of SLCP emission controls. [35] The use of the 20-year GWP best captures the importance of SLCPs and would provide policymakers with the most accurate information when considering climate policies with the potential to make the most considerable impact in the near future.

Footnotes

[27] CARB (2017) Short-Lived Climate Pollutant Reduction Strategy. URL: https://ww2.arb.ca.gov/sites/default/files/2020- 07/final_SLCP_strategy.pdf

[28] N.J. 218th Legislature S.3215 (2018). URL: https://www.njleg.state.nj.us/2018/Bills/S3500/3215_R1.PDF

[29] Climate Leadership and Community Protection Act, S.6599 / A.8429, 2019-2020 Regular Sessions (New York, 2019).URL: https://www.nysenate.gov/legislation/bills/2019/S6599

[31] See p. 226 of Intergovernmental Panel on Climate Change (2022), Working Group III Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. URL: https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf

[32] California Environmental Protection Agency, 2017. Short-Lived Climate Pollutant Reduction Strategy. URL: https://ww2.arb.ca.gov/sites/default/files/2020-07/final_SLCP_strategy.pdf, Climate Pollutant Reduction Strategy (ca.gov)

[33] Allen, M.R. et al., 2016: New use of global warming potentials to compare cumulative and short-lived climate pollutants. Nat. Clim. Change., 6(8), 773–776. URL: https://www.nature.com/articles/nclimate2998

[34] Cain, M. et al., 2019: Improved calculation of warming-equivalent emissions for short-lived climate pollutants. Clim. Atmos. Sci., 2(1), 29. URL: https://www.nature.com/articles/s41612-019-0086-4

[35] California Environmental Protection Agency, 2017. Short-Lived Climate Pollutant Reduction Strategy. URL: https://ww2.arb.ca.gov/sites/default/files/2020-07/final_SLCP_strategy.pdf ed Climate Pollutant Reduction Strategy (ca.gov)

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Monica Prabhu
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0285
Comment Excerpt Number: 1

Comment Excerpt: It seems prudent to use the 20-year GWP from AR6 for short-lived climate pollutants like methane to accurately track the impact of reductions and emissions. Historic inventories should be updated to reflect the role that "short lived climate pollutants" (SLCPs) play and that methane (CH_4) emissions reductions NOW are as important as CO_2 reductions in the long term. Standardizing on the 20-year GWP for SLCPs highlights the urgency and impact of moving quickly to incentivize emissions reductions and penalize emissions when it matters most, in this "decisive decade" for the climate.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0305-A1
Comment Excerpt Number: 8

Comment Excerpt: EPA should also include the 20-year timescale in its revisions. It is important to consider the effects of methane on a 20-year timescale because climate change is already causing significant harm, including through sea-level rise, flooding, wildfires and drought. Because methane is such a powerful greenhouse gas, curbing methane emissions in the near-term is a crucial part of the fight against climate change. Accordingly, EPA should include both the 100 year and 20-year timescale in its revisions to GWP values in this GHGRP Supplemental Proposal.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Susan Glickman
Commenter Affiliation:

Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0309
Comment Excerpt Number: 2

Comment Excerpt: Given the imperative to reduce methane emissions, the EPA should reconsider its use of the 100-year global warming potential (GWP) for methane and instead adopt the 20-year GWP. The 20-year GWP more accurately represents the potent, but short life span of methane in the atmosphere. In order to create effective methane reduction policies, it is crucial that policymakers are provided with the GWP which best characterizes methane's relative importance in the fight against climate change in the near future.

Response: See section III.A.2.a of the preamble to the final rule for the EPA's response to this comment.

3.6 Comments on other revisions and clarifications to subpart A

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 8

Comment Excerpt: The agency has proposed to limit, to 180 days, the number of days during which a reporter may request to extend the time period for resolving a substantive error either by submitting a revised report or by providing information demonstrating that the previously submitted report does not contain the alleged substantive error. We request that the agency not place an inflexible cap on the number of days to resolve reporting issues. These extensions can be helpful for newly affected sources, when there is a change in facility ownership, and in other situations. Alternatively, the agency should increase the limit of the total number of days a reporter can request an extension beyond the currently proposed 180 days to provide reporters more time to work through the current and new provisions in the program.

Response: See section III.A.2.b of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 36
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: The Industry Trades are concerned that the limitation of an extension request to correct a substantive error is not sufficiently detailed and may result in arbitrarily short time-periods in which an operator may correct an error - especially in cases where the correction may not be accepted. EPA must add additional language to clarify that the 180-day limit would restart if the correction is not accepted by EPA. For instance, if an operator makes a good faith effort to correct a substantive reporting error but that correction is not accepted by EPA, the operator could be left with insufficient time to make corrections that are acceptable.

The Administrator should restart the 180-day extension request opportunity for each instance in which an operator is notified of a substantive error or rejected correction. This should apply to all conditions in which the Administrator may have directed an operator to revise a report. Such conditions include if a correction is rejected, if additional corrections are requested, if corrections span more than one reporting year, or if EPA responses to operator questions are delayed.

Response: See section III.A.2.b of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 35
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: We recommend that EPA establish a threshold by which an error can be deemed substantive. The purpose for such a threshold would be to enable operators to document errors that are not substantive, rather than resubmitting a report for all errors. Currently, operators may be required to resubmit past reports (of up to 3 years) regardless of the magnitude or impact of the error. In some cases, where the error is not substantive, this requirement can result in a significant burden on the operator with little benefit to the EPA, the reporting program, or the general public.

EPA should apply a percentage threshold to the impact on the quantity of GHG emissions reported to ensure that the burden faced by reporters is commensurate with the impact on the quantity of GHG emissions reported. We suggest a threshold of 5% of total GHG emissions reported, applied starting with the first of year reporting subject to the finalized rule and not to previously submitted data, which is generally consistent with the rule-of-thumb applied in many ISO GHG emissions quantification methodology standards.

Response: We did not propose and are not taking final action in this rule on the revision requested by the commenter; this requested revision is outside the scope of this final rule. As noted in the preamble for the December 17, 2010 rule, in establishing the existing requirements EPA determined that it is not appropriate to establish a threshold below which errors do not have to be corrected and resubmitted. Under the existing regulations, if there is an error in the GHG

estimate, then that emissions error must be corrected and the annual GHG emissions report resubmitted. The reporter should have all the information necessary to report the revised estimate based on the process for calculating the initial estimate (75 FR 79103, Dec 17, 2010).

4.0 Comments on Subpart B of Part 98

4.1 Comments on whether collecting data for indirect (Scope 2) emissions is within the scope of Part 98

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 29

Comment Excerpt: Clean Air Act section 114 grants broad authority to EPA to require "any person... who the Administrator believes may have information necessary for the purposes set forth in this subsection" to "establish and maintain such records," "make such reports," and "provide such other information as the Administrator may reasonably require.[232] Those requirements are not limited to owners and operators of emission sources.[233] Further, the purposes of the subsection include, among other things, "developing or assisting in the development of any implementation plan under section … 111(d) [or] any standard of performance under section 111.[234] Thus, by its terms, section 114 authorizes EPA to require reporting of information by owners and operators of non-sources, such as electrified equipment, if that information would advance new source performance standards or emission guidelines for existing sources undersection 111.

Information on the quantities and attributes of energy consumption, including electricity purchases, for facilities across all industrial subsectors is essential to evaluating greenhouse gas mitigation strategies for those subsectors. For example, as EPA has noted in the prior rulemaking, data on energy consumption could reveal potential emission reduction opportunities from implementing energy-efficiency measures.[235] In addition, this information could improve EPA's and other stakeholders' understanding of the degree to which an industrial subsector has already electrified; the amounts of electricity required for equipment of different sizes, applications, and geographic locations; the qualities of the electricity purchased, such as the market type and renewable attributes; and the potential reduction in direct and indirect emissions from electrifying or from timing electricity use to hours in which overall demand is low. In turn, the information could shape EPA's analysis of the feasibility, cost, and efficacy of reducing emissions through electrification in various subsectors, as well as the impacts of the incidental electrification that results when sources comply with regulatory requirements premised on other control techniques.

Footnotes

[232] 49 U.S.C. § 7414(a)(1).

[233] See id.

[234] Id. at § 7414(a).

[235] 74 Fed. Reg. at 56,260, 56,289 (Oct. 30, 2009).

Response: The EPA is not taking final action in this final rule on proposed amendments to add subpart B (Energy Consumption) at this time. See section III.B of the preamble for the final rule for additional information.

For discussion of the legal authority for revisions in this final rule, which references the authority EPA has articulated for the existing GHGRP since initial promulgation, see section I.D of the preamble for the final rule and section 39 of this Response to Comments document.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 47

Comment Excerpt: CAA section 114 grants broad authority to EPA to require "any person … who the Administrator believes may have information necessary for the purposes set forth in this subsection" to "establish and maintain such records," "make such reports," and "provide such other information as the Administrator may reasonably require." 42 U.S.C. § 7414(a)(1). Those requirements are not limited to owners and operators of emission sources. See id. Further, the purposes of the subsection include, among other things, "developing or assisting in the development of any implementation plan under section … 111(d) [or] any standard of performance under section 111." Id. § 7414(a). Thus, by its terms, section 114 authorizes EPA to require reporting of information by owners and operators of non-sources, such as electrified equipment, if that information would advance new source performance standards or emission guidelines for existing sources under section 111.

Information on the quantities and attributes of energy consumption, including electricity purchases, for facilities across all industrial subsectors is essential to evaluating GHG mitigation strategies for those subsectors. For example, as EPA has noted in the prior rulemaking, data on energy consumption could reveal potential emission reduction opportunities from implementing energy-efficiency measures. 74 Fed. Reg. 56260, 56289 (Oct. 30, 2009). In addition, this information could improve EPA's and other stakeholders' understanding of the degree to which an industrial subsector has already electrified; the amounts of electricity required for equipment of different sizes, applications, and geographic locations; the qualities of the electricity purchased, such as the market type and renewable attributes; and the potential reduction in direct and indirect emissions from electrifying or from timing electricity use to hours in which overall demand is low. In turn, the information could shape EPA's analysis of the feasibility, cost, and efficacy of reducing emissions through electrification in various subsectors, as well as the impacts of the incidental electrification that results when sources comply with regulatory requirements premised on other control techniques.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: S. Dear Schramm-Satayathum
Commenter Affiliation: Citizens Energy Group
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0298-A1
Comment Excerpt Number: 1

Comment Excerpt: Citizens [Energy Group] appreciates the EPA's position that the collection of energy consumption data through the proposed Subpart B will enable thoughtful policy making on greenhouse gas emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 4

Comment Excerpt: EPA should consider not moving forward with requiring energy consumption reporting in order to attempt to quantify or estimate indirect emissions from facilities. First, and most importantly, indirect emissions fall outside of EPA's legal authority with respect to the GHGRR, since the statutory basis of the GHGRR is gathering information that could be used in developing or enforcing certain source-specific regulations under the Clean Air Act (CAA). As EPA notes in the preamble, the Agency's authority to require emissions reporting from sources is grounded in Clean Air Act section 114. See 87 Fed. Reg. 36924-25. In this instance, the text of CAA 114 is instructive:

> (a) AUTHORITY OF ADMINISTRATOR OR AUTHORIZED REPRESENTATIVE
> For the purpose (1) of developing or assisting in the development of any implementation plan undersection 7410 or section 7411(d) of this title, any standard of performance under section 7411 of this title, any emission standard under section 7412 of this title, or any regulation of solid waste combustion undersection 7429 of this title, or any regulation under section 7429 of this title (relating to solid waste combustion), (ii) of determining whether any person is in violation of any such standard or any requirement of such a plan, or (iii) carrying out any provision of this chapter (except a provision of subchapter II with respect to a manufacturer of new motor vehicles or new motor vehicle engines)
>
> (1) the Administrator may require any person who owns or operates any emission source, who manufactures emission control equipment or process equipment, who the

> Administrator believes may have information necessary for the purposes set forth in this subsection, or who is subject to any requirement of this chapter (other than a manufacturer subject to the provisions of section 7525(c) or 7542 of this title with respect to a provision of subchapter IT) on a one-time, periodic or continuous basis to— (A) establish and maintain such records; (B) make such reports; (C) install, use, and maintain such monitoring equipment, and use such audit procedures, or methods; (D) sample such emissions (in accordance with such procedures or methods, at such locations, at such intervals, during such periods and in such manner as_ the Administrator shall prescribe); (E) keep records on control equipment parameters, production variables or other indirect data when direct monitoring of emissions is impractical; (F) submit compliance certifications in accordance with subsection (a)(3); and (G) provide such other information as the Administrator may reasonably require...

The text of CAA section 114 clearly demonstrates that EPA's authority to require reporting of information is limited to that information relevant to inform the development of potential regulatory requirements under CAA sections 110 (National Ambient Air Quality Standards), 111 (new and existing source performance standards), 112 (standards for hazardous pollutants), and 129 (solid waste combustion standards). These programs regulate direct emissions from sources that fall into certain, defined categories, sources which therefore report those emissions to EPA under the GHGRR. Accordingly, collecting information about "indirect" emissions that is not necessary to the development or implementation of standards under the source-specific programs cited in CAA section 114 is not consistent with EPA's statutory mandate underpinning the GHGRR. EPA acknowledges this limitation in the preamble: "The data collected under part 98 are used to information EPA's understanding of the relative emissions and distribution of emissions from specific industries...and to inform policy options and potential regulations." 87 Fed. Reg. at 36,926. EPA does not indicate in the request for information about possible reporting requirements for indirect emissions related to electricity production that any potential regulations of these emissions are under consideration. Since indirect emissions are not regulated under any CAA program, EPA cannot argue that speculative indirect emissions data is "reasonably require[d]" by the Administrator for any CAA purpose. Similarly, asserting that this data would "complement" the Agency's interest in renewable energy and energy efficiency is insufficient. See id. at 37,018. As a result, EPA lacks regulatory authority over these emissions and cannot impose data reporting burdens that can have no ultimate regulatory purpose within the bounds set forth in CAA and as specifically enumerated in section 114. EPA's proposal that only those entities that already are required to report emissions under the GHGRR be required to report indirect emissions related to energy consumption, see 87 Fed. Reg. 37,018, does not overcome EPA's fundamental lack of authority to collect data about emissions that it cannot regulate under the enumerated CAA programs. EPA's proposal to limit data reporting to on-site energy consumption, see id. at 27,017, also fails to remedy EPA's lack of authority. These emissions are not generated on-site and are not related to the source category that would be reporting these emissions and are largely reported as direct emissions under other GHGRR subparts.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Debra J. Jezouit
Commenter Affiliation: Class of '85 Regulatory Group
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0250-A1
Comment Excerpt Number: 1

Comment Excerpt: In the 2009 GHG Reporting Rule Proposal, EPA sought comment on, but did not propose to adopt, the reporting of electricity purchase data, which would allow indirect emissions for facilities to be calculated without requiring facilities to report indirect emissions.[3] The Class of '85 submitted comments supporting EPA's decision not to propose such a reporting requirement, citing concerns that it could lead to double counting of GHG emissions when electricity is both produced and consumed.[4]

In the Proposed Rule, EPA is again seeking comment on whether to develop regulations on reporting related to electricity consumption. Specifically, in the Proposed Rule EPA seeks comment on "whether EPA should expand the GHG [Reporting Program] so that facilities that are subject to the GHG [Reporting Program] would be required to submit new, summary data elements quantifying their consumption of purchased energy products and characterizing associated markets and products (*e.g.*, regulated or de-regulated electricity markets and renewable attributes of purchased products)."[5]

The Potential Energy Consumption Rule is outside the scope of EPA's authority under Section 114 of the CAA.[8] The reporting and measurement of such "scope 2" emissions go beyond CAA Section 114, which authorizes reporting for the purpose of developing standards of performance, any emission standard, or solid waste combustion. EPA suggests that the reporting would "provide[] valuable information to the EPA and stakeholders in the development of climate change policy and programs," which is not one of the purposes enumerated in CAA Section 114.

In the Proposed Rule, EPA also refers to the FY 2008 Consolidated Appropriations language, stating that "[i]n 2009, we responded to [] concerns stating that collection of electricity purchase data under the GHG [Reporting Program] is consistent with Consolidated Appropriations language."[9] In the Final 2009 GHG Reporting Rule, EPA notes that "[w]hile the Consolidated Appropriations Act required EPA to spend a certain amount of money on a rule requiring mandatory reporting of GHG emissions, the authority to gather such information already existed in the CAA."[10]

Although the GHG Reporting Program as finalized in 2009 may have been authorized by the CAA, nothing in the CAA appears to grant EPA the authority to collect information on electricity consumption nor is it apparent that EPA would have this authority under any other current statute. EPA's authority under the CAA and the GHG Reporting Program is limited to those emissions directly released by a facility that are applicable to regulation, not emissions from other facilities that may be related to electricity production. The Class of '85 is concerned that EPA would exceed its CAA authority by pursuing the Potential Energy Consumption Rule and urges EPA not to proceed with such a rulemaking.

Footnotes

[3] See 74 Fed. Reg. 16,479 (April 10, 2009).

[4] See Comments of The Class Of '85 Regulatory Response Group on the Proposed Rule Regarding Mandatory Reporting Of Greenhouse Gases, Comment ID No. EPA-HQ-OAR-2008-0508-0455 (June 10, 2009).

[5] See 87 Fed. Reg. 36,920, 37,018 (June 21, 2022).

[8] 42 U.S.C. § 7414.

[9] Id. at 37,017-18.

[10] 74 Fed. Reg. 56,286 (Oct. 30, 2009).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 4

Comment Excerpt: With little discussion, EPA dismisses concerns raised by commenters, including EEI, in response to last year's request for comment on the collection of energy consumption data.[14] This is not a sufficient response. EPA has not grappled with the limits that the CAA places on its authority to regulate emissions from covered sources and the concomitant limits that this places on its authority to collect data in service of regulating direct emissions. EPA is regulator, not a policymaker, and its regulatory authority is confined to that provided by the CAA.

EPA's legal authority with respect to the GHGRP is limited to gathering information that could be used in developing or enforcing certain source-specific regulations under the Clean Air Act (CAA). As EPA notes in the preamble, the Agency's authority to require emissions reporting from sources is grounded in Clean Air Act section 114.[15] In this instance, the text of CAA 114 is instructive:

(a) AUTHORITY OF ADMINISTRATOR OR AUTHORIZED REPRESENTATIVE For the purpose (i) of developing or assisting in the development of any implementation plan under section 7410 or section 7411(d) of this title, any standard of performance under section 7411 of this title, any emission standard under section 7412 of this title, or any regulation of solid waste combustion under section 7429 of this title, or any regulation under section 7429 of this title (relating to solid waste combustion), (ii) of determining whether any person is in violation of any such standard or any requirement of such a plan, or (iii) carrying out any provision of this chapter (except a provision of subchapter II with respect to a manufacturer of new motor vehicles or new motor vehicle engines)—

(1) the Administrator may require any person who owns or operates any emission source, who manufactures emission control equipment or process equipment, who the Administrator believes may have information necessary for the purposes set forth in this subsection, or who is subject to any requirement of this chapter (other than a manufacturer subject to the provisions of section

7525(c) or 7542 of this title with respect to a provision of subchapter II) on a one-time, periodic or continuous basis to—

(A) establish and maintain such records;

(B) make such reports;

(C) install, use, and maintain such monitoring equipment, and use such audit procedures, or methods;

(D) sample such emissions (in accordance with such procedures or methods, at such locations, at such intervals, during such periods and in such manner as the Administrator shall prescribe);

(E) keep records on control equipment parameters, production variables or other indirect data when direct monitoring of emissions is impractical;

(F) submit compliance certifications in accordance with subsection (a)(3); and

(G) provide such other information as the Administrator may reasonably require…

42 U.S.C. § 7414(a)(1). The text of CAA section 114 clearly demonstrates that EPA's authority to require reporting of information is limited to that information relevant to inform the development of potential regulatory requirements under CAA sections 110 (National Ambient Air Quality Standards), 111 (new and existing source performance standards), 112 (standards for hazardous pollutants), and 129 (solid waste combustion standards). None of these programs regulate indirect emissions or energy consumption that is non-emitting, but instead focus on emissions from sources that fall into certain, already defined categories. Accordingly, EPA has not and cannot demonstrate that collecting information about energy consumption is necessary to the development or implementation of standards under the source-specific programs cited in CAA section 114.[16]

Moreover, because indirect emissions are not regulated under any CAA program, EPA cannot assert future policy development justifies the collection of this data. While EPA staff may have a general interest in energy efficiency or consumption data, EPA lacks regulatory jurisdiction to address these (as discussed in more detail below). EPA cannot impose data reporting burdens that can have no ultimate regulatory purpose within the bounds set forth in CAA and as specifically enumerated in section 114, EPA's claimed source of authority for the GHGRP.

Footnotes

[14] See 88 Fed. Reg. at 32,887 (noting that EPA "disagrees" with commenters asserting a vague "policy" interest in this data).

[15] See 87 Fed. Reg. 36924-25.

[16] EPA acknowledges this limitation in the preamble: "The data collected under part 98 are used to information EPA's understanding of the relative emissions and distribution of emissions from specific industries…and to inform policy options and potential regulations." 87 Fed. Reg. at 36,926. EPA does not indicate in the request for information about possible reporting requirements for indirect emissions related to electricity production that any potential regulations of these emissions are under consideration.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 19

Comment Excerpt: The Landfill Industry Commenters object to the inclusion of Proposed Subpart B within the GHGRP at Part 98, governing energy consumption, on the basis that the information that would be collected under proposed subpart is outside EPA's authority under 114 of the Clean Air Act, would be excessively burdensome, and would produce data of little value to the overall goals of the GHGRP.

Section 114 of the Clean Air Act confers broad authority on EPA to collect information for the following purposes:

For the purpose (i) of developing or assisting in the development of any implementation plan under section 7410 or section 7411(d) of this title, any standard of performance under section 7411 of this title, any emission standard under section 7412 of this title,,[1] or any regulation of solid waste combustion under section 7429 of this title, or any regulation under section 7429 of this title (relating to solid waste combustion), (ii) of determining whether any person is in violation of any such standard or any requirement of such a plan, or (iii) carrying out any provision of this chapter (except a provision of subchapter II with respect to a manufacturer of new motor vehicles or new motor vehicle engines)

Clearly, data relating to purchased energy products will not be used to assist EPA in the development of an implementation plan under Section 110 of the Clean Air Act (governing plans for the implementation, maintenance and enforcement of National Ambient Air Quality Standards), or standards under Sections 111, 112, or 129 of the Clean Air Act (governing direct emissions from categories of stationary sources), or in determining whether a person is in violation of such a standard or requirement. In the preamble to the proposed rule, the Agency acknowledges that energy consumption data would not reflect direct emissions associated with reporters' operations but would instead represent indirect or Scope 2 emissions. The Agency claims that such information is necessary to gain an improved understanding of the energy intensity of specific facilities or sectors, and to better inform its understanding of energy needs and the indirect GHG emissions associated with certain sectors. See 88 Fed. Reg. at 32885. The Agency also asserts that this purpose is consistent with Section 114 of the Clean Air Act, which allows EPA to use its information request authority for "carrying out any provision of this chapter." 88 Fed. Reg. at 32887. EPA further claims that reading Section 114 narrowly to preclude such usage would "hinder the EPA's ability to implement" a variety of duties under the Clean Air Act that extend to regulatory and non-regulatory programs and would "subvert Congressional intent." Id.

The Landfill Industry Commenters disagree with the Agency's broad interpretation of Section 114, and that disallowing Subpart B would somehow subvert Congressional intent. In the

preamble for the original rule, EPA noted that the joint explanatory statement accompanying the FY 2008 Consolidated Appropriations Act directed EPA to "include in its rule reporting of emissions resulting from upstream production and downstream sources, to the extent that the Administrator deems it appropriate." 74 Fed. Reg. at 56264. The proposed Subpart B explicitly "does not require the reporting of either direct or indirect greenhouse gas emissions." 88 Fed. Reg. at 32924.

The preamble for the original rule goes on to note that numerous other programs were already in place to collect relevant information:

As described in Sections I.C and D of this preamble as well as in the comment response sections, there are several existing programs at the Federal, regional, and State levels that also collect valuable information to inform and implement policies necessary to address climate change. Many of these programs are focused on cost-effectively reducing GHG emissions through improvements in energy efficiency and by other means.

74 Fed. Reg. at 56264.

The Agency has not provided any supporting information to demonstrate that these existing programs are inadequate or no longer available, and instead relies on vague generalizations about its need for the information that would be reported under Subpart B, and fails to show any direct linkage to the standards or programs EPA carries out or intends to carry out under the Clean Air Act. Further, EPA seems to erroneously conclude that such information is readily available or otherwise would not impose a heavy burden on reporters. We disagree; the MEMP provisions and reporting requirements impose obligations that are neither necessary or appropriate for reporters of direct emissions, and represents information that could be sourced elsewhere, including from the power generating facilities that report direct emissions associated with the produced energy.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Angie Burkhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0320-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA states that it is proposing to require reporting of metered energy consumption from direct emitter facilities that currently report under part 98 in order to gain an improved understanding of the energy intensity (*i.e.*, the amount of energy required to produce a given level of product or activity) of specific facilities or sectors, and to better inform our understanding of the potential indirect GHG emissions associated with certain sectors (emphasis added, 88 Fed. Reg. 32914).

EPA states it's authority for the Supplemental Proposed Rule is provided in Clean Air Act (CAA) section 114. "As stated in the preamble to the Mandatory Reporting of Greenhouse Gases final rule (74 FR 56260, October 30, 2009) (hereinafter referred to as "2009 Final Rule"), CAA section 114(a)(1) provides the EPA broad authority to require the information proposed to be gathered by this rule because such data would inform and are relevant to the EPA's carrying out of a variety of CAA provisions." (88 Fed. Reg. 32857). We disagree. The reporting of energy consumption (indirect emissions) exceeds CAA section 114 which authorizes (in general) reporting for the purpose of developing standards of performance, any emission standard, or solid waste combustion for emission sources. EPA states that this information will improve their understanding of the energy intensity of specific facilities or sectors, and to better inform their understanding of the potential indirect GHG emissions associated with certain sectors. However, energy consumption (indirect emissions) is not the type of information authorized under CAA section 114. If EPA proceeds ahead with Subpart B as currently written, it must provide its specific Congressional authority to collect indirect energy consumption emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Leslie Bellas
Commenter Affiliation: American Fuels and Petrochemical Manufacturers (AFPM)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0323-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA proposes to require all facilities reporting under the GHGRR to submit data on energy consumption, *i.e.*, report "indirect emissions" associated with offsite production of electricity and thermal energy that is transmitted and used by a reporting facility.[3] Indirect emissions do not occur at the facility's location; rather, they physically occur at the facility (*e.g.*, a power plant) where the electricity or thermal energy is generated[4] The Proposal requires all reporting facilities to submit data on their annual purchases of electricity and thermal energy, along with "readily available" information, such as billing statements, the name of the provider, dates of service, meter locations, quantities purchased, billing period data, rate descriptors.[5] The stated purpose of the unprecedented requirement to report information regarding emissions generated offsite is to "gain an improved understanding of the energy intensity (*i.e.*, the amount of energy required to produce a given level of product or activity, both through onsite energy produced from fuel combustion and purchased energy) of specific facilities or sectors, and to better inform our understanding of energy needs and the potential indirect GHG emissions associated with certain sectors."[6] EPA's proposal exceeds its statutory authority, is redundant of information reported by electricity generators, and violates the Paperwork Reduction Act.

The Clean Air Act does not authorize EPA to collect information on indirect emissions. EPA's stated legal authority, Section 114(a)(1) of the Clean Air Act (CAA),[7] is inapplicable to the current Proposal to mandate reporting of energy consumption under the GHGRR. CAA Section 114(a) limits the Administrator's authority to collect information that could aid in the

development of potential regulatory requirements under CAA sections 110 (National Ambient Air Quality Standards), 111 (new and existing source performance standards), 112 (standards for hazardous pollutants), and 129 (solid waste combustion standards)[8] These specified programs regulate direct emissions from identified source categories. The GHGRR collects GHG emission data from forty-one large GHG emissions source categories (approximately 8,000 facilities) subject to new and existing source performance standards under CAA Section 111, standards for hazardous air pollutants under CAA Section 112, or solid waste combustion standards established under CAA Section 129. Until this proposal, EPA lawfully requested direct GHG emissions information from regulated source categories. The Proposal to collect "indirect" emissions data is not necessary to the development or implementation of standards under the source-specific programs cited in CAA section 114(a). EPA's proposal to limit data reporting to energy consumption that occurs on-site[9] does not remedy EPA's lack of authority. These emissions are not generated on-site and are not related to the source category reporting these emissions. Emissions associated with the production of electricity and thermal energy are largely reported as direct emissions under other GHGRR subparts. Therefore, EPA lacks regulatory authority to impose data reporting burdens that has regulatory purpose as set forth in CAA Section 114(a).

Footnotes

[3] 88 Fed. Reg. at 32,885.

[4] GHG Protocol, GHG Protocol Scope 2 Guidance: An Amendment to the GHG Protocol Corporate Standard (2015) at 25, https://ghgprotocol.org/sites/default/files/standards/Scope%202%20Guidance_Final_Sept26.pdf.

[5] 88 Fed. Reg. at 32,891.

[6] Id. at 32,885.

[7] Id. at 32,857.

[8] 42 U.S. Code § 7414(a).

[9] 88 Fed. Reg. at 32,885-886.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: L. Ritts
Commenter Affiliation: National Environmental Development Association's Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0331-A1
Comment Excerpt Number: 1

Comment Excerpt: As quoted in the introduction to these comments, the proposed rule defines "indirect emissions" as merely "an attribute" of activities that consume energy. EPA's authority to regulate an air pollutant does not extend to "an attribute of activities from a source of emissions," if the person who would be regulated by the proposed Part 98 regulations has no

control over the attribute, including the source of the energy and/or pollution control decisions over the source of those emissions.

However capacious the Act's definition of "air pollutant" may be, see Massachusetts v. Environmental Protection Agency, 549 U.S. 497, 504 (2007),[2] the EPA's authority to regulate an air pollutant is limited to pollutants emitted by sources that EPA has the authority to regulate. For example, EPA may regulate GHG emissions from stationary sources under Title I of the Act, including GHGs emitted by the various sources defined by CAA §§ 302(j), (x), and (z). Each definition underscores that it is based on air pollutants that a source "directly emits" and/or has "the potential to emit." Correspondingly, the Act places the responsibility to comply on the owners and operators of emission sources, because it is those persons that have the ability to control the emission, including funding decisions for pollution control. But EPA has no authority to impose obligations on the owner and operator of one source because of, or related to emissions from another source over which they have no control.

Footnotes

[2] The U.S. Supreme Court found in Massachusetts v. U.S. EPA, 549 U.S. 497, 529 (2007)., that EPA has statutory authority under the Clean Air Act's "capacious definition of 'air pollutant,'" to regulate emission of such gases from new motor vehicles. According to the Court, "That definition-- includes 'any air pollution agent ... including any physical, chemical, ... substance ... emitted into ... the ambient air ...,' § 7602(g) (emphasis added).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: L. Ritts
Commenter Affiliation: National Environmental Development Association's Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0331-A1
Comment Excerpt Number: 2

Comment Excerpt: As a basis for the proposed requirement for submitting energy usage data and records to the EPA, the NPRM's maintains that collection of Scope 2-related purchases will help the agency understand which industries are the most energy-intensive. The Notice also suggests that collection of such information will "inform future regulations."[3] This purported purpose for requiring submission of this business information is neither convincing nor relevant to the agency's statutory authority. Nor is the proposed collection of information on energy purchases under proposed Subpart B particularly useful for drawing conclusions or even making conjectures about the energy intensity of industries or plants or processes, at least beyond the data already available to EPA – and EPA does not explain how it would be.

It already is well-known that certain industries (*e.g.*, aluminum and steel smelting, cement) are far more energy-intensive than others, and indeed the Notice cites existing EIA and other federal agency analyses containing detailed information about this topic. See id. at 32,885/col. 3. Further, in the future, related information on indirect emissions may also be available to the

agency from regulated public corporations pursuant to proposed Security and Exchange Commission's "Environmental, Social, and Governance (ESG)" reporting requirements that are expected to be published in Fall 2023. EPA's fails to explain how collecting additional information under proposed Part 98 regarding purchase and usage data (including electric and thermal product metering records, energy bills, and power purchase agreements) would help the agency estimate GHG emissions from proposed Subpart B-affected sources or indeed from providers of electricity. The collection of data for data's sake is on its face arbitrary and capricious, and the cost to affected facilities of collecting this information would therefore be unreasonable, even if the EPA had the authority to collect it, which NEDA/CAP does not believe it has.

The records of purchased energy will say very little about the energy intensity of individual plants' manufacturing processes or products, and almost nothing about the GHGs emitted to produce the energy dispatched. The agency, itself, acknowledges in the Notice that energy intensity is independent from the energy attributes, 88 Fed. Reg at 32,891/col 2-3, and also casts doubt on the relationship between "indirect emissions" (*i.e.*, "attributes" of GHG emissions from others) and direct emissions of GHGs. In other words, EPA does not appear to expect that a plant's energy demands, much less that of a particular manufacturing process, is related to how much power is purchased and where the power is produced, or GHG emissions from the user or supplier of electricity. Thus, it seems clear to NEDA/CAP, that EPA knows that its goal to "gather information" on the energy intensity of various industrial manufacturing operations, for whatever future regulatory or policy purposes, is likely to not be advanced materially by information it now seeks, and therefore, on that basis the proposal is unreasonable.

NEDA/CAP agrees that there is little or no correlation between direct GHG emissions and "indirect emissions," or between energy use and the GHG emissions associated with the purchased energy (particularly when facilities purchase renewable energy through a variety of direct and indirect mechanisms). As NEDA/CAP and other commenters have explained in related EPA GHGRR rulemakings, manufacturing sectors, and even plants within a sector owned and operated by the same entity, cannot be meaningfully compared on the basis of energy intensity because of the variety of products, processes, and operating variables involved.[4] For, example, in batching industries, including chemicals and paper/film coating, the energy intensity of a single product depends on the number of intermediate steps, drying time, and length of a run. And between companies and even the plants owned by the same company, energy needs for manufacturing a product vary by many factors including but not limited to the location of the plant, the type of manufacturing equipment it operates, and the age of that equipment.

Energy use/purchases, GHG emissions, and product volumes can be very poorly correlated or not correlated at all. In times of economic stress or for volatile economic sectors, revenue (a potential measure of "activity") is likely very poorly correlated or uncorrelated to GHG emissions. Likewise, energy data alone would not indicate energy efficiency, and the data that would be required to indicate efficiency would be so diverse and voluminous as to render its collection untenable. Energy use is affected by myriad factors, per the U.S. Department of Energy: "Many variables can affect the monthly or even daily energy consumption of a facility. Examples of variables that can cause an increase or decrease in energy consumption include production level variability, product type variability, factors of production, weather, and feedstock/raw material quality. The specific variables depend on facility location, processes, and

outputs." Other factors include building size, geography, etc. See "Energy Intensity Baselining and Tracking Guidance…." ORNL/SPR-2020/1566.

The absence of an agency explanation in the NPRM rationally connecting the proposed reporting requirements to EPA's notably nebulous purposes for the information that would be collected (for example, how it could be used properly conduct energy intensity analyses across diverse U.S. industrial sectors or how such analyses might relate to attaining U.S. climate goals), as well as EPA's faulty presumption as to the practical value of energy intensity analyses as a comparative tool, leads us to predict that even if this proposed rule is finalized, it is unlikely to appease EPA's desire for a "comprehensive assessment" of the quantity of energy required to power various industries, or to lend itself to analyzing the energy intensity of particular industrial processes to produce information beyond that which is already available. Inevitably, then, it seems that perhaps after the agency tests out its legal authority for acquiring such information, the EPA intends demand yet more information, in order to eventually propose additional regulations that are intended to impose best energy intensity practices for manufacturing.

In that circumstance, NEDA/CAP asserts that EPA would be required to initiate a new rulemaking to discuss the statutory authority it has for collecting information on energy intensity, articulating how the information it wishes to collect from manufacturers relates to the purpose for collecting it, and to the extent that such purpose is to imposed substantive requirements on an energy-users apart from those users' direct emissions, the statutory authority for such a scheme. NEDA/CAP submits that the agency has no statutory authority to study (through section 114 mechanisms), or to regulate, the energy intensity of industrial processes, even if they were comparable, which they are not. Such regulatory initiatives would not be authorized by the Clean Air Act. They also would be an unreasonable intrusion on U.S. manufacturing and innovation.

Footnotes

[3] "EPA is proposing to add a new subpart—subpart B (Energy Consumption)—to improve the completeness of the data collected under the GHGRP, add to the EPA's understanding of GHG data, and to better inform future EPA policy under the CAA, such as informing potential future EPA actions with respect to GHGs." 88 Fed. Reg. 32,885/col.1-2.

[4] For instance, in industries that typically "batch" production based on orders and can therefore be idle for period of time for clean-up or for prepping a new product or intermediate, electricity or steam purchases are dependent on the nature of each product or intermediate. Thus, the data that EPA would collect, if the proposal is finalized, would likely not advance energy-intensity analyses and potentially be confusing depending on changes in product lines that vary during a year, and in some industries like the automotive industry, year-by-year. Also, the information collected would be dated in the sense that both energy and manufacturing process needs are heavily dependent on markets, prices, and supply that vary, sometimes appreciably, over time.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: L. Ritts
Commenter Affiliation: National Environmental Development Association's Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association

Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0331-A1
Comment Excerpt Number: 4

Comment Excerpt: Prompted by prior comments questioning the agency's authority under the Act to utilize Section 114 of the Clean Air Act regarding GHG reporting, the NPRM recites that Section 114(a)(1) provides the agency broad authority to "require the submission of this information from any person who (1) owns or operates an emission source, (2) manufactures control or process equipment, (3) the EPA believes may have information necessary for the purposes set forth in Section 114(a), or (4) is subject to any requirement of the Act (except for manufacturers subject to certain title II requirements who are subject to CAA section 208) (emphasis added). The EPA may require this information for the purposes of developing or assisting in the development of any implementation plan, an emission standard under sections 111, 112 or 129, determining if any person is in violation of any such standard or any requirement of an implementation plan, or 'carrying out any provision' of the Act." See NPRM at 32,887/col. 1.

NEDA/CAP believes that however broad EPA's authority is to collect information regarding the purposes set forth in CAA Section 114, this authority is not unlimited because the requirements of the Act are not unlimited. For instance, there is no requirement in the CAA for a regulated source of emissions to provide information to the agency on "attributes" of emissions from sources not under its control. Such information is neither related to the development of any Clean Air Act implementation plan nor to a CAA standard, much less a violation of any such standard or implementation plan.[6]

Nor is the energy efficiency pathway down which the agency seeks to tread is not authorized by the Act. Section 114 simply does not provide unlimited authority to EPA to mine information from one source about another source's GHG emissions, much less collecting information to gauge the energy intensity of a manufacturing process. Likewise, NEDA/CAP believes that the EPA lacks the authority to require information from an electric utility on a power purchase agreement (PPA) with an industrial customer, even if one or the other must report GHG emissions or either operates a facility that is regulated by the CAA for some other purpose(s). The Clean Air Act does not regulate PPAs or provide any authority to EPA to regulate them. Also, as we have explained, the substance of a PPA is marginally related to the GHGs that an EGU emits, and they would have no bearing on the GHGs that its customer emits and/or that the customer is obligated to report. Furthermore, neither the PPA nor the metering and billing data have any relationship to "carrying out any provision" of the Clean Air Act.

Likewise, even if the person who owns or operates an industrial source must report the source's emissions under the GHGRR to EPA, EPA's authority to request information under CAA § 114 is similarly bounded by carrying out the Act's provisions with reference to that source—in other words, it does not extend to non-emission "attributes of energy" released into the atmosphere by another "source" and particularly not one over which the recipient of the request has no control (even if it could identify that electric company, the type of fuel, or how it is operated. In the Notice, however, EPA seems to expansively argue it has much broader authority to collect information to carry out "any provision of the Act," which we assume means a more comprehensive understanding of climate change. Just because EPA may have authority to study

climate change or has authority over another owner/operator of a separate source that provides energy for sale to a manufacturer, does not mean that purchase of electricity "is subject to any provision requirement of the Act." Electricity purchases are subject to many local, state, and regional entities, not to mention the Federal Energy Regulatory Commission and the Department of Energy, not to the EPA. Also, it is not clear how energy purchases are directly related to climate change.

EPA also appears to argue expansively that Congress authorized the agency to collect any emissions information from any GHG source regardless of whether the recipient of the information collection request/regulation actually emits the GHGs about which EPA is seeking information. Not unlike the situation under the Clean Power Plan in which EPA asserted its authority regulate how energy is dispatched on the basis of its climate impacts, the Agency appears to be asserting that it has the authority to obtain GHG emissions-related data from sources outside the regulated source's control. In that respect, NEDA/CAP respectfully advises that the Supreme Court has ruled with respect to several provisions of the first Clean Power Plan that EPA lacks such authority to regulate sources outside the fence line of a facility. *West Virginia v. EPA, 597 U.S.___, 2022 Lexus 3268 (2022)*. The fact that the proposal targets sources that belong to one of the forty-one industry categories that already must report their GHG emissions under Part 98, like CAA Section 111(d), do not provide a sufficient basis for expanding EPA's authority to collect information from such manufacturers about attributes of its energy purchases from other regulated sources, for purposes of understanding the energy intensity of industries or for purposes of future regulation of manufacturing based on its energy-use intensity even if the proposed action was reasonable, which it is not.

Footnotes

[6] The only exception may be for air quality analyses required to determine whether a NAAQS exceedance could occur if a proposed source of regulated air pollutants were to be built.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council (ACC) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0325-A1
Comment Excerpt Number: 5

Comment Excerpt: Section 114 provides EPA with authority, in appropriate cases, to require collection, creation, retention, and reporting of records; require monitoring and sampling; enter premises where records are kept and inspect such records and equipment; and require regulated entities to "provide such other information as the Administrator may reasonably require" for a finite set of purposes, including: [6]

(i) "developing or assisting in the development of any implementation plan under section 7410 or section 7411(d) of this title, any standard of performance under section 7411 of this title, any

emission standard under section 7412 of this title … or any regulation of solid waste combustion under section 7429 of this title, or any regulation under section 7429 of this title (relating to solid waste combustion),"
(ii) "determining whether any person is in violation of any such standard or any requirement of such a plan, or"
(iii) "carrying out any provision of this chapter …"[7]

The statute's enumeration of specific programs covered by section 114 in paragraph (a)(1)(i) is notable, as is the statute's qualifier "other information as the Administrator may reasonably require" in delineating the reasonable limits of its 114 authority in the instant case.[8]

EPA's rationale for imposing the Subtitle B requirements does not meet that minimum standard. Rather, it appears to hinge on the presumption that section 114 allows the Agency to ask for anything it deems may be relevant to any potential future policy exercise, stated or unstated:

"Given the broad scope of CAA section 114, it is appropriate for the EPA to collect information on purchased energy because such information is relevant to the EPA's ability to carry out a wide variety of CAA provisions."

"Relevant to … a wide variety of CAA provisions" cannot be the threshold standard for demanding sweeping and intrusive new recordkeeping and reporting requirements, let alone the imposing new mandates and standards for equipment needed for compliance with the proposal. Even assuming it was enough, EPA's relevance claim is thin, given the narrow scope of EPA's regulatory authority with respect to energy markets and product-level energy attributes. Prior to exercising authority under 114 EPA must indicate which provisions addressing GHGs it believes that the information it seeks to collect is relevant to and how such information would be needed to facilitate action under those provisions. In providing such explanation, EPA must take into account the statutory authority under those provisions. For example, EPA would lack authority to solicit this information for purposes of implementing a program that transforms the energy section under section 111(d).[9] General assertions of authority are not sufficient.

Nothing in the 2009 Omnibus Act spoke to the energy intensity of products or activities, nor do other core regulatory mandates and standards under EPA's remit (National Ambient Air Quality Standards, Best Available Control Technology, Lowest Available Emission Reduction, Best System of Emission Reduction, Best available Reduction Technology, National Emission Standard for Hazardous Air Pollutants, etc.), and to the extent energy use and product intensity information might be indirectly related to implementing these programs, it would be addressed at the state, regional, state or tribal level where most energy market policy resides, or with other agencies like the Department of Energy, the Federal Energy Regulatory Commission, or the Energy Information Agency.

The presumption that EPA might be better at handling energy information and policy is no justification, though EPA hints at it here when it expresses dissatisfaction with the information provided by the federal Manufacturing and Energy Consumption Survey (MECS) published by the DOE Energy Information Administration (EIA).

"[W]hile U.S. Energy Information Administration data show that industrial U.S. electric power usage declined from 1,372 megawatt-hour (MWh) per customer in 2007 to 1,188 MWh per

customer in 2019, the EPA is unable to determine how individual industrial sectors contributed to the decreased electric power usage and is therefore unable to identify best practices in use."[10]

If EPA's concern is that the information collected by EIA (the agency tasked with collecting industrial energy use and consumption) is inadequate, the solution is to revise EIA's information collection activities through its existing program or a Congressionally approved expansion, not to use this alleged deficiency as a pretext to push EIA aside. EPA's 114 authority is not a blank check to assume the duties of other agencies, particularly where the stated use of the information skirts perilously close to an end-run around other statutorily authorized programs it deemed wanting.

EPA's explanation on the inadequacies of EIA's information collection also suggests that EPA may be looking to how to directly impact the operation of the electric sector. The Supreme Court spoke to this general form of regulatory overreach less than 13 months ago in the landmark Clean Air Act case, West Virginia v. EPA.

"On EPA's view of Section 111(d), [that] Congress implicitly tasked it, and it alone, with balancing the many vital considerations of national policy implicated in deciding how Americans will get their energy […], There is little reason to think Congress assigned such decisions to the Agency. For one thing, as EPA itself admitted when requesting special funding, "Understand[ing] and project[ing] system-wide … trends in areas such as electricity transmission, distribution, and storage" requires "technical and policy expertise not traditionally needed in EPA regulatory development."[11]

The Court's concerns would apply equally here. There is little reason to think that Congress assigned regulation of energy use in product or product intensity to EPA when multiple other agencies already do so, and there is neither precedent nor textual support for this interpretation.

To the extent that EPA believes that understanding how companies can change their feedstocks, offsite energy consumption practices, energy sources, or procurement methods is authorized under 114, it is misguided. Neither the authority granted under the original 2008 Consolidated Appropriations Act nor sections 111, 112, or 129 of the Clean Air Act make Subtitle B information a "reasonable requirement" to implement a statutorily authorized program, nor has EPA provided any such explanation for how such information is needed to address reduction in GHG emissions under any of those sections.. To the extent the information sought under Subpart B is indeed required, it is available or should be sought elsewhere under separate statutory authority.

Footnotes

[6] 42 U.S.C. §7414 (a)(1).

[7] Id. (internal citations omitted)

[8] Id.

[9] W. Vir. v. EPA (U.S. 2022), 28-29; Gorsuch concurrence at 15.

[10] Proposed Rule at 32886-32887 (citing EIA, 2018 Manufacturing and Energy Consumption Survey, #MECS2018 (Dec. 2021) (internal citations omitted).

[11] WV. V EPA at 25 (internal citations omitted).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 2

Comment Excerpt: Last year, EPA requested comment on whether the Agency should expand the GHGRP to require reporting of a source's onsite energy consumption. EPA's proposal stated that "facilities that are subject to the [rule] would be required to submit new, summary data elements quantifying their consumption of purchased energy products and characterizing associated markets and products (*e.g.*, regulated or deregulated electricity markets and renewables attributes of purchased products)." 87 Fed. Reg. at 37,018. EPA noted that it would not require quantification of indirect emissions, nor would these indirect emissions count towards GHGRP applicability for facilities. However, EPA took comment on whether the Agency should estimate indirect emissions using purchased energy data. Id. In the Supplemental Proposal, EPA moves forward with adding new requirements for sources to report energy consumption data, including certain electricity purchases.[10] However, EPA is not proposing to require estimation of any associated indirect emissions, nor has EPA asserted that it will use such data to make such estimates without first undertaking a separate rulemaking. See id. at 32,887 and 32,888.[11]

It is appropriate that EPA has not moved to require quantification of indirect emissions, which are outside of EPA's regulatory authority,[12] but EPA has not solved its statutory problems by limiting the Supplemental Proposal to energy consumption data. EPA attempts to address several concerns that were raised in response to last year's request for information about the collection of energy consumption data, particularly comments that focused on EPA's limited statutory authority to require collection of such data, by asserting an unspecified "policy" interest in this data as it may be related to future regulations and the ability to regulate energy intensity, but these are unavailing. EPA cannot collect data for unspecified purposes untethered from its regulatory authority and EPA lacks statutory authority to regulate energy intensity. EPA regulates direct emissions, and its data collection authority must serve these purposes.[13] While energy consumption data might be useful to broader federal efforts to address climate change, this does not mean that EPA has unfettered authority to collect it and EPA cannot point to any provision of the CAA that supports the authority to do so that the Agency asserts in the Supplemental Proposal. However, if EPA decided to move forward with proposals to regulate direct emissions from specific a source category or type of affected sources, the Agency could collect needed data if it could show how such data was relevant to the establishment of emissions standards and limitations. Accordingly, EPA should not finalize the proposal to collect energy consumption data under the GHGRP.

Footnotes

[10] See 88 Fed. Reg. at 32,869 and 32,885-92.

[11] A separate rulemaking is beside the point, however. As discussed herein, EPA does not have the authority to regulate indirect emissions.

[12] Also, as discussed extensively in EEI's comments in response to last year's proposal, would result in yet another conflicting regime for scope 2 emissions estimations.

[13] Indeed, with the exception of EGUs and the oil and gas production, transport, storage, and processing sectors, EPA has not proposed direct GHG emissions limitations for any source category. Moreover, EPA has ignored settlement agreements to move forward with such regulations in other sectors. Instead of focusing on data collection to serve speculative future efforts to possibly regulate these sources' energy consumption, EPA should consider directly regulating GHG emissions from these sources emitting sources first. Such regulations are squarely within EPA's authority, and while some sectors' indirect emissions from energy consumption might be greater than direct emissions, there are many unregulated source categories with significant direct emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 1

Comment Excerpt: Although the Associations agree with EPA's decision to not move forward with requiring quantification of indirect emissions, which are outside of EPA's regulatory authority,[16] EPA has not fully resolved the concerns raised over the scope of its statutory authority by limiting the Supplemental Proposal to energy consumption data. In its Supplemental Proposal, EPA attempts to address several concerns raised in response to its 2022 request for information about the collection of energy consumption data, particularly comments that focused on EPA's limited statutory authority to require collection of such data, by asserting an unspecified "policy" interest in this data as it may related to future regulations and the ability to regulate energy intensity. These attempts are unavailing. Congress has not authorized EPA to collect data for unspecified purposes untethered from its regulatory authority. EPA regulates direct emissions, not energy intensity, and its data collection authority must serve these purposes.[17]

Footnotes

[16] Additionally, implementation of such a requirement would result in yet another conflicting regime for scope 2 emissions estimations.

[17] Indeed, with the exception of EGUs and the oil and gas production, transport, storage, and processing sectors, EPA has not proposed direct GHG emissions limitations for any source category. Moreover, EPA has ignored settlement agreements to move forward with such regulations in other sectors. Instead of focusing on data collection to serve speculative future efforts to possibly regulate these sources' energy consumption, EPA should consider directly regulating GHG emissions from these emitting sources first. Such regulations are squarely within EPA's authority, and while some

sectors' indirect emissions from energy consumption might be greater than direct emissions, there are many unregulated source categories with significant direct emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 2

Comment Excerpt: While energy consumption data might be useful to broader federal efforts to address climate change, this does not mean that EPA has unfettered authority to collect such information. EPA cannot point to any provision of the CAA that provides the statutory authority to collect broad energy consumption data. However, if EPA decided to move forward with proposals to regulate direct emissions from a specific source category or type of affected sources, the Agency could collect needed data if it could show how such data was relevant to the establishment of emissions standards and limitations. Accordingly, the Associations strongly urge EPA to not finalize the proposal to collect energy consumption data under the GHGRP.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 3

Comment Excerpt: In response to last year's proposal, EEI submitted comments questioning EPA's authority under the Clean Air Act (CAA) to collect either energy consumption or indirect emissions data. EPA's response to these comments, included in this Supplemental Proposal, do not overcome the concerns raised previously. CAA Section 114 is clearly tied to EPA's authority to regulate direct emissions from source categories or affected sources and is not a broad grant of authority to explore indirect emissions or require reporting of data that is not related to emissions. EPA's assertion of the need for this data for unspecified "policy" purposes ignores both the fact that EPA is a regulator, not a policymaker, as well as the limitations that the Act places on EPA's regulatory authority.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA lacks authority to collect the information it seeks under the proposed Subpart B. EPA has proposed to add a new Subpart B to the GHGRP that would require reporting entities to provide information on their energy consumption, effectively requiring the reporting of Scope 2 data for covered sources. This proposed requirement exceeds EPA's legal authority under the Clean Air Act ("CAA"). Even if EPA could impose such a requirement, the Proposed Rule does not provide a reasonable justification for mandating the reporting of energy consumption or Scope 2 data. Section 114 of the CAA allows EPA to request information for the purpose of developing new air regulatory requirements, for determining whether a person is in violation of EPA rules, or for carrying out any other provision of chapter I of the CAA.[1] EPA has not established that its proposed Subpart B would fulfill any of these statutory purposes. As such the proposal is arbitrary and capricious and contrary to law.

As an initial matter, section 114 does not authorize EPA to require reporting for the vast majority of the economy without a clear regulatory or enforcement purpose. In the preamble, EPA says that it is appropriate to require the submission of energy consumption information because "direct GHG emissions do not enable a comprehensive assessment of the quantity of energy required to operate the facility because industrial operations can consume a significant amount of energy for which direct GHG emissions do not occur at the production site, primarily through purchased electricity and thermal energy products.[2] EPA goes on to state that it "is interested in collecting data on energy consumption to gain an improved understanding of the energy intensity (*i.e.*, the amount of energy required to produce a given level of product or activity, both through onsite energy produced from fuel combustion and purchased energy) of specific facilities or sectors, and to better inform our understanding of energy needs and the potential indirect GHG emissions associated with certain sectors."[3] This information, EPA asserts "would also allow the EPA to identify industry-specific best operating practices for increasing energy efficiency and reducing GHG emissions, and to evaluate options for expanding the use of these best practices or other potential policy options."[4] Further, EPA asserts that energy consumption information might be useful in identifying the most energy efficient facilities in each sector and that EPA will be able "to complete facility-level, energy efficiency comparisons within discrete sectors."[5]

Although EPA may find this information interesting, it has not identified any policy option or regulatory action that it is considering. EPA cannot reasonably invoke the first prong of the section 114 statutory justifications for requesting information unless it explains a specific regulatory action that the agency plans to develop using the information collected.

Without an existing regulatory requirement related to Scope 2 emissions or combustion information, there likewise cannot be any potential violation that EPA is seeking to investigate.

Accordingly, the second possible statutory justification for an information request under section 114 does not apply.

That leaves EPA with the third prong of section 114 authorization, which EPA cites as the basis for this rulemaking: information related to carrying out any of chapter of the CAA.[6] Indeed, EPA asserts that Scope 2/energy consumption information "is relevant to the EPA's ability to carry out a wide variety of CAA provisions."[7] Further, EPA says it may develop regulatory or non-regulatory policies to address GHG emissions[8] These generalized assertions as to how the information might be used at some indeterminate time in the future are not adequate justifications for an information request of the size, scope, and duration that EPA has proposed.

First, EPA has a fundamental obligation to assert a rational basis for implementing its authority under section 114. In this case, which requires a particularized explanation of the reasons EPA actually, currently needs this information, even when EPA involves the "carrying out any provision of this chapter" provision of section 114. Without a more concrete explanation for why this information is needed, EPA cannot impose these reporting requirements.

Further, section 114 only authorizes EPA to collect information "as the Administrator may reasonably require.[9] Without a clear plan to regulate Scope 2 emissions or to use energy consumption information to develop a regulatory requirement and with no specific statutory authority identified to support such a rulemaking, EPA's proposed Subpart B requirements are not reasonable.

Footnotes

[1]42 U.S.C. § 7414(a).

[2]88 Fed. Reg. 32,852, 32,885 (May 22, 2023).

[3]*Id*.

[4]*Id*.

[5]*Id*. at 32,887-88.

[6]*See id*. at 32,886.

[7]*Id*.

[8]*Id*.

[9]42 U.S.C. § 7414(a)(1)(G) (emphasis added).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 5

Comment Excerpt: The GHGRR was authorized by the Consolidated Appropriations Act, 2008, PL 110- 161, 121, State. 1844, 2128. and the 2009 Appropriations Act (Consolidated Appropriations Act, 2009, Pub. L. 110-329, 122 Stat. 3574-3716). The law specified mandatory reporting of greenhouse gas emissions above appropriate thresholds in all sectors of the economy of the United States. We do not think EPA has the authority to collect energy consumption emissions from all reporters. In addition, if EPA proceeds ahead with this requirement, it must provide its Congressional authority and how it will avoid duplication of data.

We request EPA provide detailed justification as to how the collection of energy consumption data from all reporters is consistent with the Consolidated Appropriations Act, 2008, PL 110-161, 121, State. 1844, 2128. and the 2009 Appropriations Act (Consolidated Appropriations Act, 2009, Pub. L. 110-329, 122 Stat. 3574-3716), justify the need for this information and how EPA will avoid duplication of information.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 9

Comment Excerpt: The legislative basis that the agency is relying upon to justify its expansion of GHG reporting to include indirect emissions is unfounded. The agency refers (on page 37018) to the 2008 Consolidated Appropriations Act. The language there merely directs the EPA to develop and publish a rule "to require mandatory reporting of greenhouse gas emissions above appropriate thresholds in all sectors of the economy of the United States." If the agency is already receiving emissions data on 85-90% of the America's GHG emissions, the only potential gap in relation to the 2008 Consolidated Appropriations Act language is with respect to the remaining 10-15%, which the agency can attempt to address through considering potential additional requirements (to the extent that such requirements would be justified and reasonable, without imposing undue costs) for reporting of direct emissions, consistent with the current regulatory framework focused on such emissions. The gap in achievement does not require reporting of indirect emissions; in fact, that would duplicate current reporting of the direct emissions of the power sector, as stated above, and there is no practical utility for reporting indirect emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council (ACC) et al.
Commenter Type: Industry Trade Association

Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0325-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA lacks the statutory authority to impose the sweeping information collection, analysis, and reporting mandates proposed under Subpart B, governing "Energy Consumption."

This new Subpart would require reporters, among other things, to develop, maintain, and report or provide access to 1) a detailed new Metered Energy Monitoring Plan (MEMP); 2) detailed descriptions, data, and photos of energy-related operations and facility design associated with every energy meter; 3) information on energy metering equipment, down to the manufacturer and model number; 4) staffing and management information associated with energy procurement and consumption; 5) energy procurement information for each provider, including billing frequency, billing documentation; and 5) data quality and validation methods and procedures. It would set federal standards for energy meter use and require facilities to certify or obtain certifications from suppliers on the conformity of each meter with the new federal standards, along with supplier correspondence, photographs, technical data, and descriptions of procedures used. These requirements extend far beyond EPA's congressional mandate under any of its current statutory authorities and well into the jurisdiction of other federal, regional, and state agencies tasked with overseeing the nation's complex energy system.

EPA would impose these new requirements under the aegis of the Greenhouse Gas Reporting Program, established pursuant to a brief appropriation line item in the 2007 Consolidated Appropriations Act. This obscure provision provided funds for the development of a rule "to require mandatory reporting of greenhouse gas emissions above appropriate thresholds in all sectors of the economy of the United States."[3]

When EPA built out its current GHGRP program in 2009, it appropriately focused on the direct (scope 1) emissions associated with each regulated facility in accordance with specific rules for each stationary source subcategory, including both energy providers and industrial users.[4] 14 years later, EPA argues that it needs to expand its GHGRP requirements significantly to address various aspects of a regulated entity's "energy consumption. To obtain that information, EPA sidesteps the limited 2008 appropriations bill authority establishing the GHGRP program, instead asserting broad data collection authority under section 114 of the Clean Air Act.[5] This assertion lacks merit.

Footnotes

[3] Public Law No: 110-161 (Dec. 17, 2007).

[4] EPA acknowledges that it considered including scope 2 emissions reporting in 2009 but decided against it. GHGRP Proposal at 32886. 32886.[5] Id. at 32857.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Joseph Donovan
Commenter Affiliation: Transformer Manufacturing Association of America (TMAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0294-A1
Comment Excerpt Number: 1

Comment Excerpt: In the NOPR, for the very first time, the EPA finds that it has the authority and jurisdiction to require certain manufacturers, including transformer manufacturers producing equipment under NAICS Code 33531, to: (i) report annually a myriad of extensive energy consumption data related to every qualifying facility the reporting entity operates and (ii) maintain all related billing, certification and maintenance records for an undefined period of time. See NOPR at 32885-88, 32926. The NOPR imposes a burdensome reporting mandate for all energy consumption at these manufacturing facilities pursuant to the newly-proposed Subpart B to Part 98 of the EPA regulations. See id. at 32923-26.[1]

Under this proposal, all entities subject to the current part 98 emission reporting requirements (more than 40 different categories of entities based on NAICS code) now must undergo additional extensive tracking, reporting and recordkeeping obligations related to its energy consumption data. To the TMAA's knowledge, this proposal is the first time the EPA has determined it has the authority from Congress to expand its greenhouse gas reporting requirements to include energy consumption data, as opposed to emission data. As the NOPR notes, the EPA considered doing so in its 2009 rulemaking process but declined to make that finding. Id. at 32886. This reversal is a hugely impactful change in policy that exposes a large portion of the economy to a new and burdensome regulatory reporting scheme.

As the sole basis for this newly found authority that will impact a significant portion of the American economy, the EPA relies upon a finding that not granting itself the authority to require this energy consumption reporting would preclude it from "carrying out any provision of the [Clean Air] Act." Id. at 32887. The NOPR does not, indeed cannot, point to a single clear statement in the Clean Air Act in which Congress has conferred on the EPA the authority and jurisdiction to impose these energy consumption reporting and recordkeeping requirements.

The NOPR's backdoor assertion of jurisdiction to require energy consumption reporting and recordkeeping obligations under the Act is outside the EPA's statutory authority. Notably, the NOPR does not reference or consider the Supreme Court's analysis of EPA authority as detailed in West Virginia v. U.S. Environmental Protection Agency, 142 S. Ct. 2587 (2022) ("West Virginia"), in which the Supreme Court clarified the role of the EPA versus Congress in granting authority to an agency. The West Virginia Court made clear that:

"Extraordinary grants of regulatory authority are rarely accomplished through 'modest words,' 'vague terms' or 'subtle device[s].' [citing Whitman v. American Trucking Assns., Inc., 531 U. S. 457, 468 (2001)] Nor does Congress typically use oblique or elliptical language to empower an agency to make a 'radical or fundamental change' to a statutory scheme. MCI Telecommunications Corp. v. American Telephone & Telegraph Co., 512 U. S. 218, 229 (1994). Agencies have only those powers given to them by Congress, and "enabling legislation" is generally not an "open book to which the agency [may] add pages and change the plot line." E. Gellhorn & P. Verkuil, Controlling Chevron-Based Delegations, 20 Cardozo L. Rev. 989, 1011

(1999). We presume that "Congress intends to make major policy decisions itself, not leave those decisions to agencies." United States Telecom Assn. v. FCC, 855 F. 3d 381, 419 (CADC 2017) (Kavanaugh, J., dissenting from denial of rehearing en banc).

Thus, in certain extraordinary cases, both separation of powers principles and a practical understanding of legislative intent make us "reluctant to read into ambiguous statutory text" the delegation claimed to be lurking there. [Utility Air Regulatory Group v. EPA, 573 U. S. 302, 324 (2014). To convince us otherwise, something more than a merely plausible textual basis for the agency action is necessary. The agency instead must point to "clear congressional authorization" for the power it claims. Ibid.

West Virginia, 142 S. Ct. at 2609 (emphasis added).

The NOPR's passive, backdoor assertion of jurisdiction in which it claims that not granting itself the authority to require this energy consumption reporting would preclude it from "carrying out any provision of the [Clean Air] Act." does not pass muster. The EPA "must point to clear congressional authorization for the power it claims" to require manufacturers to track, report and maintain recordkeeping on its energy consumption. It cannot do so. Notably absent in the NOPR is any assessment of how the assertion of authority is consistent with the Supreme Court's ruling in West Virginia v. EPA.

Footnotes

[1]While the NOPR does not provide a specific definition of energy consumption, the proposed new Rule 98.26 lists the extensive types of information and data required to be included in the annual reporting and recordkeeping processes for every reporting facility. This data includes meter type, number and location; affirmation the meter is ANSI compliant; energy delivery provider name and identifying number; payment address; GHGRP facility identifier of the energy supply service provider; electricity service provider name; billing information and start and end dates for each billing period; quantities purchased from both electricity and thermal energy suppliers; rate/tariff descriptors for each facility; copies of billing statements; etc.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 30

Comment Excerpt: The primary purposes of this proposed rule are to streamline implementation, make minor changes, clarify confusing provisions, and to improve the overall quality and consistency of the data reported under the GHGRP. This aspect of the proposed rule would not achieve any of those goals. It would represent an extraordinary broadening of the GHGRP. It could also result in significant double-counting of emissions. Undoubtedly, the vast majority of GHG emissions associated with power generation are already accounted for under

EPA rules. That information is supplied directly by power producer, who have access to the best information available to characterize GHG emissions associated with such power. Asking power consumers to report that same information will result in unnecessary duplication of efforts and poorer quality information overall. Further, the purpose of any information collection under section 114 of the CAA is for the development or implementation of regulatory requirements. EPA does not have authority to regulate energy consumption, so there is no appropriate purpose for collecting the information addressed in this element of the proposed rule. This information is also very hard to track down. In most cases, facilities receive an electricity bill, similar to what you receive for your home. It does not include information on regulated or de-regulated electricity markets and renewable attributes of purchased products. For this request to work, electricity suppliers would need to provide this information in a clear manner to their customers. Right now, that is not the case, and there is presently no obligation upon those providers to do so. Operators simply do not have access to this information. EPA suggests that this information could be used to support the development of voluntary programs. Under those circumstances, EPA could consider providing for a voluntary purchased power reporting program. Such a program would require significant additional consideration and would not appropriately be included in the GHGRP.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0293-A1
Comment Excerpt Number: 1

Comment Excerpt: Section 114 of the Clean Air Act does not authorize EPA to collect purchased energy data. In proposed new Subpart B, EPA would require companies to report data related to purchased energy. This data would relate not to emissions directly released by the reporting entity, but rather to emissions released offsite by a different entity, *i.e.*, Scope 2 emissions. EPA states that it seeks such data in order "to improve the completeness of the data collected under the GHGRP, add to the EPA's understanding of GHG data, and to better inform future EPA policy under the CAA, such as informing potential future EPA actions with respect to GHGs."[2]

We do not believe that this proposed requirement is authorized by the Clean Air Act. Recent Supreme Court case law emphasizes the importance of ensuring that agency actions and requirements have been authorized by Congress.[3] Here, EPA claims that its authority to impose additional reporting burdens under Subpart B lies in Section 114 of the Act. However, the grant of authority to EPA to require reporting from regulated companies in that section is limited and generally pertains to reporting that would enable EPA to develop standards of performance and emission standards or to determine whether violations of those standards have occurred.[4] Those standards would necessarily focus on, and be imposed upon, facilities directly releasing the emissions being regulated – not on offsite emissions produced by a different entity. The focus of

the GHG reporting program heretofore has been limited to collection of data regarding emissions directly released by facilities that are susceptible to regulation, not data related to the expanded category of indirect emissions now being contemplated by EPA. Limiting data collection efforts to emissions directly released by the reporting party is appropriate given that Section 114 limits EPA's ability to require reporting to such information as is pertinent to the development of requirements applicable to sources directly emitting the pollutant in question. Collecting data related to indirect emissions created by different entities at different facilities does not aid EPA in carrying out its responsibilities under Section 114. Therefore, we believe that EPA lacks authority under the Clean Air Act to impose data reporting burdens pertaining to purchased energy and offsite emissions as contemplated in the Subpart B proposal.

Footnotes

[1]88 Fed. Reg. 32852 (May 22, 2023).

[2]*Id*. at 32885.

[3]*See, e.g.*, *West Virginia v. EPA*, No. 20-1530 (June 30, 2022).

[4]*See* 42 USC § 7414(a).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 15

Comment Excerpt: Whether the Agency uses the reported energy consumption data for comparing facility and sector energy intensities or for estimating indirect emissions, both applications of the data would be used for the purpose of "developing or assisting in the development of any implementation plan, an emission standard under sections 111, 112 or 129, determining if any person is in violation of any such standard or any requirement of an implementation plan, or 'carrying out any provision' of the Act." the Clean Air Act directs the EPA to use this data to regulate emissions at their source. Emissions from purchased power do not generally occur from the facilities that consume them. If the EPA is using energy consumption data to reduce facility and sector energy intensities, it would have to regulate the upstream energy generating units to achieve this. This would be a "beyond the fence line" approach to regulating sources, which was a methodology recently employed by the 2015 Clean Power Plan and subsequently rejected in the 2022 Supreme Court decision, West Virginia v. EPA.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Stephanie Engwall
Commenter Affiliation: Atmos Energy Corporation
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0328-A1
Comment Excerpt Number: 4

Comment Excerpt: Requiring natural gas distribution and onshore natural gas transmission pipelines to report purchased energy is outside the purview of Section 114 because the requirement does not gather emissions information. EPA has authority to require entities to report information pertinent to the development of obligations applicable to the sources emitting the pollutant in question.[8] The emissions associated with the energy purchased by Atmos Energy are best known and reported by the facilitie(s) that emit them—not Atmos Energy.

Footnotes

[8] See 42 U.S.C. § 7414(a).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0311-A1
Comment Excerpt Number: 1

Comment Excerpt: In EPA's Supplemental Notice of Proposed Rulemaking, the Agency indicates an interest in "collecting data on energy consumption to gain an improved understanding of the energy intensity" through expanding the source categories and requirements included within Subpart B. With the expanded source category definition, Subpart I reporting facilities would now likely meet the definition of a Subpart B source. SIA does not support the inclusion of Subpart I and Subpart C reporters within Subpart B. Based on 40 CFR Part 98.1 Purpose and Scope, the Mandatory Greenhouse Gas Reporting rule "establishes mandatory greenhouse gas (GHG) reporting requirements for owners and operators of certain facilities that directly emit GHG…" and therefore tracking Scope 2 electricity use of Subpart I and Subpart C reporters is outside the scope of the rule. SIA believes the MRR should focus on direct emissions and not expand to include energy consumption and Scope 2 emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association

Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 5

Comment Excerpt: Efficient use of fuel consumption can be a strategy to reduce a facility's direct emissions. For example, EPA has considered designs that use fuel efficiently as an emissions reductions system that can form the basis of emissions limitations for sources and source categories, particularly when "bolt on" control technologies are not available or prohibitively expensive, making reductions in fuel consumption per unit of output the best method for reducing emissions rates.[17] However, while EPA can consider the efficiency of an emitting unit as part of an emissions limitation or standard to address direct emissions from fuel consumption, EPA has outlined a much broader authority in the Supplemental Proposal: to regulate efficiency even when it does not have any impact on direct emissions or any relationship to emissions at all—as the consumption of electricity onsite or by any emitting facility does not result in any direct emissions.[18]

Focusing on total energy consumption instead of on emissions would represent a significant expansion of EPA's regulatory authority under the CAA, but EPA does not address the statutory basis for this in the Supplemental Proposal. Moreover, EPA does not address how its regulation of energy consumption is consistent with other, existing federal regimes, which vest such authority in the Department of Energy (DOE).

In summary, the Energy Policy and Conservation Act (EPCA) was enacted in 1975. EPCA was amended in 1979 and directed the DOE to establish energy conservation standards for consumer products. The National Appliance Energy Conservation Act of 1987 established minimum efficiency standards for many common household appliances. Congress set initial federal energy efficiency standards and established schedules for DOE to review and update these standards. The Energy Policy Act of 1992 (EPAct) added standards for some fluorescent and incandescent reflector lamps, plumbing products, electric motors, commercial water heaters, and heating, ventilation, and air conditioning (HVAC) systems. EPAct also allowed for the future development of standards for many other products.

In 2005, the Energy Policy Act (EPAct 2005) set new standards for 16 products and directed DOE to set standards via rulemaking for another five. In 2007, Congress passed the Energy Independence and Security Act (EISA 2007), enacting new or updated standards for 13 products. EISA also included a requirement that DOE maintain a schedule to regularly review and update all standards and test procedures. In addition, both DOE and states regulate the energy efficiency of buildings.

Many of the pieces of equipment and process that consume electricity that could be part of an emitting source subject to reporting under the GHGRP or subject to possible emissions standards and limitations under the CAA, therefore, already must comply with DOE's efficiency standards (*e.g.*, electric motors, fans, cooling, pumps, certain valves, external power supplies, and commercial water heaters). EPA has not demonstrated that the CAA provides regulatory authority that displaces or preempts that already granted by Congress to DOE. Accordingly, an interest in energy efficiency is insufficient justification for EPA's proposed collection of energy consumption data.

Footnotes

[17] See, *e.g.*, Proposed Section 111 Rules, 88 Fed. Reg. at 33,244 (explaining the role of highly efficiency generating technologies as part of the proposed standards for fossil-based EGUs).

[18] See, *e.g.*, 88 Fed. Reg. at 32,887-88 ("…[w]ith the addition of purchased energy data under part 98, each facility's thermal fossil energy consumption to compare all facilities…within the [] sector on the same total energy consumption basis").

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA's regulatory authority is limited to addressing direct emissions. While this could include assessing the efficiency of a source's fuel consumption that results in direct emissions (*e.g.*, the efficient consumption of natural gas by an EGU), EPA is not statutorily authorized to regulate the non-emitting use of fuels. This is committed to DOE under EPCA. Moreover, EPA has not addressed that energy consumption data could be considered by some competitors to be confidential business information. See 88 Fed. Reg. at 32,907-08 (no proposed confidentiality determinations for proposed Subpart B).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 6

Comment Excerpt: EPA references CAA section 103(g) as independent authority to collect energy consumption data to "allow for a comprehensive assessment of how to best address GHG emissions and climate change under the CAA," including non-regulatory options.[19] EPA's invocation of section 103(g) is inapposite and does not provide EPA such authority.

The text of section 103(g) states that the Administrator "shall conduct a basic engineering, research, and technology program to develop, evaluate, and demonstrate nonregulatory strategies and technologies for air pollution prevention." 42 U.S.C. § 7403(g). This section goes on to state that:

[s]uch program shall include the following elements…improvements in nonregulatory strategies and technologies for preventing or reducing multiple air pollutants…from stationary sources, including fossil fuel power plants…[i]mprovements in nonregulatory strategies and technologies for reducing air emissions from area sources…[i]mprovements in nonregulatory strategies and technologies for preventing, detecting, and correcting accidental releases of hazardous air pollutants….improvements in nonregulatory strategies that dispose of tires in ways that avoid adverse air quality impacts.

Id. at § 7403(g)(3) (emphasis added). The language of this section sets out four specific elements of an engineering, research, and technology program, none of which provide EPA the ability to collect energy consumption data broadly or for unspecific "non-regulatory" efforts to reduce emissions from all potential source categories. This section of the CAA is narrowly focused. To the extent that it references "end-use efficiency," id. at §7403(g)(3)(A), the focus is on whether that could reduce emissions from fossil-based EGUs, not other emitting sources. Moreover, section 103(g) specifically states that nothing in this provision of the CAA shall not be construed to authorize the imposition of any air pollution control requirements. Id. at §7403(g)(3)(A). And, as noted, EPA does not have the authority to impose energy efficiency requirements on stationary sources, even if it would reduce emissions from EGUs.

Footnotes

[19] See 88 Fed. Reg. at 32,886.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 10

Comment Excerpt: The GHG Reporting Protocol notes, "scope 2 emissions physically occur at the facility where the electricity is generated."[24] These emissions, from sources that are regulated under the CAA, already are reported as direct emissions under GHRR subpart D, using continuous emissions monitoring systems, the recognized gold standard for direct emissions measurement. Accordingly, EPA already has this data and has not adequately explained the regulatory purpose—see, supra—in asking sources other than those required to report emissions under subpart C to report those emissions again. Moreover, EPA is about to embark on a rulemaking process to address GHG emissions from these sources under CAA section 111 as part of the Administrator's integrated, holistic approach to addressing emissions from the power sector. This will have more impact on the indirect emissions related to electricity purchases than any reporting regime could.

Footnotes

[24] GHG Reporting Protocol at 25.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 8

Comment Excerpt: It also is worth noting that attempting to quantify speculative indirect emissions of delivered electricity, or by attempting to quantify power purchase agreements (which are simply contractual terms and are not related to grid or source-specific emissions) would be speculative and imprecise —and therefore inconsistent with EPA's continuing efforts to ensure that data reported under the GHGRR are as accurate as possible. Concerns about the accuracy of data about indirect emissions related to energy consumption are well known. The GHGRR focuses on what is commonly referred to as "scope 1" or direct emissions, consistent with EPA's authority under the Clean Air Act. Indirect emissions from purchased power or other on-site energy consumption are referred to as "scope 2" emissions.

Other organizations have devoted significant resources to determining appropriate, and complicated, rubrics for the reporting of this data. For example, the GHG Reporting Protocol's Scope 2 guidance is an 111-page document that covers a range of complex issues, including three different approaches to scope 2 emissions accounting, each of which has implications for the accuracy and quality of the data reported, and addresses other issues including how to account for renewable energy purchases memorialized via renewable energy certificates, the implications of other entities' purchases of "clean" electricity on grid electricity, and how to address emissions factors provided by the electricity supplier (which, rather than simplifying accounting, results in the need to account for emissions using two different methods).[20,21]

A key portion of the determination of scope 2 emissions estimates is to establish the boundaries for any reporting of these indirect emissions. While EPA appears to believe that source-level reporting of emissions data related to electricity consumption is possible, see 87 Fed. Reg. 37,017-18, that level of granularity is inconsistent with the boundaries used by the GHG Reporting Protocol, which focus on corporate-level reporting. It also is inconsistent with how electricity is purchased. While individual facilities may have electricity meters, uses of electricity within a facility may not be separately metered, meaning that it would be difficult to separate the electricity purchased to be used in connection with the source subject to reporting under the GHGRR from the electricity used for purposes that do not fall into a GHGRR reporting subpart. EPA specifically requests comment on energy consumption source categories and how they should be defined, but EPA should take one step further back in evaluating such an approach at all. Namely, it will be extremely difficult-to-impossible for facilities to report this data as discussed *supra*, a challenge made even more difficult for facilities located in areas that operate under a Regional Transmission Organization (RTO) which dispatches power over a large regional area based on complex market rules.

Footnotes

[20] See GHG Protocol, GHG Protocol Scope 2 Guidance: An Amendment to the GHG Protocol Corporate Standard (2015), https://ghgprotocol.org/sites/default/files/standards/Scope%202%20Guidance_Final_Sept26.pdf. The GHG Protocol is the result of a collaboration between the World Resources Institute and the World Council for Sustainable Business Development.

[21] EPA's request for information on "existing industry standards for assessing the accuracy of the monitoring systems used for purchased energy transactions," 87 Fed. Reg. 37,018, underscores the challenge of scope 2 emissions and the complexity of their estimations. There are no such things as monitoring systems for assessing the accuracy of emissions related to indirect emissions from electricity purchases. EPA implies that there is some way to actually measure the emissions associated with delivered electricity. Given that all electrons are not "tagged" and cannot be traced from the point of generation to the point of consumption, actual measurement is impossible. Instead, estimating emissions rates for a utility, region, or balancing authority are the recognized options for attempting to account for emissions related to electricity consumption. See K. Palmer et al., Resources for the Future, Options for EIA to Publish CO_2 Emissions Rates for Electricity (Aug. 2022), https://media.rff.org/documents/Report_22-08.pdf. In any event, as this paper notes, Section 40412 of the recently passed Infrastructure Investment and Jobs Act directs the Energy Information Administration (EIA) to report "where available, the estimated marginal greenhouse gas emissions per megawatt hour of electricity generated" within each balancing authority and by pricing node (within a wholesale market). If EIA already is charged with undertaking this estimation effort, it is not clear what value there is to any additional reporting requirements under the GHGRR, especially given the limitations on EPA's authority to collect potentially relevant data in the first place.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 11

Comment Excerpt: Throughout this proposal, EPA asserts that the proposed changes and updates to the various emissions data collection and reporting protocols are "to improve the quality of the data reported under the program," 87 Fed. Reg. 36,924, and that the current proposed revisions "would enhance the quality and accuracy of the data collected under the GHGRP.," id. at 36,926. EPA also asserts that using new emissions factors for some sectors would "improve the accuracy of reported data" and that other revisions, including those to subpart DD, for example, "would improve the quality of the data collected" from certain industrial sectors. See id. at 36,926 and 36,927.

Definitionally, scope 2 indirect emissions data will not ever be as accurate or have the quality of the data reported to EPA from sources subject to the GHGRR. The GHGRR updates are focused on increasing the precision, accuracy, and quality of the data reported: adding scope 2 emissions to the mix would undermine that fundamental purpose. Should EPA move forward with indirect

emissions reporting requirements, it would be arbitrary to apply one set of standards to some reported data, but to abandon those standards for other data, particularly without any supporting rationale for disparate treatment.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0326-A1
Comment Excerpt Number: 1

Comment Excerpt: The Environmental Protection Agency (EPA) argues that its initiation of Subpart B is:" …to improve the completeness of the data collected under the GHGRP, add to the EPA's understanding of GHG data, and to better inform future EPA policy under the CAA, such as informing potential future EPA actions with respect to GHGs. Once collected, such data would also be available to improve on the estimates provided in the Inventory, by providing more information on the allocation of electricity use to different end use sectors."

In fact, it does not collect information on greenhouse gas (GHG) emissions. Instead, it requires operators to collect and submit information on the electricity and thermal energy used. Not only does this new Subpart effectively make these operators meter readers, it also misdirects their resources to obtain information far more readily available from electricity and thermal energy suppliers. From IPAA's perspective it does not provide GHG emissions information because, for example, the electric energy source could be composited from numerous types of generation options.

The EPA Subpart B proposal is a clear-cut example of mission creep. For EPA to gain any GHG emissions related information from this data, it must conduct detailed analyses of the sources of the electricity or thermal energy and somehow allocate estimates to individual sources. This is an unnecessary demand on limited EPA resources.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 7

Comment Excerpt: At this time, EPA has not articulated a legitimate regulatory purpose that comports with its statutory authority for the collection of energy consumption data via the

GHGRP. However, this does not mean that EPA will not be able to collect this data if it would serve a regulatory purpose. For example, if EPA wanted to move forward with proposed regulations for a particular source category under section 111, the Agency could use its section 114 authorities to seek relevant data to inform the development of that rule. In addition, EPA still retains authority to collect data about energy consumption or indirect emissions via an Information Collection Request (ICR), assuming that such requests are approved by the Office of Management and Budget's Office of Information and Regulatory Affairs (OIRA) and that they comport with EPA's own policies that such requests "be clearly dictated by the need to support decisions that serve an identifiable program mission."[20]

The benefit of both a rulemaking-specific request and an ICR is that they would allow EPA to seek more relevant data. As discussed in more detail below, the energy consumption data EPA proposes to collect under new Subpart B are not likely to provide EPA with the information necessary to assess energy efficiency or intensity at affected sources. A rulemaking-specific request or an ICR would allow EPA to appropriately tailor its data requests. More importantly, it would provide an opportunity for notice and comment from the relevant industry and other stakeholders as to the content of the ICR.

The stated purpose of EPA's information collection policy, and the Paperwork Reduction Act's 1995 amendments, is to minimize the paperwork burden imposed on the public by "information based" agencies, like EPA. To the extent that EPA's proposed Subpart B data collection for energy consumption fails to adhere to EPA's own policies on data collection, the Agency should reconsider this new requirement. However, as noted, if EPA later can articulate "an identifiable program mission" for the collection of such data, EPA can seek approval from OIRA for an ICR for the relevant source category or use section 114 to collect relevant data.

Footnotes

[20] See EPA Chief Information Officer, Information Collection, EPA Classification No. CIO 2134.0 (July 7, 2005), https://www.epa.gov/sites/default/files/2013-11/documents/cio2134.0.pdf.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council (ACC) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0325-A1
Comment Excerpt Number: 7

Comment Excerpt: As noted above, the Agency offers a variety of vague, unspecified reasons why it is proposing to expand mandatory reporting on indirect energy consumption and related procurement, business, and operational practices. All boil down to the same underlying theme – a generalized interest in the data for use in future policy efforts:

> *"such information is relevant to the EPA's ability to carry out a wide variety of CAA provisions."*[15]

"add to the EPA's understanding of GHG data, and to better inform future EPA policy under the CAA, such as informing potential future EPA actions with respect to GHGs."[16]

"Obtaining data on thermal energy product purchases would allow the EPA to better understand the use of this technology in different sectors and evaluate potential related policy options."[17]

As with section 114 of the Clean Air Act, these justifications fail to meet the standards of the Paperwork Reduction Act. EPA's desire for this information is not the same as a need. Federal PRA guidance require agencies to:

"Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and regulation mandating or authorizing the collection of information."[18]

"Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection."

Faced with the hard – but straightforward questions in OMB's guidance, EPA's justification for the proposed Subpart B is threadbare. The information collection associated with the rule fails the PRA's "practical utility" standard. Subpart B should be removed from any final rule.[19]

Footnotes

[15] GHGRP Proposal at 32886.

[16] Id. at 32885.

[17] Id. at 32886.

[18] PRA Guidance at 1.

[19] We acknowledge a PRA justification for the Agency's proposal if the data were necessary to ensure accuracy of direct emissions. However, that is not EPA's stated rationale.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29.

4.2 Comments on EPA's rationale for inclusion of energy consumption in Part 98

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 2

Comment Excerpt: We strongly support EPA's proposed addition of subpart B, which would require reporting on energy consumption from certain facilities.

Decarbonization of the economy will drive increased electricity consumption as well as demand for lower carbon energy products, like hydrogen. Better data on energy consumption from large facilities across various sectors is therefore needed to track trends and understand greenhouse gas emissions holistically across the economy. The GHGRP is uniquely suited to gather energy consumption data from large facilities in a context that is directly relevant to efforts to reduce greenhouse gas emissions.

We agree with EPA that the proposed subpart B would pose very little additional burden to existing reporters while providing valuable information on energy consumption, intensity, and efficiency that is of direct relevance to EPA's regulatory and non-regulatory efforts.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 20

Comment Excerpt: EPA should rely on the current collection of government energy consumption data compiled by other government agencies and should not institute additional requirements for facilities to report indirect energy consumption. As EPA is currently collecting direct GHG emissions data from between 85-90% of emission sources, collecting indirect emissions data would be highly redundant and would likely give rise to double-counting problems. EPA already collects detailed GHG emissions data from electric utilities under Subpart D of the GHGRP and from other combustion sources under Subpart C. In addition, the agency collects hourly emissions data from electric utilities under 40 C.F.R. Part 75 as part of the Acid Rain Program and other regulatory programs. The Energy Information Administration (EIA) collects detailed information concerning electricity and energy product sales, generation, transactions, consumption of fuels, and much more, and the EIA has been charged by Section 40412 of the Infrastructure Investment and Jobs Act with the task of estimating GHG emissions associated with electric generation provided to the market from each balancing authority. EPA should use these existing data collection sources as opposed to expanding the GHGRP collection to encompass indirect energy consumption.

Further, Duke Energy is concerned that EPA would intend to use the data to develop its own analysis of estimated emissions related to these indirect sources of energy. Such calculations and analysis by EPA may result in emissions estimates that conflict with other voluntary reporting protocols or future regulatory requirements in other programs. In many cases, providing site-specific indirect energy consumption can impose a significant administrative burden and require detailed procedures that must carefully consider how energy is accounted for within various processes and unrelated business operations. If EPA were to decide to proceed to collect this

additional information, it must better articulate the need for the expanded reporting and how the information will be used given the significant additional administrative burden.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 19

Comment Excerpt: The agency is taking comment on whether to require the reporting of indirect emissions from purchased electricity consumption and thermal energy products. As EPA is currently collecting direct emissions data from between 85- 90% of emission sources, collecting indirect emissions data would be highly redundant and would likely give rise to double counting problems. EPA already collects detailed GHG emissions data from electric utilities in Subpart D of this program that draws into question the value of the additional reporting and the associated cost. Energy consumption for facilities reporting under Subpart D is often self-generated and would already be reported under Subpart D. In addition, the agency collects hourly emissions data from utilities as part of the Acid Rain Program and other data for related regulatory programs. The Energy Information Administration collects detailed information concerning electricity and energy product sales, generation, transactions, consumption of fuels, and much more. With this information already collected by EPA and EIA, the agency should use these existing data collection sources as opposed to expanding the GHGRP collection to indirect emissions. If EPA were to decide to proceed to collect this additional information, the agency would need to first demonstrate that doing so meets the practical utility and least burdensome approach requirements of the PRA.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Leslie Bellas
Commenter Affiliation: American Fuels and Petrochemical Manufacturers (AFPM)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0323-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA proposes that facilities report "the annual quantities of electricity purchased, and the annual quantities of thermal energy products purchased."[10] The stated reason for this Proposal is "purchased energy consumed is produced offsite, the offsite energy

production can result in significant GHG emissions. Because the facility's production processes are reliant on its energy consumption, the emissions associated with producing this energy are associated with the facility."[11]

EPA touts that GHG data collected under the GHGRR covers 85-90 percent of US GHG emissions.[12] Yet, GHG emissions from electric generating units (EGUs), which sell energy to industrial users, are regulated under the CAA, and are already reported as direct emissions under GHGRR subpart D. EPA further collects hourly emissions data from utilities as part of the Acid Rain Program. Moreover, on May 23, 2023, EPA proposed new source performance standards under CAA Section 111 for GHG emissions from new, modified, and reconstructed fossil-fuel-fired EGUs, imposing yet additional regulatory layers on the electric utility sector to track and control their Scope 1 GHG emissions.[13] In addition to obtaining direct emissions data from EGUs, the Energy Information Administration (EIA) collects detailed information concerning electricity and energy product sales, generation, transactions, and fuel consumption. Collectively, the federal government already collects this information through multiple regulatory vehicles, making the proposed revisions both redundant and inefficient. Given the complexity and burden of facilities collecting indirect GHG emissions from third-party energy producers, the fact that EPA and EIA already collect these data, we strongly recommend that EPA withdraw this proposal. [14]

Footnotes

[10] Id. at 32,869. EPA's shift to require reporting of "energy consumption" recognizes the complexity and variety of ways that indirect emissions can be calculated and the implications for each. See *e.g.*, GHG Protocol, GHG Protocol Scope 2 Guidance: An Amendment to the GHG Protocol Corporate Standard (2015) at section 4.1. Available at https://ghgprotocol.org/sites/default/files/2023-pdf.03/Scope%202%20Guidance.

[11] 88 Fed. Reg. at 32,885.

[12] U.S. EPA, Learn About the Greenhouse Gas Reporting Program (GHGRP). https://www.epa.gov/ghgreporting/learn-aboutgreenhouse-gas-reporting-program-ghgrp.

[13] 88 Fed. Reg. 33,240 (May 23, 2023).

[14] See Paperwork Reduction Act, 44 U.S.C. § 3501 and 3504(c)(4) (data submissions should "maximize the practical utility of and public benefit from information collected by or for the Federal Government) (1995). See also 5 CFR Part 1320.3(l) (defining "practical utility" as "the actual, not merely the theoretical or potential, usefulness of information to or for an agency, taking into account its accuracy, validity, adequacy, and reliability …).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 4

Comment Excerpt: Finally, EPA has not clearly presented how its proposed Subpart B compares to emission information and energy consumption data collected by other agencies. As acknowledged by EPA,[13] the Department of Energy's Energy Information Administration collects this sort of data and reports annually on energy consumption by sector.[14]

At the very least, EPA must thoroughly evaluate potential overlap with existing data collection by its sister agencies. The fact that this overlap exists, moreover, supports the conclusion that requiring Scope 2-related information pursuant to the GHGRP exceeds EPA's authority under section 114 and is not relevant to the implementation of any specific CAA authorization. Accordingly, EPA should leave collection of this type of information to the Department of Energy and focus the GHGRP on direct emissions of GHGs by covered sources.

Footnotes

[13] "Due to the very close similarity between the information to be collected under the GHGRP and the information collected by DOE, EPA does not believe there is any reason to treat the information differently in the context of reporting this information to the EPA under this rule." Memorandum, "Proposed Confidentiality Determinations and Emission Data Designations for Data Elements in Proposed Supplemental Revisions to the Greenhouse Gas Reporting Rule" (May 2, 2023).

[14] See https://www.eia.gov/totalenergy/data/annual/.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Angie Burkhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0320-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA fails to provide information on how Subpart B emissions are not already being collected under the existing GHGRR requirements (*e.g.*, Subpart C and D) from the direct emissions from energy providers/producers or how it will avoid duplication or double-counting emissions if both the provider/producer and the energy consumer are reporting this information. Additionally, EPA fails to discuss if this type of data is already collected by other government agencies (*e.g.*, Energy Information Administration) and how EPA could use that data to avoid expanding the collection of data under the GHGRR.
EPA's Subpart B requirements provide significant concerns and burdens on Subpart W reporters to supply energy consumption information that includes substantial amounts of data to be collected, retained and reported. The burdens generally include:

- The quantity of purchased electricity and thermal energy products for every purchased energy product meter at a facility;

- The development of a Metered Energy Monitoring Plan (MEMP), which includes identifiers for each meter (including photographs), accuracy specifications, manufacturer's certifications, and other details;
- Documentation of quality assurance for purchased electricity monitoring including documentation that meters are conforming with appropriate ANSI standards;
- Documentation of quality assurance for purchased thermal energy including copies of the most recent audit of the accuracy of each meter in the purchasing agreement, and if the audit is more than 5 years old, documentation of a request for a new audit to the energy provider (and auditing the meter every 5 years); and
- The collection and reporting of detailed information for every single bill for every purchased energy product meter.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Leslie Bellas
Commenter Affiliation: American Fuels and Petrochemical Manufacturers (AFPM)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0323-A1
Comment Excerpt Number: 3

Comment Excerpt: Energy consumption data from purchasers will not necessarily enable EPA to calculate GHG emissions. Primarily, it is obvious that Scope 2 emissions will never be as accurate as having the actual producers of electricity and thermal energy each report their total direct emissions. The latter is already being done. In addition, while EPA seeks billing and location information, submitted data may not indicate whether purchased electricity or thermal energy was produced as a result of combustion activities or identify the fuel/feedstock used, each of which impacts the quantity of GHG emissions. Again, the Proposal to add subpart B has no practical utility, as required by the PRA, because electricity and thermal energy producers are already providing to EPA more accurate emissions information. In fact, EPA acknowledged as much in the final GHGRR, which states: "Moreover, the collection of indirect emissions data from the types of facilities covered by this rule (*e.g.*, facilities and suppliers with emissions over 25,000 metric tons of CO_2e) would not provide the complete picture or focus on the types of facilities that likely have large indirect emissions."[15] EPA has not adequately explained the basis for its about-face.

Footnotes

[15] 74 Fed. Reg. 56,260, 56,289 (Oct. 30, 2009).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA also inappropriately dismisses concerns about double-counting. EPA argues that double-counting is not implicated because EPA is not requiring indirect emission estimates[10] EPA further argues that double-counting is not the same as double reporting.[11] These positions are not persuasive. First, according to EPA, the point of collecting this information is to allow EPA to evaluate potential GHG policies. If the energy consumption is not ultimately tied to GHG impacts, then it is not appropriate to include it in a GHG reporting program at all. If, on the other hand, energy consumption information is intended to provide additional data on GHG emissions, EPA must acknowledge the confusion this information is going to create. EPA explains in the preamble that the purpose of this Proposed Rule is to better provide "a more comprehensive nationwide GHG profile reflective of the origins and distribution of GHG emissions in the United States.[12] By creating an inventory that will reflect emissions from power generation as direct emissions by power producers and as Scope 2 emissions information for energy users, the Proposed Rule will undoubtedly create a less useful, less accurate picture of nationwide emissions. EPA must take a clear stance. Does proposed Subpart B collect GHG information or not? If it does not, how can that information reasonably be included in a GHG reporting program? If Subpart B does collect GHG information, how does that information clarify, rather than confuse the nation's overall inventory of GHG emissions?

Footnotes

[10] 88 Fed. Reg. at 32,887.

[11] Id. at 32,888.

[12] Id. at 32,857.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 3

Comment Excerpt: AIPRO objects to requirements for reporting purchased energy consumption and indirect "scope 2" type emissions generally. Concerns about "double-counting"

remain. The electricity generation industry is currently required to report direct emissions associated with its operations. As a result, there is no value in other industry segments reporting the same emissions. In fact, it would be counter-productive in that it would miss-characterize and overstate emissions from purchased energy and overall GHG emissions inventories.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 7

Comment Excerpt: Under current GHGRP rules as well as proposed GHGRP revisions, there are multiple scenarios where emissions may be "double-counted," some of these include the below:

- Requiring indirect emissions (aka "Scope 2") reporting when other industry segments report the same emissions as direct emissions (aka "Scope 1")

AIPRO encourages EPA to identify and eliminate all potential double-counting scenarios. AIPRO welcomes the opportunity to collaborate with the agency on this effort.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Debra J. Jezouit
Commenter Affiliation: Class of '85 Regulatory Group
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0250-A1
Comment Excerpt Number: 4

Comment Excerpt: As EPA states in the Proposed Rule, commenters in 2009 indicated that the Potential Rule "would constitute double counting if direct emissions were collected from electric utilities and the EPA also collected electricity consumption from facilities and estimated emissions attributable to the facilities' electricity consumption."[13] The Class of '85 agrees that double counting of emissions would be a problem. If EPA decides to proceed with the Potential Rule, it should exclude electric utilities, because many facilities generate the power that is used in energy consumption, so any rule that requires reporting of both would result in double counting and the potential misrepresentation of GHG emission data. Given that, the Group has concerns over what purposes the multiple reporting of such GHG emissions data would serve.

Footnotes

[13] 87 Fed. Reg. 37,017.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 13

Comment Excerpt: Throughout the proposal, the Agency states that it is not requiring reporters to calculate or submit their indirect emissions, and states that the intent of EPA in creating this subcategory is to "compare the energy efficiency of different facilities within the same sector." Elsewhere in the proposed rule, the EPA states that they are interested in energy consumption data to "better inform our understanding of the potential indirect GHG emissions associated with certain sectors." The EPA acknowledges in the subpart that its proposals will allow users to more accurately estimate indirect emissions.

The Association believes that these contradictions and the nature of reporting energy consumption will lead to Agency and public estimates of indirect emissions. Creating reporting requirements for the purpose of estimating indirect emissions is outside of the program's purpose of measuring emitters' direct emissions. Requiring downstream energy users to report their purchase of electricity and thermal energy products to be used in estimating indirect emissions would result in double counting, as energy generating facilities already report their direct emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Leslie Ritts
Commenter Affiliation: National Environmental Development Associations Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0213-A1
Comment Excerpt Number: 6

Comment Excerpt: In its 2009 GHGRP rulemaking, EPA noted that "the collection of indirect emissions data from the types of facilities covered by this rule (*e.g.*, facilities and suppliers with emissions over 25,000 metric tons of CO_2e) would not provide the complete picture or focus on

the types of facilities that likely have large indirect emissions." See 74 Fed Reg. 56,289, (Oct. 30, 2009). We think that is still very much the case, and thus EPA's focus should remain on those energy consuming industry sectors, and not on a new subpart of Part 98 for energy consumption.

NEDA/CAP does not support amending the Part 98 with a separate "Energy Consumption" category. Because we remain firm in our belief that Scope 2 emissions from purchased electricity and/or thermal products like steam or cooling water is already captured by the existing reporting requirements, NEDA/CAP submits that additional supplemental reporting "Scope 2" emissions related to energy consumption could only be justified for certain categories of emission sources if those industry categories emit "significant" indirect and/or secondary emissions related to specific types of processes, and EPA therefore would need to determine if particular processes that are "powered" by purchased electricity or thermal steam or cooling water over and above those already reported by public utilities or under the Subpart C combustion unit category. NEDA/CAP also believes that a "general energy consumption" category, would sweep up a number of institutional sources such as hospitals, large apartment complexes, and commercial complexes that the agency thus far has declined to regulate and doubtless would find it difficult to manage that reporting obligation. Such sources might only reach the defined applicable level of GHG emissions for other reasons, such as leakage of refrigerants.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Leslie Ritts
Commenter Affiliation: National Environmental Development Associations Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0213-A1
Comment Excerpt Number: 8

Comment Excerpt: NEDA/CAP does not believe the adoption of energy consumption information described in the notice should be collected at this time because we do not think it would be particularly useful, if only because one of the most important policy justifications for collecting this information—that is, the source of electricity purchased and consumed—is rapidly changing-and has already changed significantly in the past several years. The advent of demand growth from purchases into the grid of electricity from homes and businesses equipped with solar systems and batteries, also could further complicate the collection of energy consumption into the regional power grids, as could the purchase of electricity by institution and commercial sources for electric vehicle recharging. (Such information also might better be collected from other federal and state agencies, including the public utility commissions.

NEDA/CAP also notes that for some of our members, electricity purchases are made at the corporate-level of the company, rather than at the "affected facility" level, which is required to report under the GHGRP. These corporate purchases might have details that are not available to

individual sites or are not available by the reporting deadline of the GHGRP, and the difference between market-based (utility- or contract-specific) emissions may be very pronounced from the location-based (default regional grid) values. In addition, affected facility values may not reflect the clean-energy investments made by our member companies, limiting the value and/or use of any such GHG emissions calculations for the Agency's decision-making or understanding.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 55
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: EPA has asked for comment on the potential for EPA to require reporting of quantities of energy (electricity, heating, cooling, and steam) purchased by a facility. API has created a reporting pathway for scope 2 emissions (indirect emissions from imported energy) in the API GHG Reporting Guidance and complementary Reporting Template.[7] The Industry Trades are generally supportive of the development of an approach by EPA to collect such data. However, there are significant hurdles that will need to be addressed, including the current practice of collecting and reporting such information at the firm-level rather than facility-level reporting that is required by 40 CFR 98. As such, we recommend that EPA proceed with a secondary rulemaking effort to ensure stakeholder consultation and a full notice-and comment period rather than establishing this new reporting subpart as a part of the finalization of this rulemaking.

Footnotes

[7] API, Guidance Document for GHG Reporting. March 2022. https://www.api.org/-/media/Files/Policy/ESG/GHG/Guidance-AP|-Template-for-Climate-related-Reporting-Initiative-March-2022.pdf

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 8

Comment Excerpt: Even if EPA had the statutory authority to require the reporting of energy consumption data or related indirect emissions, the data that EPA proposes to collect will not help EPA accomplish the goals the Agency outlines for such data. As a result, it is not clear what benefit EPA would obtain in exchange for imposing this reporting burden. This calls into question whether EPA has a sufficient justification for the proposed reporting of energy consumption data.

EPA's proposed energy consumption data collection requirements are too broad to be useful, particularly if the goal is to use this data to compare the energy intensity of different sources of the same type or class. EPA asserts that energy consumption data "is essential for identifying the most energy efficient facilities within each sector." 88 Fed. Reg. at 32,887. EPA does not explain, however, how the proposed energy consumption data to be reported will allow it to make those calculations in a way that could be considered sufficiently accurate to provide for meaningful energy efficiency comparisons.[21] The data would be based on billing information for an entire facility,[22,23] not just the emitting source that could be subject to regulation under EPA's CAA authority. It is very unlikely that the emitting source that has to report energy consumption data based on contracted for, metered, and billed electricity is the only end use of electricity at that particular site.[24] Instead, it is much more likely that many end uses are "commingled" in one bill, including, for example, lighting, heating, and cooling, in addition to any electricity that might be used in a process that results in direct emissions.[25] Accordingly, EPA will have no ability, based on contracts and electricity bills, to parse how much electricity was consumed by the relevant emitting facility. To that end, while EPA claims that it can use "standard engineering calculations"[26] to make this data comparable to sector-specific direct emissions data, see id., it is not at all clear how useful such comparisons would be given the inability to match usage to the relevant emitting facility. These concerns were raised in response to last year's proposal; EPA has not addressed them in this Supplemental Proposal.

EPA must better explain how this data actually could be useful in any sort of regulatory context given that the data will not actually be comparable before imposing such data collection requirements. As noted above, EPA itself is not an efficiency regulator and rendering broad interests in energy intensity is insufficient to justify burdensome data requests.

Footnotes

[21] As discussed above, EPA's regulatory authority is limited to addressing direct emissions. While this could include assessing the efficiency of a source's fuel consumption that results in direct emissions (*e.g.*, the efficient consumption of natural gas by an EGU), EPA is not statutorily authorized to regulate non-emitting use of fuels. This is committed to DOE under EPCA. Moreover, EPA has not addressed that energy consumption data could be considered by competitors to be confidential business information. See 88 Fed. Reg. at 32,907-08 (no proposed confidentiality determinations for proposed Subpart B).

[22] EPA's proposed data collection requirements apply to emitting facilities that already are subject to reporting requirements under the GHGRP. EEI does not read EPA's proposed regulatory text to extend the requirement to report purchased power to any entity that is not already subject to direct emissions reporting requirements, which would exclude local electric and gas distribution companies (LDCs). See proposed 40 C.F.R. § 98.20(a) ("The energy consumption source category consists of

direct emitting facilities that purchase metered electricity…are required to report under §§ 98.2(a)(1), (2), or (3)…"). If EPA believes that energy consumption reporting obligations extend to other facilities or entities, especially those that do not already have an obligation to report emissions under the GHGRP, the Agency would be required to propose this in a separate rulemaking to explain the basis for its authority to do so, among other things.

[23] If EPA finalizes the proposal to require certain sources that already report emissions under the GHGRP to report energy consumption, the Agency should specifically exclude Subpart DD, which covers electricity transmission & distribution (T&D) systems. To the extent that these facilities purchase electricity via contract, these are sales for resale to end-use customers and do not reflect the T&D systems' own consumption of that electricity. Collecting such data, therefore, would not assist EPA in any sort of efficiency analysis related to T&D systems. Similarly, EPA should consider exempting de minimis amounts of consumed electricity. For example, the electricity necessary to run metering and regulation stations used by natural gas LDCs, which are regulated under Subparts NN and W.

[24] EPA's proposed data reporting requirements are limited to those entities that have existing contracts for energy consumption. See proposed 40 C.F.R. § 98.20(b)(2). EPA uses the phrase "purchasing agreements" in this context but does not define this term. "Purchasing agreements" generally are not used between local distribution companies and their customers but are tools that are employed for wholesale purchases of power and by some larger commercial and industrial customers in states where such direct purchases of electricity are permitted by law. This would exclude a large number of sources that are otherwise required to report direct emissions under the GHGRP because they do not contract for electricity, but instead take service under the relevant tariff, as approved by the relevant public utility regulator. This further limits the comparability benefits of any data that could be collected. Even if EPA redefined the source category to include direct emitting source that receives an electricity bill, however, this would not overcome the challenges that EPA would have in using this data to make accurate energy intensity comparisons, as discussed in these comments.

[25] It may be important to recall here that consumption of electricity onsite to run equipment or processes does not result in any additional emissions (beyond those that were emitting when converting a fuel to electricity at an EGU).

[26] EPA provides no examples of such calculations, so it is impossible to assess whether those calculations actually provide useful data or are otherwise appropriate to achieve EPA's stated goals.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 3

Comment Excerpt: The data that EPA proposes to collect will not help EPA accomplish the goals the Agency outlines for such data. As a result, it is not clear what benefit EPA would obtain in exchange for imposing this reporting burden. EPA's proposed energy consumption data

collection requirements are too broad to be useful, particularly if the goal is to use this data to compare the energy intensity of different sources of the same type or class.

EPA does not explain how the proposed energy consumption data to be reported—which will be based on billing information for an entire facility, not just the emitting source that could be subject to regulation under EPA's CAA authority— actually will allow it to make those calculations in a way that could be considered sufficiently accurate to provide for meaningful energy efficiency comparisons.[18] It is unlikely that the emitting source that has to report energy consumption data based on contracted for, metered, and billed electricity is the only end use of electricity at that particular site.[19] Instead, it is much more likely that many end uses are "commingled" in one bill, including, for example, lighting, heating, and cooling, in addition to any electricity that might be used in a process that results in direct emissions.[20] EPA will have no ability, based on contracts and electricity bills, to parse how much electricity was consumed by the relevant emitting facility. While EPA claims that it can use "standard engineering calculations"[21] to make this data comparable to sector-specific direct emissions data, see id., it is not at all clear how useful such comparisons would be given the inability to match usage to the relevant emitting facility. Although numerous commenters raised these concerns in response to last year's proposal; EPA has not addressed them in this Supplemental Proposal.

Footnotes

[18] As discussed above, EPA's regulatory authority is limited to addressing direct emissions. While this could include assessing the efficiency of a source's fuel consumption that results in direct emissions (e.g., the efficient consumption of natural gas by an EGU), EPA is not statutorily authorized to regulate the non-emitting use of fuels. This is committed to DOE under EPCA. Moreover, EPA has not addressed that energy consumption data could be considered by some competitors to be confidential business information. See 88 Fed. Reg. at 32,907-08 (no proposed confidentiality determinations for proposed Subpart B).

[19] EPA's proposed data reporting requirements are limited to those entities that have existing contracts for energy consumption. See proposed 40 C.F.R. § 98.20(b)(2). EPA uses the phrase "purchasing agreements" in this context but does not define this term. "Purchasing agreements" generally are not used between local distribution companies and their customers but are tools that are employed for wholesale purchases of power and by some larger commercial and industrial customers in states where such direct purchases of electricity are permitted by law. This would exclude a large number of sources that are otherwise required to report direct emissions under the GHGRP because they do not contract for electricity, but instead take service under the relevant tariff, as approved by the relevant public utility regulator. This places further limits on the comparability benefits of any data that could be collected. Even if EPA redefined the source category to include direct emitting source that receives an electricity bill, however, this would not overcome the challenges that EPA would have in using this data to make accurate energy intensity comparisons, as discussed in these comments

[20] It may be important to recall here that consumption of electricity onsite to run equipment or processes does not result in any additional emissions (beyond those that were emitting when converting a fuel to electricity at an EGU).

[21] EPA provides no examples of such calculations, so it is impossible to assess whether those calculations actually provide useful data or are otherwise appropriate to achieve EPA's stated goals.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0293-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA has not adequately explained the basis for adding Subpart B to the GHG reporting program. One of EPA's key stated bases for including reporting requirements on sources covered by new Subpart B is that reporting on energy consumption would give EPA a better understanding of energy intensity and efficiencies experienced by various facilities and industrial sectors.[5]

However, Subpart B reporting as contemplated in the proposal would not capture data on total energy consumption but rather only purchased energy consumption, *i.e.*, a subset of overall consumption data. Because EPA would not be capturing a complete set of data, it would not be able to obtain an accurate assessment of energy intensity or efficiency. Beyond that, EPA has not adequately explained how the concept of "energy efficiency" would be assessed nor how the limited set of data gathered under Subpart B could be translated into an accurate and useful understanding of energy intensity or efficiency.

Footnotes

[5]88 Fed. Reg. 32885 (May 22, 2023).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 12

Comment Excerpt: Requiring downstream energy users to report their energy purchases and related data would not further the program's intended purpose of quantifying direct greenhouse gas emissions. Instead, it goes beyond its purview by trying to allocate where the emitters' products go and how they are used after their emissions have already been accounted for. The emissions associated with producing electricity and thermal energy products are reported by the source that generated the electricity or the thermal energy product.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Patti Hershey
Commenter Affiliation: Lower Colorado River Authority Transmission Services Corporation (LCRA)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0303-A1
Comment Excerpt Number: 7

Comment Excerpt: EPA states numerous reasons for the Proposed Rule including "to improve the completeness of the data collected under the GHGRP, add to the EPA's understanding of GHG data, and to better inform future EPA policy under the CAA, such as informing potential future EPA actions with respect to GHGs."5 EPA explains further that it is "interested in collecting data on energy consumption to gain an improved understanding of the energy intensity (*i.e.*, the amount of energy required to produce a given level of product or activity, both through onsite energy produced from fuel combustion and purchased energy) of specific facilities or sectors, and to better inform our understanding of energy needs and the potential indirect GHG emissions associated with certain sectors." EPA's interest in the data is made more clear by the examples EPA provides of the chemical manufacturing sector which has electricity consumption approximately equal to its direct emissions. Other sectors cited are food, beverage, and tobacco production, textile mills, wood products, primary metals, fabricated metal products, transportation equipment, furniture products, chemicals, nonmetallic mineral products, and primary metals. As noted in the preamble, these sectors report under 26 subparts of the current rule. EPA does not provide its reasoning for requiring reporting beyond these sectors identified as energy intensive. LCRA TSC recommends that EPA limit the proposed energy consumption reporting to those sectors and in any event exempt Subpart DD.

In fact, the energy usage at electric transmission facilities like substations is very small relative to other large industrial sources included in the current reporting program. There is very little, if any, opportunity to find efficiencies. Any potential efficiencies found would be miniscule. Additionally, as described above, energy use at these facilities is very-site specific as is the way they receive the energy. There is no one-size-fits-all solution to reduce energy uses at Subpart DD facilities. Finally, EPA will not even get a complete picture of energy use at Subpart DD facilities because of the non-metered ways some sources are powered. The benefit to EPA from reporting the proposed data does not justify the amount of cost and administrative burden to Subpart DD facilities.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0311-A1
Comment Excerpt Number: 2

Comment Excerpt: The additional reporting burden of requiring reporters (under Subpart I, Subpart C, and other subparts) to track energy use outweighs any potential benefit of such reporting. SIA questions the semiconductor industry's ability to provide the information required in Subpart B and the usefulness of such information to the Agency. A source's direct greenhouse gas emissions do not necessarily correlate to its energy usage. Therefore, energy usage is not information EPA should "reasonably require" for the purposes of "developing or assisting in the development of any implementation plan, an emission standard under sections 111, 112 or 129, determining if any person is in violation of any such standard or any requirement of an implementation plan, or 'carrying out any provision' of the Act."

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 9

Comment Excerpt: EPA states that it would use energy consumption data "to improve on the estimates provided in the Inventory," 88 Fed. Reg. at 32,885, referring EPA's annual production of the Inventory of U.S. Greenhouse Gases Sources and Sinks (Inventory), which is a compliance obligation under the U.N. Framework Convention on Climate Change (UNFCCC). Despite this assertion, such energy consumption data and related indirect emissions assessments are not required for the compliance of the Inventory, nor would they improve the estimates that the U.S. uses in that Inventory. Accordingly, this does not provide independent justification for EPA's proposal to collect this data.[27]

The Intergovernmental Panel on Climate Change (IPCC) provides guidance as to how to calculate, or estimate, national emissions from key sectors. It also provides guidance as to how to report such data so that it is comparable across nations that participate in the UNFCCC, as well as provides guidance as to best practices for ensuring the quality and control of data collection and reporting.[28] The IPCC's guidance addresses data collection relative to direct sources of emissions—focusing on emissions related to combustion of fossil fuels, industrial process, agriculture and forestry, waste, minerals, the chemical industry, fuel refining, and the use of ozone depleting substances, among others—and does not require the collection of data related to indirect emissions.[29] As set forth in the 2006 Guidance, the general approach to emissions quantification for national GHG emissions inventories is to multiply activity data by emissions factors. This is inherently, therefore, an exercise in direct emissions estimation. EPA has not explained how energy consumption data will help with the derivation of these direct emissions estimates, nor has the Agency cited any IPCC requirement to bolster direct emissions estimates

in some way using energy consumption data or related indirect emissions. The most recent supplement to the 2006 Guidance is silent on the issue of indirect emissions and the use of energy consumption data.[30]

Moreover, the goal of the 2006 Guidance (and subsequent supplements) is to ensure complete, consistent, comparable, and accurate inventories.[31] Throughout this Supplemental Proposal, EPA says that it shares these goals.[32] EPA has not indicated how the U.S.'s decision to deviate from IPCC methodologies to somehow incorporate indirect emissions into direct emissions estimates for key sectors will complement the effort to ensure that data is comparable across nations (or how such actions will affect the ability to compare U.S. emissions sources and sinks data over time). EPA should ensure that any actions it takes to modify how the U.S. Inventory data are collected are consistent with IPCC guidance.

Footnotes

[27] Maintaining consistency with IPCC methodologies for the collection of emissions data related to sources and sinks to further the goals of data comparability across nations that participate in the UNFCCC is an appropriate consideration, however, for the proposed updates to the emissions factors (global warming potentials) for the GHG emissions that are reported by direct emitters under the GHGRP. EPA should update these factors consistent with IPCC's Fifth Assessment Report (AR5) as proposed. See 88 Fed. Reg. at 32,857-60.

[28] See generally, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html, and the related supplements (collective 2006 Guidance).

[29] The one exception is for indirect emissions of N_2O from the atmospheric deposition of nitrogen in NOx and NH3. See 2006 Guidance at ch.7.

[30] See 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, https://www.ipcc-nggip.iges.or.jp/public/2019rf/index.html.

[31] See 2006 Guidance, Preface, at p. vi.

[32] See, *e.g.*, 88 Fed. Reg. at 32,857, 32,858.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 1

Comment Excerpt: As EPA extensively documents in the preamble to the recently proposed Clean Air Act (CAA or Act) section 111 regulations to address GHG emissions from fossil-based electric generating units (EGUs), the power sector is undergoing transformational and structural change with respect to the fuels used to generate electricity, resulting in significant GHG emission reductions over the last decade.[5] As of the end of 2022, emissions from the sector have been reduced 36 percent below 2005 levels.[6] In recently released modeling, EPA notes that,

if finalized, the Proposed Section 111 Rules will further reduce emissions another 40 percent by 2042 (over a 2021 baseline).[7] As EPA notes in the preamble to the Proposed Section 111 Rules, the power sector has been able to reduce emissions more quickly than EPA's estimates of the impacts of proposed emissions standards and without the actual implementation of any such standards.[8] This makes it likely that EPA's estimates are conservative and that greater reductions could be achieved over this same period.

As discussed in more detail below, proposed new Subpart B would require that some entities subject to the GHGRP also report information related to their energy consumption, as indirect emissions from energy consumption could be larger than those related to the direct emissions reported by those facilities.[9] EPA also states that "understanding the energy intensity of the facilities and sectors reporting under the GHGRP would also allow the EPA to identify industry specific best operating practices for increasing energy efficiency and reducing GHG emissions..." Id. In explaining the need for this data, however, EPA fails to consider that these indirect emissions already are being addressed directly—via EPA's own regulations. EPA also fails to explain how indirect regulation of GHG emissions via electricity consumption would better, more efficiently, or more effectively reduce emissions than directly regulating emitting EGUs. Clearly, direct regulation will reduce emissions both from EGUs and for those who consume electricity as an energy product. While EPA has asserted a policy interest in possibly regulating the energy efficiency of other sectors as a way to reduce economy-wide emissions, practically speaking, it is not clear such focus will continue to be warranted or whether the data collection burdens associated with the proposal to collect energy consumption data are justified in light of ongoing and expected power sector GHG emissions reductions. Moreover, as discussed in more detail below, EPA does not have the regulatory authority to collect data regarding energy consumption or to regulate the energy consumption efficiency of emitting sources.

At minimum (and not conceding EPA's statutory authority to collect such data), before finalizing any requirements to report energy consumption, EPA must address with much greater specificity how valuable such information really will be to any future regulatory efforts given expected emissions reductions from the power sector itself and its own regulatory limitations.

Footnotes

[5] See New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emissions Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, 88 Fed. Reg. 33,240, 33,255-59 (May 23, 2023) (Proposed Section 111 Rules).

[6] See id. at 33,260.

[7] See, generally, Regulatory Impact Analysis, ch. 4, EPA-452/R-23-006 (May 2023) (estimating that total emissions reductions, in terms of millions of metric tons, from the implementation of the proposed standards for new natural gas-based EGUs and existing coal-based EGUs; the total reduction is 46 percent over 2021 levels when including the proposed standards for existing natural gas-based EGUs).

[8] See 88 Fed. Reg. at 33,260.

[9] See 88 Fed. Reg. at 32,885.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 9

Comment Excerpt: The Securities and Exchange Commission (Commission or SEC) recently has proposed to require public companies to report scope 1, 2 and 3 emissions as part of filings that are regularly made to Commission."[22] The SEC largely is proposing to adopt the GHG Reporting Protocol's approach to quantifying and reporting scope 2 emissions, which, as noted, focuses on corporate-level reporting. EPA's apparent approach appears to be meaningfully different, as it would focus on sources subject to reporting under the GHGRR, and not on corporate level reporting. Not only would this create significant additional work for companies (the SEC estimates that it will take companies approximately 4,000 hours to comply with these new reporting requirements,[23] which many think is a significant underestimation) as they would have to prepare two different sets of indirect emissions estimates, but additional estimates of indirect emissions for EPA will likely further muddle the effort to understand what these emission means by providing contradictory or noncomparable estimates. This will lead to confusion and additional implementation challenges for both the SEC and companies reporting their emissions data under the Commission's rules. Accordingly, EPA should not move forward with its own, different approach to reporting indirect emissions related to electricity consumption.

Footnotes

[22] The Enhancement and Standardization of Climate-Related Disclosures for Investors, 87 Fed. Reg. 21,334 (Apr. 11, 2022). Reporting Release available at https://www.sec.gov/rules/proposed/2022/33-11042.pdf.

[23] See Reporting Release at 450.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Theresa Pugh Consulting, LLC
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0295-A1
Comment Excerpt Number: 2

Comment Excerpt: The SEC has stated it will finalize and issue new reporting rules addressing GHG emissions based upon their proposed rule from 2022. Based upon the proposal of the SEC rule, this reporting will have extensive obligations for corporations based upon Release No. 33-11042. The SEC's final rule is expected to require extensive financial information and disclosures as well as requiring attestation of disclosures by regulated companies.

There is no justification for the EPA to also ask for information on energy use if the SEC requires extensive climate disclosure. Their authority in the public reporting to SEC by publicly traded companies simply makes it more clear that the EPA should not be asking for energy data. Should the SEC retain its proposed Scope 3 disclosure data the publicly traded companies will already be submitting extensive "downstream" emissions data. There is no need for yet another regulatory authority to ask similar information on energy use, energy type, and source.

Note: commenter is not an attorney and is not offering any legal authority opinions about SEC regarding Scope 2 and 3 information collection. Nor is commenter offering opinion about whether Congress authorized SEC to require these disclosures.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.3 Comments on the definition of the source category

Commenter Name: Leslie Ritts
Commenter Affiliation: National Environmental Development Associations Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0213-A1
Comment Excerpt Number: 5

Comment Excerpt: If EPA were to collect energy consumption information, it must carefully define the type of information it will require be reported. There is still substantial confusion, including regrettably in the two-pages of this NPRM devoted to this issue, on the proper definition of what emissions from purchased electricity or indirect Scope 2 GHGs would be the "target" of regulation. That confusion, we submit, contributes to the "still-live" debate about whether reporting energy consumption emissions "double count" those already "counted and reported" by energy producers. The agency's proposals thus far, have disagreed with the "double-counting" arguments raised in response to EPA's 2009 NPRM on reporting GHGs from energy consumption. In the June 21st Notice, NEDA/CAP submits that despite reciting the agency's responses to the 2009 NPRM, it regrettably still fails to provide a usable definition of the GHGs directly emitted from energy consumption. We don't dispute that there may be such emissions, but the source of such emissions and accounting for them would require more regulatory precision.

Moreover, NEDA/CAP questions whether converting "therms" or energy products like steam purchased directly from a utility is a reasonable basis for estimation of additional GHGs, that may result from particular processes of already regulated facilities under Part 98 regulations. Indeed, these may already be reported by certain industries into e-GGRT. More generally, EPA

has to define carefully, the character of the GHGs that are produced by energy consumers, to determine whether it is necessary to collect that data, particularly if the 2009 policy purpose for collecting such information has been overtaken by other events.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 31

Comment Excerpt: EPA additionally asks whether reporting on energy consumption "should include purchased thermal energy products, and whether or not associated reporting requirements should differentiate purchased thermal energy products from purchased electricity.[241] At minimum, the reporting requirements should distinguish purchased electricity from purchased thermal energy products, to provide useful information on the quantity and quality of electricity that reporting entities secure. Nonetheless, we urge EPA to require reporting of all purchased energy; in evaluating the emissions advantages of energy efficiency measures, electrification, and other greenhouse gas abatement techniques, it will be important to account for indirect emissions from all forms of purchased energy, across all facilities that are required to report going forward.

Footnotes

[241] 87 Fed. Reg. at 37,018.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 31

Comment Excerpt: EPA additionally asks whether reporting on energy consumption "should include purchased thermal energy products, and whether or not associated reporting requirements should differentiate purchased thermal energy products from purchased electricity." 87 Fed. Reg. at 37018. At minimum, the reporting requirements should distinguish purchased electricity from

purchased thermal energy products, to provide useful information on the quantity and quality of electricity that reporting entities secure. Nonetheless, we urge EPA to require reporting of all purchased energy; in evaluating the emissions advantages of energy efficiency measures, electrification, and other GHG abatement techniques, it will be important to account for indirect emissions from all forms of purchased energy, across all facilities that are required to report going forward.

Regarding the attributes of electricity purchases, EPA suggests that relevant information could include "summary data elements . . . characterizing associated markets and products (*e.g.*, regulated or de-regulated electricity markets and renewable attributes of purchased products)." Id. These data elements would likely prove useful in estimating indirect emissions associated with electricity purchases. In addition, EPA should ensure that more-detailed data are also reported, such as the eGRID subregion in which, and the entity from which, the facility purchases electricity. EPA should also consider requiring sources to report the full range of data in energy attribute certificates, including novel elements such as storage-related tags, hourly or sub-hourly timestamps, grid carbon-intensity snapshots, and social or community benefit credentials.[99] These more-granular, readily reported data would enable EPA to evaluate the success that various industrial subsectors or companies have found in procuring carbon-free electricity that promotes emerging technologies and benefits underserved communities.

Footnotes

[99] See Doug Miller, Clean Energy Buyers Ass'n, Energy Attribute Certificate Issuing Bodies Can Unleash Next Generation Procurement by Capturing More Attributes & Better Serving as a "Platform of Platforms" (June 30, 2022), https://cebuyers.org/blog/energy-attribute-certificate-issuing-bodies-can-unleash-next-generation-procurement-by-capturing-more-attributes-better-serving-as-a-platform-of-platforms/.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 46

Comment Excerpt: The definition of thermal energy that states "or any other medium used to transfer thermal energy and delivered to a facility" is overly broad and ambiguous. For example, it is unclear if purchased raw water utilized as cooling tower make-up water would be subject to the requirements, even though there may be no associated indirect emissions. The Industry Trades request clarification of the definition of thermal energy to only include thermal products where the primary reason for purchase is energy transfer and where energy was required to achieve a specific thermal property for the purchased products prior to metering. Similarly, the

Industry Trades recommend incorporation of a reference temperature (*e.g.*, outside of ambient) to define thermal energy products to avoid confusion.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 47

Comment Excerpt: EPA's proposed definition of thermal energy also includes refrigerants. Clarification should be made that this excludes non-industrial process uses such as refrigerants for comfort cooling and food storage. In most cases these are not "metered," but this exclusion would avoid confusion. The Industry Trades respectfully recommend adding the proposed language in red below:

"Thermal energy products means metered steam, hot water, hot oil, chilled water, refrigerant, or any other medium used to transfer thermal energy and delivered to a facility subject to this subpart. Thermal energy products do not include those used for non-industrial purposes such as comfort heating/cooling and food storage/preparation."

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 6

Comment Excerpt: EPA's proposed data reporting requirements are limited to those entities that have existing contracts for energy consumption. See proposed 40 C.F.R. § 98.20(b)(2). EPA uses the phrase "purchasing agreements" in this context but does not define this term. "Purchasing agreements" generally are not used between local distribution companies and their customers but are tools that are employed for wholesale purchases of power and by some larger commercial and industrial customers in states where such direct purchases of electricity are permitted by law. This would exclude a large number of sources that are otherwise required to report direct emissions under the GHGRP because they do not contract for electricity, but instead

take service under the relevant tariff, as approved by the relevant public utility regulator. This places further limits on the comparability benefits of any data that could be collected. Even if EPA redefined the source category to include direct emitting source that receives an electricity bill, however, this would not overcome the challenges that EPA would have in using this data to make accurate energy intensity comparisons, as discussed in these comments.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: James D.W. Roush
Commenter Affiliation: CMS Energy Corporation
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0307-A1
Comment Excerpt Number: 2

Comment Excerpt: The preamble analysis found, based on the most recent Manufacturing and Energy Consumption Survey published by the DOE, that specific manufacturing sectors have indirect GHG emissions from electricity consumption approximately equal to or greater than the sector's direct GHG emissions. EPA stated it would find the consumption data useful for identifying the most energy efficient facilities. Based on this, we recommend that if EPA opts to implement this new reporting requirement, the focus of Subpart B should be on those sources that are subject to 40 CFR Part 98 reporting under the energy intensive sector subparts, and that natural gas distribution facilities should be exempt from this new reporting requirement.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Patti Hershey
Commenter Affiliation: Lower Colorado River Authority Transmission Services Corporation (LCRA)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0303-A1
Comment Excerpt Number: 1

Comment Excerpt: LCRA TSC respectfully requests that the EPA consider excluding the transmission category of sources from the proposed requirement to report energy usage annually. For reasons described below, the unique nature of this category will make the data required by this Proposed Rule unusable by EPA for its stated purpose -- providing a more "comprehensive assessment of the quantity of energy required to operate the facility because industrial operations can consume a significant amount of energy for which GHG emissions do not occur at the production site, primarily through purchased electricity and thermal energy products." Further,

the proposed data collection will be especially onerous given the numerous small units that would make up the transmission system and the number of meters and electric providers that would have to be included.

The current Greenhouse Gas Reporting Rule (GHG RR or Reporting Rule) applies to "large industrial sources across 41 source categories,"[2] many very specific. The majority of these source categories involve large sources often located at a single site. However, the Subpart DD category is different. The applicability threshold under 40 CFR § 98.301(a) is:

(a) You must report GHG emissions from an electric power system if the total nameplate capacity of SF_6 and PFC containing equipment (excluding hermetically sealed-pressure equipment) located within the facility, when added to the total nameplate capacity of SF_6 and PFC containing equipment (excluding hermetically sealed-pressure equipment) that is not located within the facility but is under common ownership or control, exceeds 17,820 pounds and the facility meets the requirements of § 98.2(a)(1).

For entities such as LCRA TSC, reporting under the GHG RR requires the collection of data regarding SF_6 and PFC containing equipment that is in use at its 433 substations as well as equipment that is stored in warehouses awaiting use or that has been retired and sent off-site during the reporting year. The focus of reporting for this category is to identify GHG emissions resulting from leakage. In this way, the source category is entirely different from those involving large production facilities that create GHG through chemical reactions or through combustion of fuel.

The sources that report under Subpart DD are typically electric transmission and distribution systems spread over a large area. For LCRA TSC, this primarily involves hundreds of substations located along thousands of miles of transmission lines, throughout the ERCOT region of Texas. These systems are nothing like "large industrial sources" EPA describes in the Reporting Rule. Due to the makeup of these systems and the distance between them, each facility is a separate electricity consumer and, if metered, has its own account with a power supplier. Instead of just collecting the monthly electric bills each year, these systems will be forced to collect bills for each facility, often numbering in the hundreds, which are from numerous electric providers, each with its own metering and service. In addition to the bill tracking, these systems will be required to develop a metering plan which includes information on each and every power supply meter in use at the many substations. Obtaining the required information about all of these meters from the numerous companies would be very onerous.

For the most part, energy is used at a substation to power the control enclosure and any maintenance or construction needed around the site. The control enclosures are typically well insulated, small structures that use power for climate control for the enclosed equipment, communication and telemetric equipment, and security. The electric bill for these substations would typically be smaller than that of a single-family residence. There is very little to be gained by studying these very small energy consumers even when they are aggregated.

Additionally, the energy usage is not linked in any way to the emissions of SF_6 that might occur from the equipment such as switches, circuit breakers, and transformers. While EPA seems to say that it would require reporting only on energy usage associated with the direct emitting facility[3], it is not clear how that would work in the context of a substation. The Proposed Rule seems to contemplate the reporting of energy usage anywhere at the site. If EPA is proposing

that energy consumption in the control enclosure or maintenance work around the site should not be included in the reporting, EPA should make that much clearer.

Footnotes

[2] 88 Fed. Reg. 32852, 32885 (May 22, 2023).

[3] "Regarding the comment concern about differentiating electricity use between activities supporting the industrial activities related to the source reporting direct emissions to the GHGRP versus those not related to industrial source activities, the EPA is proposing to allow the use of company records or engineering judgment to make these estimates." 88 Fed. Reg. 32852, 32889 (May 22, 2023).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Patti Hershey
Commenter Affiliation: Lower Colorado River Authority Transmission Services Corporation (LCRA)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0303-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA has proposed to require reporting only for the energy consumption that is metered. It is important to understand that power is provided to transmission sites in several different ways. Despite EPA's expectation that energy usage without a purchasing agreement is uncommon,[4] it is quite common among Subpart DD facilities. In some cases, the power can be pulled from the high voltage line running through the substation and then stepped down in voltage for use onsite. Or a substation might pull power from a "low side" interconnection using a service transformer. Neither of these power supplies would be captured by the Proposed Rule because they are not metered. Another way power is supplied might be from a third-party distribution entity. In this case, the substation would be metered and billed for the power. Which option, or combination of options, is used at a specific substation is very site-specific and can vary due to location, the size of the site, and many other factors. This means that any data supplied to EPA under the Proposed Rule would be of little to no value due to the incomplete picture that it would portray and the site-specific nature of the data.

Footnotes

[4] 88 Fed. Reg. 32852, 32889 (May 22, 2023).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Class of '85 Regulatory Response Group

Commenter Type: Other
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0329-A1
Comment Excerpt Number: 3

Comment Excerpt: The Class of '85 requests that EPA clarify that the revised energy consumption and electricity purchase reporting requirements do not apply to Transmission and Distribution facilities subject to Subpart DD. Certain facilities in this category transmit electricity to the grid, which may contain electricity produced by IPPs that already are subject to emissions reporting requirements as suppliers or direct emitters. The Group recognizes that a footnote to Table 10 indicates that Subpart DD facilities are expected to be "affected due to the proposed revisions to Table A–1 to subpart A only."[5] EPA should confirm this directly.

Footnotes

[5] The proposed revisions to Table A–1 to subpart A relate to adding new figures for the listed global warming potentials, which are not the subject of these comments. Id. at 32,911.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.4 Comments on reporting threshold and proposed approach to limit applicability to facilities that are currently subject to the GHGRP

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 28

Comment Excerpt: EPA requests comment on future revisions to the GHGRP that would add requirements related to energy consumption.[230] These revisions could provide both "information on industrial sectors where currently little data is reported to GHGRP" and "a means for the EPA to better estimate and understand U.S. GHG emissions and trends that could inform future policies.[231] We support these goals and urge EPA to take a broad approach. Specifically, within each category covered by part 98, EPA should require owners and operators of facilities that already report emissions under the GHGRP and of facilities of comparable size and function (in terms of capacity to consume energy and/or total energy input) to report the quantities and attributes of the electricity and other energy that they purchase.

Footnotes

[230] 87 Fed. Reg. at 37,016.

[231] Id. at 37,017.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 29

Comment Excerpt: EPA requests comment on future revisions to the GHG Reporting Rule that would add requirements related to energy consumption. 87 Fed. Reg. at 37016. These revisions could provide both "information on industrial sectors where currently little data is reported to GHGRP" and "a means for the EPA to better estimate and understand U.S. GHG emissions and trends that could inform future policies." Id. at 37,017. We support these goals and urge EPA to take a broad approach. Specifically, within each category covered by part 98, EPA should require owners and operators of facilities that already report emissions under the GHG Reporting Rule and of facilities of comparable size and function (in terms of capacity to consume energy and/or total energy input) to report the quantities and attributes of the electricity and other energy that they purchase.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 30

Comment Excerpt: We recommend the broader approach: requiring reporting on energy consumption (including electricity purchases) from currently covered GHGRP facilities, as well as industrial facilities and operations that are not currently covered because they meet all or some of their energy needs with purchased power. Further, to avoid confusion, we recommend that EPA add these requirements to the general provision governing reporting by all facilities,[237] rather than creating a separate source category for energy consumption.[238]

To set thresholds for inclusion of facilities not already reporting emissions under the GHGRP, EPA could specify the total level of energy input over a certain time frame and/or the total capacity that would identify facilities roughly equivalent in size and function to facilities utilizing combustion-powered equipment otherwise required to report under the GHGRP. Specifically, for a facility with a source category that is listed in Table A–4 to subpart A and that is not already required to report emissions, EPA could establish a threshold to report energy consumption and energy attributes from each of its energy purchases, with the threshold being

equivalent to the minimum total energy input of any facility containing the same source category that is currently reporting under 40 C.F.R. § 98.2(a)(2) because it directly emits 25,000 metric tons or more of CO_2 equivalent from process emissions and the combustion of natural gas.[239] Facilities above this threshold would be required to report energy consumption and energy attributes from each of their energy purchases, as would any facility that is already reporting emissions. This approach is reasonable as it would not require burdensome new reporting for small facilities. It would allow EPA and potentially other stakeholders to analyze energy consumption from these facilities but avoid requiring the facilities to estimate indirect emissions, which could prove to be a complicated and unreliable metric for inclusion.

For any facility that does not contain a source category listed in either Table A–3 or Table A–4 to subpart A and that is not already required to report emissions, EPA could establish a two-part threshold to report energy consumption and energy attributes from each of its energy purchases. This threshold would be equivalent to: 1) the minimum total energy input of any facility that is currently reporting under 40 C.F.R. § 98.2(a)(3) because it directly emits 25,000 metric tons or more of CO_2 equivalent from process emissions and the combustion of natural gas; and 2) 30 MMBtu/hr of total capacity of energy-consuming equipment, consistent with 40 C.F.R. § 98.2(a)(3)(ii). Both components of the threshold would need to be met to trigger reporting requirements for a facility that does not contain a source category listed in either Table A–3 or Table A–4 to subpart A and is not already required to report emissions. All facilities that would be included under this framework would be required to report data on electricity and other energy purchases—whether those facilities are fully electrified or rely primarily on combustion or other energy purchases as energy sources. The additional reporting requirements would be reasonable in part because the reporting thresholds would be designed to limit applicability to facilities that are already reporting under the GHGRP or are comparable in size and function to such facilities. The required data elements themselves should be readily available in company records because energy or electricity purchases involve documented transactions.[240] Accordingly, the additional requirements would be reasonable, and therefore authorized undersection 114.

Footnotes

[237] See 40 C.F.R. § 98.3(c)(4).

[238] The requirements should not be limited to facilities containing sources from any "applicable source category," as the term is defined in 40 C.F.R. § 98.3(c)(4)(viii).

[239] EPA could list these source-category-specific thresholds in Table A–4.

[240] Cf 74 Fed. Reg. at 16,448, 16,480 (Apr. 10, 2009) (proposed GHG Reporting Rule, noting that facilities would be expected to retain these data on electricity purchases as part of routine financial records).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 30

Comment Excerpt: We recommend the broader approach: requiring reporting on energy consumption (including electricity purchases) from currently covered GHGRP facilities, as well as industrial facilities and operations that are not currently covered because they meet all or some of their energy needs with purchased power. Further, to avoid confusion, we recommend that EPA add these requirements to the general provision governing reporting by all facilities, see 40 C.F.R. § 98.3(c)(4), rather than creating a separate source category for energy consumption.[97]

To set thresholds for inclusion of facilities not already reporting emissions under the GHGRP, EPA could specify the total level of energy input over a certain timeframe and/or the total capacity that would identify facilities roughly equivalent in size and function to facilities utilizing combustion-powered equipment otherwise required to report under the GHG Reporting Rule. Specifically, for a facility with a source category that is listed in Table A–4 to subpart A and that is not already required to report emissions, EPA could establish a threshold to report energy consumption and energy attributes from each of its energy purchases, with the threshold being equivalent to the minimum total energy input of any facility containing the same source category that is currently reporting under 40 C.F.R. § 98.2(a)(2) because it directly emits 25,000 metric tons or more of CO_2 equivalent from process emissions and the combustion of natural gas.[98] Facilities above this threshold would be required to report energy consumption and energy attributes from each of their energy purchases, as would any facility that is already reporting emissions. This approach is reasonable as it would not require burdensome new reporting for small facilities. It would allow EPA and potentially other stakeholders to analyze energy consumption from these facilities but avoid requiring the facilities to estimate indirect emissions, which could prove to be a complicated and unreliable metric for inclusion. For any facility that does not contain a source category listed in either Table A–3 or Table A–4 to subpart A and that is not already required to report emissions, EPA could establish a two-part threshold to report energy consumption and energy attributes from each of its energy purchases, with the threshold being equivalent to: 1) the minimum total energy input of any facility that is currently reporting under 40 C.F.R. § 98.2(a)(3) because it directly emits 25,000 metric tons or more of CO_2 equivalent from process emissions and the combustion of natural gas; and 2) 30 MMBtu/hr of total capacity of energy-consuming equipment, consistent with 40 C.F.R. § 98.2(a)(3)(ii). Both components of the threshold would need to be met to trigger reporting requirements for a facility that does not contain a source category listed in either Table A–3 or Table A–4 to subpart A and is not already required to report emissions.

All facilities that that would be included under this framework would be required to report data on electricity and other energy purchases—whether those facilities are fully electrified or rely primarily on combustion or other energy purchases as energy sources. The additional reporting requirements would be reasonable in part because the reporting thresholds would be designed to limit applicability to facilities that are already reporting under the GHGRP or are comparable in size and function to such facilities. The required data elements themselves should be readily available in company records because energy or electricity purchases involve documented transactions. Cf. 74 Fed. Reg. 16448, 16,480 (Apr. 10, 2009) (proposed GHG Reporting Rule, noting that facilities would be expected to retain these data [on electricity purchases] as part of

routine financial records"). Accordingly, the additional requirements would be reasonable, and therefore authorized under section 114.

Footnotes

[97] The requirements should not be limited to facilities containing sources from any "applicable source category," as the term is defined in 40 C.F.R. § 98.3(c)(4)(viii).

[98] EPA could list these source-category-specific thresholds in Table A–4.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0321-A1
Comment Excerpt Number: 3

Comment Excerpt: Applicability should be limited to those facilities already subject to GHGRP reporting.

The Supplemental Notice discusses different applicability criteria considered by EPA for Subpart B reporting. INGAA supports the proposed approach, which is an applicability based on the established reporting status for a facility – *i.e.*, facilities subject to GHGRP reporting per Subpart A criteria would be required to add Subpart B reporting. Alternative options considered are not warranted and may only result in added complexity with little or no benefit. For example, EPA considered a lower annual emissions threshold for Subpart B reporting. Since such facilities are not integrated into the program, complexities would arise (*e.g.*, on applicability determinations) with no indication that the added information on energy usage provides any meaningful benefit. The GHGRP already includes GHG emissions reporting from electricity generation, and Subpart B reporting will provide insight into the demographics of how larger GHG emitters subject to GHGRP reporting contribute to associated energy usage. Further detail from smaller or other facilities not currently subject to GHGRP reporting is not warranted.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 5

Comment Excerpt: We urge EPA to consider including facilities of comparable size and function that may not meet the threshold for inclusion as direct emitters.[9] This broader approach would also better enable EPA to track trends in electrification (such as when a facility partially electrifies and falls below the reporting threshold) that would otherwise not be captured. We also urge EPA to require (when readily available) or at least provide for voluntary reporting on the attributes of purchased electricity and thermal energy products. We anticipate that certain facilities already are or will in the future track information about the attributes of the energy they consume (*e.g.*, renewable energy credits), and we encourage EPA to collect this data when it is available.

Footnotes

[9] EDF Comments on Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule, 87 Fed. Reg. 36,920 at 79 (Oct. 6, 2022), https://blogs.edf.org/energyexchange/files/2022/10/EDF-GHGRP-Comments-10.6.2022-Final.pdf.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Class of '85 Regulatory Response Group
Commenter Type: Other
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0329-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA has determined that the CO_2e thresholds for reporting should not include the indirect emissions at a facility associated with purchased metered electricity or thermal energy products.[6] EPA's analysis showed that this type of reporting threshold would, at a minimum, add 4,000 reporters and, at a maximum, "increase the number of reporters by nearly an order of magnitude."[7] The Class of '85 agrees with EPA's decision not to propose such a requirement as it would impose reporting burdens on a substantial number of additional facilities with direct emissions that are below the threshold.

If EPA, at a later time, considers revising the GHG Reporting Rule to require facilities to include indirect emissions in calculating whether they meet the threshold for reporting, then the CO_2e reporting thresholds should be increased to account for the addition of such indirect emissions. To do otherwise would unnecessarily impose the GHG reporting burden on facilities with lower direct GHG emissions.

Footnotes

[6] Id. at 32,890.

[7] Id.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0293-A1
Comment Excerpt Number: 5
Supportive Commenters: Texas Pipeline Association (TPA)

Comment Excerpt: Any final Subpart B rules should include a usage threshold below which a meter would not be covered. A company in the pipeline industry is likely to have many thousands of meters measuring extremely low amounts of energy usage. Examples of metered devices that have very low energy usage include rectifiers (used for cathodic protection) and motor-operated valves. As noted above, Subpart B as currently configured contemplates an extensive set of burdensome and detailed requirements that would apply to every meter covered by the rule. This being so, it is imperative that meters reflecting de minimis energy usage be excluded from coverage. This would prevent reporting companies from having to satisfy extensive requirements for thousands of low- level meters, which would impose burdens far outweighing any benefits that might be gained by EPA. It would also keep Subpart B in line with the traditional approach of the GHG reporting program, which has been to focus reporting requirements on large sources of emissions. In this regard we note EPA's stated basis for setting the reporting threshold at 25,000 tpy in the initial GHG reporting program rule:

The lower threshold alternatives that we considered were 1,000 metric tons of CO_2e per year, and 10,000 metric tons of CO_2e per year. At proposal, we explained that we did not select either of these thresholds because although both broaden national emissions coverage, they do so by disproportionately increasing the number of affected facilities…. [W] e remain convinced that the 1,000 metric ton CO_2e/year threshold would increase the number of reporters by an order of magnitude, thus changing the focus of the program from large to small emitters and imposing reporting costs on tens of thousands of small businesses that in total would amount to less than 10 percent of national GHG emissions. Our analysis indicates that a 10,000 metric ton CO_2e/yr threshold would approximately double the number of reporters, but would only increase national emissions coverage by one percent…. While some proposals … contain a 10,000 metric ton threshold for reporting, EPA concluded for policy evaluation purposes, the 25,000 metric ton threshold more effectively targets large industrial emitters and suppliers, covers approximately 85 percent of U.S. emissions, and minimizes the burden on smaller facilities…. EPA has determined that the selected 25,000 metric ton CO_2e threshold will cover many of the types of facilities and suppliers typically regulated under the CAA, while appropriately balancing emission coverage and burden. At this threshold, EPA will be able to evaluate the effects of a number of options and policies that could address GHG emissions without placing an undue burden on a large number of smaller facilities and sources.[6]

We believe those views continue to be well founded, and as applied to the current proposal would strongly counsel against application of the rule's burdens to every single meter reflecting any energy use, regardless of how miniscule. It is thus essential that any final Subpart B rule contain a usage threshold below which a meter is excluded from coverage.

Footnotes

[6]74 Fed. Reg. 56272-73 (Oct. 30, 2009).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 22

Comment Excerpt: GPA offers conditional support of limiting Subpart B to "anyway" GHGRP reporters; however, additional threshold options must be considered to minimize reporter burden. EPA only considered three threshold options (1) no threshold; (2) "anyway" GHGRP reporters; and (3) CO_2e threshold for indirect emissions. EPA did not consider thresholds for small usage meters.[35] First, EPA should exempt facilities from reporting under Subpart B if usage across all meters is small. EPA applies reporting thresholds for direct emissions to minimize burden, and it is arbitrary and capricious for EPA to "do away" with the concept of applying reporting thresholds for energy usage. For example, a facility may be subject to reporting but use very minimal electricity. There is no valid reason to subject such a facility to the onerous requirements of Subpart B for a very small amount of purchased electricity usage.

For basin-level reporters, EPA should consider simply allowing facility-wide (*i.e.*, basin- wide) usage, and remove any per-meter requirements. Because all other energy use data (*e.g.*, Subpart W fuel combustion) will be at the basin level, EPA would have no reasonable use for locational granularity for purchased energy beyond basin level. Additionally, for the reasons articulated throughout this letter, nearly all per-meter data that EPA requests is unnecessary, overly burdensome, and/or not executable.

EPA must also consider exempting small usage meters from reporting. For example, if a facility has larger use meter(s) but also has small use meter(s), the small use meters should be exempt from Subpart B. EPA does not need data, let alone quality assurances, on small use meters that have a negligible impact on a facility's energy intensity. In conjunction with these exemptions (or even if EPA does not allow reasonable facility and meter applicability thresholds in Subpart B), EPA should at least allow aggregation of small use meters. For example, small use meters could be aggregated for reporting, just as fuel burning equipment is allowed to be aggregated under Subpart C. EPA does not need intense quality assurance or detailed records for small use meters that have little impact on a facility's energy intensity.

Footnotes

[35] TSD, "Options for Reporting Thresholds."

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Stephanie Engwall
Commenter Affiliation: Atmos Energy Corporation
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0328-A1
Comment Excerpt Number: 10

Comment Excerpt: EPA should exclude the natural gas distribution and onshore natural gas transmission industry segments from Subpart B, but if it does not do so, it is imperative the Agency adopt a usage threshold below which a meter would not be covered by Subpart B. If meters reflecting de minimis energy usage are excluded from Subpart B coverage, it would prevent reporting companies from having to satisfy extensive requirements for thousands of low-level meters. This would align with the traditional Reporting Rule approach of targeting larger emissions sources and would avoid what is likely the unintended consequence of requiring natural gas distribution and onshore natural gas transmission pipeline facilities to report voluminous data on low-level energy use by field equipment. Setting a usage threshold for Subpart B would lessen this unintentional burden.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.5 Comments on applicability to subpart W (Petroleum and Natural Gas) facilities as defined in 98.238

Commenter Name: Stephanie Engwall
Commenter Affiliation: Atmos Energy Corporation
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0328-A1
Comment Excerpt Number: 1

Comment Excerpt: The natural gas distribution and onshore natural gas transmission pipeline segments should not be required to also report their energy consumption under the proposed Subpart B. Distributors already report greenhouse gas emissions under the Reporting Rule. The burden associated with these additional reporting requirements is excessive and needless for natural gas distribution and onshore natural gas transmission pipeline facilities, because the primary source of emissions is fugitive leaks of methane from the distribution pipeline systems and blowdowns from the transmission pipeline systems.[1]

The Proposed Rule requests that facilities "simply report the quantity of purchased electricity and purchased thermal energy products during the reporting year"[2] and asserts that this information would "allow the Agency to undertake a more thorough and holistic evaluation of

how to utilize its authority under the CAA [].”[3] EPA also seeks comment on its “assessment that the incremental reporting burden would be minimal.”[4]

EPA seriously underestimates the excessive burden associated with reporting this additional information. Atmos Energy operates over 79,000 miles of distribution and transmission pipelines.[5] The majority of these pipelines, which have the potential to corrode over time, employ “cathodic protection” to mitigate the risk of corrosion and maintain pipeline integrity. Atmos Energy utilizes cathodic protection to shift the potential of the metal to a non-corroding state by applying a small electric current to the pipe supplied by an external power source. The Proposed Rule would require Atmos Energy to report the power it purchases and uses to protect its tens of thousands of miles of pipeline as measured by thousands of electrical meters. Enterprise wide, Atmos Energy has over 5,200 electricity meters, and over 94% are associated with field equipment. Such an undertaking is far from “simple.”

The burden associated with the Proposed Rule is not offset by countervailing benefits. Such information is unlikely to materially inform EPA’s understanding of greenhouse gas emissions from the natural gas distribution and onshore natural gas transmission pipeline industry segments. EPA only requires the natural gas distribution industry segment to report fugitive emissions[6] and the onshore natural gas transmission pipeline industry segment to report blowdowns[7] under the Reporting Rule because—unlike other petroleum and natural gas facilities that may include stationary combustion, gas processing, and routine venting or flaring—these segments generally do not include material point sources of greenhouse gas emissions. Thus, while Atmos Energy supports EPA’s effort to obtain a better understanding of energy intensity and a complete picture of energy needs, we do not view Subpart B as accomplishing these goals.

Footnotes

[1] EPA (2023) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021. U.S. Environmental Protection Agency, EPA 430-R-23-002: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2021

[2] 88 Fed. Reg. 32,852, 32,890 (May 22, 2023).

[3] Id. at 32,887.

[4] Id. at 32,891.

[5] Atmos Energy Corporation Analyst Update June 2023: https://www.investors.atmosenergy.com/overview/default.aspx.

[6] 40 C.F.R. § 98.232(i)(1) – (6).

[7] 40 C.F.R. § 98.232(m).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: James D.W. Roush
Commenter Affiliation: CMS Energy Corporation
Commenter Type: Industry Trade Association
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0307-A1
Comment Excerpt Number: 8

Comment Excerpt: Consumers Energy echoes AGA's comment that EPA should exempt Natural Gas Distribution Facilities from Subpart B reporting requirements. Our natural gas distribution system has over 28,000 miles of distribution pipeline and is subject to Subpart W reporting for this segment. Under this proposed subpart, Consumers Energy will have numerous electric meters to report and may have multiple electricity providers across our natural gas distribution system to gather data from for reporting. The data/information collection, documentation and reporting burdens associated with numerous meters within this subpart however would not be insignificant.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 7

Comment Excerpt: While in no way conceding EPA's statutory authority to require the reporting of energy consumption data as proposed in Subpart B, the Associations strongly urge EPA to exempt natural gas distribution facilities, if it opts to implement such a requirement in a final rule. Natural gas distribution facilities possess unique characteristics and attributes that make them unique when compared to typical GHGRP facilities. EPA recognized these unique characteristics and attributes when it adopted a specific definition in Subpart W for "natural gas distribution" facilities that differs from the general definition of "facility" provided in Subpart A.

The data sought to be collected under new Subpart B - electricity consumption – along a natural gas distribution system is relatively minor, with the potential for multiple electricity providers spanning across a utility's service territory. Billing cycles, usage periods, and other variables may vary by provider. As a result, this will likely result in significant complexity and administrative burden for natural gas utilities to gather multiple small bills and determine which portions of those bills are allocated to the natural gas distribution facility, as defined in Subpart W, to capture and report small amounts of electricity usage.[23] The requirements in Subpart B to develop a MEMP would also create additional administrative burdens on natural gas LDCs, with minimal benefits to EPA or the public. The Associations support the Interstate Natural Gas Association of America's ("INGAA's") request that the onshore natural gas segment also be exempt from the Subpart B reporting requirements.

Footnotes

[23] Further complicating the allocation of energy costs at a natural gas facility required to report under Subpart W, many of these facilities are jointly utilized by multiple utilities (*e.g.*, gas and electric, gas and water, or gas, electric, and water).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0321-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA should exempt natural gas transmission pipeline facilities from Subpart B requirements for energy consumption (*i.e.*, purchased electricity or thermal energy). Purchased electricity is minimal for this segment and multi-state geographical coverage of interstate transmission pipelines will add complexity not contemplated by EPA.

Under Subpart W, onshore natural gas transmission pipelines report blowdown emissions if pipeline blowdown emissions exceed the 25,000 metric ton CO_2e threshold, with 44 transmission pipelines subject to GHGRP reporting in 2021. A pipeline "facility" is unconventional relative to typical Clean Air Act facility definitions. Interstate natural gas transmission pipelines are operated by INGAA members, and the system spans the continental U.S., totaling over 200,000 miles of pipeline. An individual pipeline is typically hundreds of miles long and can traverse several states. This expansive geographical coverage includes very limited use of electricity. For example, purchased electricity may be used for cathodic protection of the pipeline and at metering and regulating stations along the pipeline.

Electricity consumption along a pipeline is relatively minor, and interstate pipelines span vast areas that encompass multiple electricity providers through numerous states. Billing cycles or usage periods may vary by provider. This will result in significant complexity for gathering multiple small bills across different operational areas to capture small amounts of electricity usage. Added complexity would arise from addressing Subpart B requirements such as developing a Metered Energy and Monitoring Plan (MEMP). Since electric use and associated emissions are minimal, the onshore natural gas transmission pipeline segment should be exempt from Subpart B reporting requirements.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 23

Comment Excerpt: As an additional option to minimize burden for midstream reporters, EPA should distinguish data required for actual operating facilities (such as gathering and boosting compressor stations) from non-facility "basin" operations such as field pipeline cathodic production. Specifically, EPA should only require reporting under Subpart B for natural gas processing plants, gathering and boosting compressor stations, and transmission compressor stations. This will account for 95%+ of usage for midstream and comprise less than 5% of the records. This aligns with part 98 philosophy of capturing the majority (not all) of emissions and minimizing burden.

EPA should at the very least exempt transmission pipelines from Subpart B. This facility type is subject to Subpart W. Transmission pipelines have a small amount of electricity usage, which is primarily for tiny rectifiers and cathodic protection.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 27

Comment Excerpt: The proposed recordkeeping, QA/QC and reporting requirements as proposed in this supplemental rulemaking are extremely burdensome for oil and natural gas operations and could result in disincentivizing site electrification. For the oil and natural gas operations that cover a large geographical area consisting of numerous assets, such as onshore oil and gas production and onshore gathering and boosting where the facility encompasses assets across an entire American Association of Petroleum Geologists (AAPG) basin, the number of energy providers and the number of individual meters can be quite significant. Providing documentation on a meter-by-meter basis, including billing statements, would result in an extremely burdensome reporting process, requiring uploading billing statements for hundreds, if not thousands, of meters for individual reporting entities. This is an excessive reporting requirement given that it is likely that the vast majority of meters used in the upstream oil and natural gas segment are for very small energy consuming sites, are not owned or operated by the energy purchaser, and do not serve a specific purpose beyond the reported values. Additionally, imposing these extremely burdensome recordkeeping, reporting and QA/QC requirements for

energy purchasers could ultimately result in disincentivizing site electrification, which would be in contrast to the current Administration's drive toward electrification.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 28

Comment Excerpt: Separating energy consumption between reporting segments (*e.g.*, onshore production versus gathering and boosting or gas processing) will be particularly challenging for large integrated operations. The Industry Trades recommend allowing operators subject to Subpart W reporting to report all energy consumption for all reportable Subpart W operations within a single AAPG hydrocarbon basin. Many oil and natural gas operators in the U.S. report both onshore production and gathering and boosting within the same basin and across multiple basins. The proposed data requirements under Subpart B would represent a significant and burdensome data collection effort to not only collect the meter-level data for these multi-asset facilities, but to also then separate the data between the onshore production, gathering/boosting and other GHG reporting segments. In many instances, it is not as simple as a single meter serving a single facility or reporting segment - there are meters recording data across the entire value chain with overlap between the segments - this further complicates a reporters' ability to divide that energy consumption between reporting segments. The Industry Trades request that EPA allow operators who are subject to reporting under Subpart W to report ALL consolidated energy consumption from Subpart W operations within the AAPG basin. If required to report energy by Subpart W source category (*i.e.*, by segment), the Industry Trades request EPA to allow estimation of energy usage between Subpart W facilities, to account for the need to allocate between different facility types (*e.g.*, onshore production, gathering and boosting, etc.) where meters cover energy use across the value chain.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 36

Comment Excerpt: The Industry Trades recommend that EPA allow reporters subject to reporting under Subpart W to report energy consumption for all GHG reporting activities within a single AAPG hydrocarbon basin without direct upload of billing statements. The Subpart W operations are often interconnected, and many operators report under production, gas processing and gathering and boosting segments. In addition, electric meters may service an entire basin, a single site, or multiple sites. In order to report at a source category level as defined in Subpart W, operators would need to allocate metered electricity to a single site and then reallocate back to a segment. This would be extremely burdensome and does not meaningfully improve the quality of reported data. This gives reporters the ability to maintain relevant energy consumption information in existing Greenhouse Gas Monitoring Plans, as already required in 40 CFR 98.3(g)(5) and other relevant subparts. As currently codified, this information would be available upon request by EPA.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Angie Burkhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0320-A1
Comment Excerpt Number: 3

Comment Excerpt: Our members that currently report under Subpart W may have thousands of wells across large geographical areas (including many remote areas) with literally thousands of energy meters and hundreds of energy providers associated with those facilities. The collection of specific meter-by- meter information and accuracy, data collection process, recordkeeping and reporting along with other additional requirements under Subpart B is excessive and unnecessary. We don't think EPA has adequately addressed the cost impacts and we think that EPA lacks authority to collect Scope 2 emissions for energy consumption as proposed.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Angie Burkhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0320-A1
Comment Excerpt Number: 4

Comment Excerpt: In our initial comments (dated October 6, 2022) on EPA's 2022 proposed rule, 87 Fed. Reg. 36920, June 21, 2022, we pointed out that our members are subject to 40 CFR

Part 98, Subpart W (Petroleum and Natural Gas). EPA's own estimates in the 2022 proposed rule showed that 86% of the cost impacts were attributed to the amendments to Subpart W[1] EPA's limited estimated costs for the Supplemental Proposed Rule places additional requirements on Subpart W reporters that increase the costs an additional 22% ($2.6 million) for initial labor cost in RY 2025, a 34% ($2.6 million) increase for labor costs for RY 2026-27, and an 84% increase ($2.7 million) in capital and O&M costs.

Under Subpart B, EPA estimates that the additional costs for all reporters (Subpart W, DD, HH, II, OO, TT, WW, XX YY and ZZ) would increase labor costs by 76% ($8.8 million) for RY 2025, an additional 61% ($4.7 million) increase in labor costs for RY 2026-27, and approximately $500,000 increase in capital and O&M costs. However, EPA does not provide any estimates on how Subpart B costs are attributed to Subpart W reporters. As previously stated, we think Subpart B requirements would be a significant (See item II above) undertaking for Subpart W reporters. The collection of specific meter-by-meter information and accuracy, data collection process, recordkeeping and reporting along with other additional requirements under Subpart B is excessive and unnecessary. We believe EPA has grossly underestimated the financial impact.

In Section VIII of the Supplemental Proposed Rule, EPA states under Executive Order 13211 (Actions That Significantly Affect Energy Supply, Distribution, or Use) that the Supplemental Proposed Rule is not a "significant energy action" and is not anticipated to add significant burdens for existing reporters or to impact the supply, distribution, or use of energy. However, EPA provides no detailed cost information to support that determination and no detailed cost impact information was found in the docket. We request EPA evaluate the cost impacts of Subpart B on Subpart W reporters and make that information available for public review and comment prior to finalizing the Supplemental Proposed Rule. Additionally, we request EPA provide a cumulative cost impact analysis of the collective rules described in Section I above. Collectively, we think these costs are significant.

Footnotes

[1] 87 Fed. Reg. 36920 (June 21, 2022).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.6 Comments regarding metering, monitoring, and standards for purchased energy transactions

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 17

Comment Excerpt: The proposed requirement for covered facilities to establish and comply with a detailed Metered Energy Monitoring Plan (MEMP) goes well beyond the scope of what

would be needed to implement the Subpart B provisions, even if they remain in the final regulation against the Association's recommendation above.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 8

Comment Excerpt: The end-user cannot mandate the performance specifications (let alone repair) of equipment used and owned by the supplier. EPA has proposed to require that facilities certify that electricity meters conform to the C12.1–2022 Electric Meters—Code for Electricity Metering standard established by the American National Standards Institute ("ANSI") or with another standard that is at least as stringent as the ANSI standard.[21] If a meter does not comply with such a standard, the reporting entity would be required to ask the electricity service provider to install a conforming meter.[22]

EPA does not have authority pursuant to CAA § 114 to impose this requirement. Section 114 addresses information related to air emissions. A metering requirement does not fall into that category. Indeed, section 114 specifies the type of equipment and information EPA may seek. It says that EPA may require maintenance of records and the provision of reports.[23] EPA can require the use of monitoring equipment, require the submission of compliance certifications, and require "records on control equipment parameters, production variables or other indirect data when direct monitoring of emissions is impractical."[24] None of these things include metering equipment owned by the electricity provider. At the very least, EPA should explain what it believes is the source of its authority to enact this requirement. EPA should also explain how it expects reporters will go about opening and renegotiating contracts to ensure compliance with these meter performance standards, and EPA should further explain who the agency believes will pay for the equipment upgrades it envisions. Absent these explanations, EPA will have failed to provide an adequate record in support of this aspect of the Proposed Rule.

Additionally, for thermal meters, the Proposed Rule states that "[i]f the audit indicates that the meter is producing readings with errors greater than specified by § 98.3(i)(2) or (3), the meter must be repaired or replaced and retested to demonstrate compliance with the specifications at § 98.3(i)(2) or (3)." GPA members have no authority to repair meters owned by third parties. EPA cannot impose legal obligations on parties that have no manner in which to comply with them.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.24(a)(5)(ii)(iii), 98.24(a)(5)(iii)(A)(B)(C), 98.24(b), 98.24(b)(3), and 98.24(c) be removed, for the reason of: end-user cannot mandate performance specifications.]

Footnotes

[21] 88 Fed. Reg. at 32,890.

[22] Id.

[23] 42 U.S.C. § 7414(1)(A)-(B).

[24] Id. § 7414(C)-(F).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: James D.W. Roush
Commenter Affiliation: CMS Energy Corporation
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0307-A1
Comment Excerpt Number: 4

Comment Excerpt: Pursuant to § 98.24, subject facilities would need to develop a written Metered Energy Monitoring Plan (MEMP). The MEMP must include one of the potential outcomes listed in paragraphs (a)(5)(i) through (iii) of this section for each electricity meter serving the facility. Specific to (a)(5)(i), we believe that stating the "manufacturer's certification …" "with a copy of the manufacturer's technical data" sheet is confusing and burdensome. The disclosure on the manufacturer's technical data sheet of the meter's accuracy specifications is adequate documentation to obtain/retain for this compliance demonstration; mention of a manufacturer's certification with a technical data sheet implies that a separate statement from the meter manufacturer would be necessary to confirm that the meter accuracy information disclosed on the technical data sheet conforms to the accuracy specifications. This certification would be burdensome to obtain, and not necessary if the technical data sheet with this information is supplied. We have a considerable interest in accurate metering, and we have seen no evidence that further meter verification is necessary. Thus, the language regarding manufacturer's certification in § 98.24(a)(5)(i) should be deleted.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: James D.W. Roush
Commenter Affiliation: CMS Energy Corporation
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0307-A1
Comment Excerpt Number: 7

Comment Excerpt: § 98.24(b) Quality assurance for purchased electricity monitoring: EPA is proposing that electricity meters subject to this subpart must conform to the accuracy specifications required by the voluntary standard for electricity metering accuracy under the ANSI standards C12.1–2022 Electric Meters—Code for Electricity Metering, or with another consensus standard having accuracy specifications at least as stringent as the cited ANSI standard. Pursuant to the Michigan Public Service Commission rules, R 460.3607 stipulates "Watthour meters that are to be used for measuring electrical quantities supplied must conform to ANSI C12.1 or C12.20 specifications…." It's our understanding that ANSI C12.20 was recently merged with ANSI C12.1 to become ANSI C12.1- 2022, however many of the manufacturer's technical documentation for existing electric meters reference conformance with quality assurance standard ANSI C12.20. For the existing meters in service, in order for facilities to have a transparent understanding that the technical specification documentation provided demonstrates conformance with the accuracy specifications, it would be our recommendation to also add "ANSI C12.20 – Electricity Meters – 0.2 and 0.5 Accuracy Classes" to this paragraph and the incorporated by reference section in § 98.7.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 31

Comment Excerpt: The Industry Trades believe energy purchasers should not be held responsible for accuracy attestations on behalf of energy providers. If an electricity purchaser does not purchase, maintain or monitor meters used for billing purposes, the burden of demonstrating that the meters meet the accuracy requirements of 40 CFR§ 98.24(b) should not fall upon the electricity purchaser; rather, the electricity provider should be responsible for this demonstration. The Industry Trades respectfully recommend removing the proposed requirements in 40 CFR § 98.24(a)(5) and (b) and requiring energy providers to report these certifications.

Alternatively, the Industry Trades recommend that the certification requirements found in 40 CFR § 98.24(a)(5) and (b) should be provided by each electricity provider for all meters in the service area, rather than a certification on a meter-by-meter basis.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 33

Comment Excerpt: As proposed, 40 CFR § 98.24(a)(2) requires reporters to collect a meter identifier and a photograph of each meter included in the MEMP. Collecting this information from hundreds or thousands of remote well pads, pipelines, and compressor stations, many of which are unmanned, will be extremely time consuming and ultimately may not be accurate. In many (if not nearly all) instances, and as indicated above, electricity purchasers do not own nor control the meters in use at a site; those meters may be replaced or changed by the energy provider without any notice to the electricity purchaser. Therefore, not only is this requirement extremely time consuming for the reporters, it would also fail to meaningfully improve the quality of reported data and the reported information could become outdated without the knowledge of the reporter.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 41

Comment Excerpt: As proposed, Subpart B requires reporting metered thermal energy products as well as comprehensive auditing requirements for thermal energy meters.

It is the Industry Trades' position that the purchaser should not be required to provide the most recent accuracy audit; instead, that should fall to the energy provider as the owner of the meter.

The Industry Trades object to the proposed requirement that a purchaser must conduct the audit on a thermal meter system where purchasing agreements do not include provisions for periodic audits under 40 CFR 98.24(c). Regardless of who is responsible for an audit on a thermal meter system, the Industry Trades request that EPA clarify minimum requirements to be considered a "qualified metering specialist" under 98.24(c) and any restrictions to using in-house resources (*i.e.*, facility, energy provider, independent resources, etc.).

The Industry Trades request flexibility regarding the 5-year audit requirement for purchased thermal energy meters. As proposed, 98.24(c) states that if the audit has not been performed (or is older than 5 years old), the energy purchaser is to request an audit from the energy provider. However, this audit procedure can only be completed during a facility shut-down or plant

turnaround. The Industry Trades request that EPA add language that allows for this audit to take place either every 5 years or during the next planned unit shut-down.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 49

Comment Excerpt: Meter level identification, auditing, accuracy and QA/QC requirements should not be incumbent upon the energy purchaser; instead, these requirements should apply to the meter owner, which is the energy provider. The Industry Trades are concerned that the monitoring and QA/QC requirements proposed in 40 CFR § 98.24, and the reporting requirements in 40 CFR § 98.26, will be particularly burdensome given that many of the proposed accuracy and QA/QC requirements would be the responsibility of the energy purchaser rather than the energy provider, despite the fact the energy purchaser does not own, maintain or control the meters. Placing the responsibility for the proposed data requirements on the energy purchaser is inappropriate because it is the energy providers (such as electric utilities) that own and operate the energy meters and are responsible for their accuracy. Further, it is not uncommon for energy providers to change or replace meters without informing the electricity purchaser; therefore, reporting any meter-specific data supplied by an energy purchaser could become inaccurate without the knowledge of the purchaser. Similarly, the energy purchaser does not have access to documentation that the meters conform to ANSI standards, and likely does not have the ability to request that information from the energy provider.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 50

Comment Excerpt: EPA is seeking comment on existing industry standards for assessing the accuracy of electric and thermal energy monitoring systems, the frequency of audits of these systems, and the accuracy specification(s) used for thermal energy product metering systems. Consistent with the Industry Trades' position on the meter-level QA/QC and accuracy

requirements, the Industry Trades' members are not generally energy providers and cannot comment on the accuracy of electrical and thermal energy monitoring systems. However, it is the Industry Trades' position that any audits of these electric and thermal energy monitoring systems be performed only during a planned facility shutdown.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0321-A1
Comment Excerpt Number: 4

Comment Excerpt: The Metered Energy and Monitoring Plan (MEMP) and other recordkeeping and reporting requirements should ensure operators are not responsible for the energy provider's equipment.

The requirements for the MEMP, which is required under § 98.24, and other reporting and recordkeeping should be streamlined to exclude equipment (*e.g.*, electric meter) that is the responsibility of the energy provider. Pipeline operators should not be responsible for potential data quality assurance issuances that could be associated with electric meters that the operator does not own, operate, or maintain.

For example, the facility operator can maintain billing records and address other MEMP criteria in § 98.24(a)(1) – (4). However, the facility operator should not be required to ensure accuracy specifications, certification, or quality assurance for meters owned and maintained by the electricity provider. To address this, § 98.24(a)(5) – (8), § 98.24(b) and § 98.24(c) should be removed. Similarly, records for certifications, quality assurance, and maintenance required in § 98.27(b) and (c) should be removed because the facility operator does not own, operate, or maintain the subject meter.

Electric meters are generally manufactured and installed consistent with defined standards. Meters are typically highly accurate, especially when considering the uncertainty associated with many data elements and emission estimates included in GHGRP reporting. If EPA is concerned about equipment integrity, requirements should be proposed for the responsible energy provider (*e.g.*, typically an electric company). For example, criteria in sections of INGAA comments recommended for removal from natural gas transmission pipeline facilities could, instead, be assigned to the responsible energy provider. A facility operator should not be held responsible for equipment, maintenance, certification, etc. activities for equipment that they do not own, operate or maintain.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Leslie Ritts
Commenter Affiliation: National Environmental Development Associations Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0213-A1
Comment Excerpt Number: 7

Comment Excerpt: NEDA/CAP also submits, in response to the agency's RFC, that EPA is mistaken about the ease of converting GHGs from electricity bills and metering that the agency believes most companies already maintain. While monthly energy consumption generally can be reported reliably based on metering by electric providers, not all regulated manufacturing facilities have metering—particularly if they have long-term purchase agreements with utilities and/or cogenerators or other providers that are not based on metering. It also is not clear to NEDA/CAP that metering is necessarily a good surrogate for secondary GHGs associated with particular processes and that it is at best, a crude representation of Scope 2 emissions.

With regard to the agency's goal of collecting information on the "source" of energy that a source consumes, NEDA/CAP reminds the EPA to recognize that it is impossible to derive the energy sources of electricity transmitted to public utilities from regional transmission organizations on the electrical grid. U.S. electrical transmission is based on the "lowest price bid" of power bid into the regional transmission organizations on the night before it is transmitted. Thus, customers not only will not know "where" the electricity they are buying comes from, they are unlikely to know whether such electricity or thermal products come from solar or wind sources. Imposing a burden on a regional transmission organization (RTO) to provide that information to their customers—let alone report it to the agency themselves—likely would interfere with the RTO's critical transmission functions.

Finally, in response to the RFC regarding existing monitoring and recordkeeping systems that are already in place for purchased energy transactions and/or GHG emissions, none currently exist to our knowledge and in the future, might depend on the particular industry and its RTO.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0293-A1
Comment Excerpt Number: 4
Supportive Commenters: Texas Pipeline Association (TPA)

Comment Excerpt: The proposed Metered Energy Monitoring Plan (MEMP) and related quality assurance requirements are unduly burdensome, particularly as applied to companies whose energy usage is measured by a large number of meters. Proposed Subpart B would impose an onerous set of requirements on reporting companies through the requirement that companies develop and follow a detailed MEMP for purchased electricity and thermal energy products. See 40 CFR § 98.24 (proposed). In particular, companies would find it extremely time consuming and expensive to comply with currently proposed MEMP provisions that would require, inter alia:

- Reporting of the identifier of each meter shown on billing statements with a description of the portions of the facility served by the meter;
- Photographs of each meter's identifier, manufacturer's name, and model number;
- A statement of the billing frequency for each meter;
- Confirmation that each individual meter conforms to certain accuracy specifications;
- Determination that each individual meter meets consensus standards by one of three methods, which would require (1) identifying the manufacturer and model number of the meter, obtaining copies of the meter's technical reference guide or technical data sheets, and providing photographs of each meter along with copies of technical data documentation from the manufacturer showing conformance with specified requirements; (2) obtaining certifications from electricity delivery service providers who own the meters that the meters conform to prescribed accuracy specifications; and/or (3) requesting that
- providers owning the meters replace the meters with new equipment that meets accuracy specifications; and
- A requirement that companies contact the energy delivery service provider of each purchased thermal energy product to request a copy of the most recent audit of the accuracy of each meter referenced in the purchasing agreement.

Complying with a long and detailed set of requirements such as these may be workable for a particular industrial facility that has a small number of meters at a single location. But these requirements are not workable, and in fact are unreasonably onerous, for companies such as pipeline operators whose energy consumption is measured by a vast number of meters spread across the country. Not only would fulfillment of the proposed requirements be unduly onerous, the difficulties for reporting companies would be compounded by the fact that, in many cases, a reporting company will have no control over or responsibility for the meters in question. Indeed, a meter could be replaced at any time by the service provider, with no notice to the reporting company. The logistical difficulties involved in tracking an extremely large group of meters, including those owned and operated by a third party, counsel against finalization of the detailed and complex reporting requirements currently being proposed for meters in Subpart B. Pipeline companies in particular have thousands of meters that they would be expected to track, even though they have no control over the operation or maintenance of those meters. Requiring detailed documentation on meters that a company has no control over and can be replaced at any time with no notice would be extremely difficult and such a requirement would be unnecessarily burdensome.

In addition, the MEMP requirements do not properly account for the realities of the electricity marketplace. With respect to purchased electricity, meters are usually owned by someone other than the consumer, *e.g.*, the electric company; in deregulated markets such as Texas, the meter may not even be owned by the electric company but rather by a third-party electricity distributor. The MEMP would make energy purchasers responsible for obtaining data from third parties who may not be willing to provide it at all, may not provide it in a timely manner, or may not provide it accurately or completely. The purchaser could not compel the third party to provide the required information, meaning that the purchaser would run the risk of immediate noncompliance with MEMP requirements through no fault of its own.

The proposed requirement that each meter meet ANSI accuracy standards poses another problem. Under proposed § 98.24(b)(3), if a reporting company determined that a meter does not conform to prescribed accuracy specifications, the company would have to submit to the electricity service provider that owns the meter a request that the meter be replaced by a meter that meets those accuracy specifications. But the parties may already have an agreement in place that allows the meter to be one that does not meet ANSI standards. The electricity service provider may not agree to replace the meter and could not be forced to do so by the purchaser. And if the provider did agree, it would likely impose the cost of replacement upon the purchaser who requested the change. This would add both non-compliance risk on the part of the reporting company and substantial additional costs that would be incurred if a company had to pay to replace and install a large number of meters.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: S. Dear Schramm-Satayathum
Commenter Affiliation: Citizens Energy Group
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0298-A1
Comment Excerpt Number: 3

Comment Excerpt: Citizens acknowledges that EPA is correct in that, in most cases, monitoring and recordkeeping systems are already in place for purchased energy transactions (as purchasing agreements). In fact, for those energy providers in regulated states, monitoring and recordkeeping systems are a requirement and overseen by the utility regulating body, such as the IURC in Indiana.

For instance, in Indiana, purchasing agreements for electricity are regulated by IURC. The IURC regulations provide that watthour meters must not have an error of greater than three percent (3%) at low-load or two percent (2%) average and must be tested every 16 years. (See, for example 170 IAC 4-1-10).

However, EPA is proposing to shift the burden from the energy provider to the customer to ensure that electric meters owned by the service provider are accurate. Because these meters are not owned by the customer, in some cases by law, the customer is not permitted to inspect,

remove, or tamper with the equipment owned by these providers, including meters, valves, etc. Requiring a customer to inspect meters could result in a breach of the purchasing agreement with the energy provider, violate the Terms and Conditions of Service approved by the public utility commission (the IURC in Citizens' case) and may unnecessarily impose safety concerns and endanger the individual completing the inspection.

Arc flash hazards may be present where the meter is installed, and the customer may not be trained to protect themselves from the hazard. Further, access to the area may be restricted by the service provider to protect the customer and limit liability. The burden of this proposed regulation creates endangerment of personnel and provides no additional value.

With the increased frequency of inspection, calibration or audit may cause additional temporary loss of energy during the calibration or audit because meters would have to be offline. A utility may have to increase staff to fulfill the additional customer requirement, incurring additional and unnecessary costs – which will, in turn, impact rates. Citizens recommends exempting purchased energy billing meters from the data quality assurance requirements provided that the energy supplier and energy customer are not owned by subsidiaries or affiliates of the same company.

Simply put, the responsibility to ensure the meters meet the QA/QC requirements should lie with the meter owner, which is generally the energy provider, and not the purchaser of the service. Citizens recommends that the EPA revised the proposed rule, prior to final promulgation, to ensure that the responsibility for ensuring the accuracy of electric meters lies with the electricity service provider, not with the customer (that for purposes of the proposed Subpart B rulemaking is the affected party).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Patti Hershey
Commenter Affiliation: Lower Colorado River Authority Transmission Services Corporation (LCRA)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0303-A1
Comment Excerpt Number: 5

Comment Excerpt: The Proposed Rule requires that all companies develop a MEMP which would contain a great deal of detail about the meters used at its site. As recognized by EPA, the entity responsible for gathering and maintaining the information about meters under this Proposed Rule is not the entity that actually controls the meter. The ability to assemble such a plan is totally dependent on the customer service department of each electricity provider. Considering these are relatively small sources, it is safe to assume that their requests for information about the meter, its certification, and any future revisions will not be a high priority for the service provider.

It is not clear from the Proposed Rule when this MEMP would need to be completed and in place and how often it would need to be updated. For Subpart DD facilities, this MEMP could be voluminous, covering many separate meters. Additionally, the portfolio of transmission facilities owned by an operator is often fluid, with some being added and others being sold throughout the year. Keeping such a plan updated will be very difficult. It is critical for EPA to provide sufficient time to put such a plan in place. LCRA TSC suggests at least two years before this could be a compliance requirement.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0311-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA has proposed to require development of a written Metered Energy Monitoring Plan (MEMP) to include recordkeeping for electric meters. The reporter would be required to determine whether each electric meter conforms to ANSI or other consensus standard and maintain copies of certification, QA tests, and maintenance records. These activities and records are owned by the electricity distributor; obtaining – as well as providing - this documentation would be burdensome. Furthermore - in some circumstances - reporters would be required to "request that their electricity delivery service provider ensure any installed purchased electricity meter meets minimum accuracy requirements." **SIA proposes, if required, that the accuracy of electric meters be treated in the same way as the billing meters for natural gas in Subpart C.** That is, as all parties have an interest in ensuring that meters used for billing purposes are accurate, SIA proposes no special calibrations are required provided that the fuel supplier and the unit using the energy do not have any common owners and are not owned by subsidiaries or affiliates of the same company.

SIA proposes to insert the following as § 98.24 (d):

(d) Provided that the energy supplier and the unit purchasing the energy do not have any common owners and are not owned by subsidiaries or affiliates of the same company, quality assurance requirements in § 98.24 (b) and (c) and the related do not apply.

Accordingly, SIA proposes to amend § 98.24 (a)(5) as follows and to include (iv) as shown below:

(5) An indication of whether each electricity meter conforms to the accuracy specifications required by § 98.24(b). The MEMP must include one of the potential outcomes listed in paragraphs (a)(5)(i) through (iv) of this section for each electricity meter serving the facility:

(iv) If § 98.24(d) is applicable, a statement acknowledging that the energy supplier and the unit purchasing the energy do not have any common owners and are not owned by subsidiaries or affiliates of the same company.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 51

Comment Excerpt: EPA is also seeking comment on their understanding that monitoring and recordkeeping systems are already in place for purchased energy transactions and on EPA's assessment that the incremental reporting burden would be minimal. The Industry Trades believe that the recordkeeping and QA/QC requirements as proposed would be extremely burdensome for operations across large geographic areas, such as oil and natural gas operations.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 20

Comment Excerpt: The new requirement for a Metered Energy Monitoring Plan (MEMP) adds layers of complexity to a heretofore simple process of doing business. A facility that requires electricity enters into an agreement to purchase electricity from a utility or other provider; and pays for that electricity based on its usage as recorded by a meter that is supplied by the provider of that electricity. Under the proposed Subpart B, a facility would be required to perform the following additional tasks:

- Develop and maintain, a MEMP;
- Determine whether its meter complies with the requirements of Subpart B, and document same using either a certification from the manufacturer or the provider, or documentation that such certification could not be obtained;

- Describe the processes associated with "*procedures and methods that are used for quality assurance, maintenance, and repair*" of the meter;
- Revise the MEMP "*as needed to reflect changes in production processes, monitoring instrumentation, and quality assurance procedures; or to improve procedures for the maintenance and repair of monitoring systems to reduce the frequency of monitoring equipment downtime*"; and
- Request a replacement meter if the installed meter does not meet the quality assurance requirements of Subpart B.

See 88 Fed. Reg. 32924. These obligations impose a significant additional burden on the facility to document and develop information about a meter that the facility, in most cases, had no role in selecting or installing and has no expertise in its function. For these reasons, the Landfill Industry Commenters do not support the finalization of Subpart B in the Proposed Rule.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 10

Comment Excerpt: Many MEMP requirements are focused on intensive data perfection and proof of perfection instead of more appropriate information gathering. Many elements of the proposed MEMP appear to be in line with "Next Generation Compliance" provisions,[26] where EPA is asking for extensive proof of data collection perfection, such as example billing records and a picture of the meter (presumably to associate the meter with billing records) and proof of meter accuracy standards, etc. We remind EPA that GHGRP is a data collection rule for information purposes and not a compliance-oriented rule (such as NSPS OOOOa where emissions standards, controls, and monitoring requirements apply). This level of "data perfection" is not even required in the actual greenhouse gas emissions portions of the GHGRP. Additionally, EPA has not considered the resources and time that would be required to implement the provisions of the proposed MEMP on hundreds or thousands of electricity meters that a production or gathering reporter may have in a "facility" *(i.e.*, an entire basin). This rule is not an appropriate place to mandate extensive records just to prove that energy use data is good. EPA should consider that reporters pay money for purchased energy and energy providers collect money for purchased energy, and the reliability of the market is reason alone for EPA to consider this data to be sufficiently accurate without the MEMP.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.24(a) be removed, for the reason of: requirements inappropriate for a broad data collection rule.]

Footnotes

[26] https://www.epa.gov/compliance/next-generation-compliance.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 11

Comment Excerpt: Reporters cannot access or photograph many electricity meters. Reporters may simply not be allowed to access or photograph equipment that does not belong to them. End- users are commonly not allowed access to utility infrastructure, particularly electricity meters. For example, meters may be located at the top of utility poles. GPA members are not permitted to climb utility poles because the poles are not the property of GPA members. GPA members would need to rent a bucket truck to get up to the meter(s). For larger electricity loads, like meters for fractionators, the meters could be in a substation miles away. Even if the substation is near the facility, the substation is owned by the utility company and these meters will be behind a locked gate that GPA members do not have access to. In the cases where meters are accessible, collecting and maintaining on-file records of those meters would be a very difficult task and would become a compliance trap. As described elsewhere in our letter, GPA reporters have thousands of meters that are constantly being taken out of service or put in service or replaced, and ensuring GPA members have current pictures of several thousand meters would be incredibly burdensome.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.24(a)(2), 98.24(a)(5)(i), 98.24(b)(1) be removed, for the reason of: reporters cannot access or photograph many electricity meters.]

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 12

Comment Excerpt: The proposed requirement to include a "description of the portions of the facility served by the meter" is overly vague and burdensome. Without referring, in some cases, to electrical wiring diagrams, this would be an estimate of which general areas a meter might serve. This estimate/description would not ensure better monitoring, reporting, or recordkeeping on the facility's energy use data. Therefore, GPA is also requesting the removal of this requirement.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.24(a)(2) be removed, for the reason of: description is burdensome and non-informative.]

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 15

Comment Excerpt: EPA seeks information from reporters that GPA members simply do not know. EPA states, "We are seeking comment on existing industry standards for assessing the accuracy of electric and thermal energy monitoring systems, the frequency of audits of these systems, and the accuracy specification(s) used for thermal energy product metering systems." As noted above, GPA members have no expertise on this. This is equipment owned and operated by others.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Stephanie Engwall
Commenter Affiliation: Atmos Energy Corporation
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0328-A1
Comment Excerpt Number: 5

Comment Excerpt: Atmos Energy strongly urges EPA not to finalize the metered energy monitoring plan and the related quality assurance requirements (collectively, MEMP) for the natural gas distribution and onshore natural gas transmission pipeline industry segments. The MEMP requirements fundamentally misunderstand the scope of affected meters and the meter ownership structure in unregulated markets, like Texas. As a result, distribution companies

would be put in the untenable position of being required to submit documentation on meters that we do not control and that can be changed by the owners at any time with no notice. Companies may have no way to comply with the rule.

The Proposed Rule would require companies like Atmos Energy to provide a detailed MEMP for purchased electricity and electricity and thermal energy products, including: (i) reporting the identifier of each meter included on periodic billing statements with a description of the portions of the facility served by the meter and a photo showing the meter's identifier, manufacturer's name, and model number; (ii) a statement of the billing frequency for each meter; (iii) confirmation that each meter conforms to certain accuracy specifications; (iv) determining that each meter meets consensus standards by one of three methods; (v) contacting the energy delivery service provider of each purchased thermal energy product to request a copy of the most recent audit of the accuracy of each meter referenced in the purchasing agreement.

These requirements are untenable for natural gas distribution and onshore natural gas transmission pipeline companies because meter ownership varies, especially regionally. The MEMP requirements do not account for the different electricity markets in which we and other natural gas distribution and onshore natural gas transmission pipeline facilities operate. For example, in some areas a meter may be owned by an electric company, but in other areas (*e.g.*, a deregulated market, like Texas) the meter may be owned by a third-party distributor. Obtaining accurate, complete data from third parties on a timely basis may not be feasible and likely would result in noncompliance with MEMP requirements that is outside the distributors' control.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Stephanie Engwall
Commenter Affiliation: Atmos Energy Corporation
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0328-A1
Comment Excerpt Number: 8

Comment Excerpt: A natural gas distributor that does not own all of the meters in its system may no way to comply the proposed requirement for each meter to meet ANSI accuracy standards. Under the Proposed Rule, if a reporting company that finds that a meter does not conform to prescribed accuracy specifications, the company would be required to request that the meter be replaced with a meter that meets the accuracy specifications. But, there is no obligation for the meter-owner to comply with the request; indeed, the meter owner may even have an agreement in place that allows meters that do not meet ANSI standards. In such circumstances, the natural gas distributor would be without a way to achieve and maintain compliance with the rule.

The Proposed Rule fails to fully consider the magnitude of the compliance burden associated with the MEMP requirements. Even for the meters it does own, compliance with the Proposed

Rule would be excessively costly and time —for little to no progress toward EPA's stated goals of improving data completeness and understanding of greenhouse gas emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 7

Comment Excerpt: EPA should eliminate the requirement to create and maintain a Metered Energy Monitoring Plan ("MEMP"). For reasons unexplained, EPA proposes to require a new, additional monitoring plan under Subpart B instead of relying on, or adjusting, the existing requirement to have a monitoring plan.[16] To avoid duplication alone, EPA should eliminate most requirements of the MEMP. Beyond duplication concerns, the MEMP also includes requirements that would force operators to collect records on equipment they do not own. Even more problematic, the MEMP would require reporters to try to compel third parties to replace their equipment. These provisions are unworkable, and, as detailed below and summarized in Appendix B, the MEMP should be removed from Subpart B. If EPA does retain some version of the MEMP or MEMP requirements, GPA requests that EPA allow companies to develop a companywide MEMP to reduce the burden of these requirements, rather than requiring one plan per facility as proposed.

a. Reporters do not maintain records for equipment they do not own. Among other things, the MEMP would specify recordkeeping activities for electricity meters, "including an indication of whether the meter conforms to American National Standards Institute.[17] Facilities would be required to retain the results of all required certification and quality assurance tests referenced in the MEMP for all purchased electricity meters or thermal energy products meters.[18]

The Proposed Rule does not evaluate or even acknowledge a critical issue that will have major implications for potential compliance with the MEMP provisions: facilities such as those owned and operated by GPA members do not themselves own or control the meters that are subject to the rule. Electricity service providers are responsible for meters. Accordingly, the service providers are the only entities that reasonably have access to the meters and the information the Proposed Rule seeks to obtain. For instance, the service provider would be the only entity that will be familiar with the following information that would be required by the Proposed Rule:

- "Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all monitoring systems, flow meters, and other instrumentation used to collect the energy consumption data reported under this part."

- "Manufacturer's certification that the electricity meter model number conforms to the accuracy specifications required by § 98.24(b), with a copy of the associated manufacturer's technical data."
- The results of all required certification and quality assurance tests referenced in the MEMP for all purchased electricity or thermal energy product meters used to develop the energy consumption data reported under this part."
- "Maintenance records for all monitoring systems, flow meters, and other instrumentation used to provide data on consumption of purchased electricity or thermal energy products under this part."[19]

Because EPA has not evaluated any of the complications that will result from the disconnect between the Proposed Rule's requirements and equipment ownership and control, the agency has not provided a reasoned basis for its proposal. When an agency "fail[s] to consider an important aspect of the problem," its action is arbitrary and capricious[20] The ownership and control of meters renders much of the MEMP provisions unworkable for GPA members. EPA should substantially revise the Proposed Rule to provide appropriate relief for entities that do not own or control meters.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter,

(1) the proposed requirements at 98.24(a) be removed, for the reason of: to eliminate requirement to create and maintain a MEMP; and

(2) the proposed requirements at 98.24(a)(5)(i) 98.24(b)(1)(3), 98.24(c), and 98.27(b)(c) be removed, for the reason of: reporters do not maintain records for equipment they do not own.]

Footnotes

[16] 40 C.F.R. § 98.3(g)(5).

[17] 88 Fed. Reg. at 32,872.

[18] Id. at 32,891.

[19] Id. at 32,924 (proposing new § 98.24).

[20] Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 9

Comment Excerpt: Many MEMP requirements are duplicative of existing requirements. Facilities subject to reporting under the GHGRP are already required to develop and implement a "GHG Monitoring Plan" pursuant to 40 C.F.R. Part 98, Subpart A, 98.3 (g)(5) requirements.[25] Many aspects of the MEMP are duplicative of these existing requirements. EPA should simply make appropriate updates to the existing monitoring plan rule text to encompass energy use.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter,

(1) the proposed requirements at 98.24(a)(1) be removed, for the reason of: duplicative of 98.3(g)(5)(i)(A) Identification of positions of responsibility (*i.e.*, job titles) for collection of the emissions data;

(2) the proposed requirements at 98.24(a)(6) be removed, for the reason of: duplicative of 98.3(g)(5)(i)(B) Explanation of the processes and methods used to collect the necessary data for the GHG calculations;

(3) the proposed requirements at 98.24(a)(7) be removed, for the reason of: duplicative of 98.3(g)(5)(i)(C) Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems, flow meters, and other instrumentation used to provide data for the GHGs reported under this part;

(4) the proposed requirements at 98.24(a)(8) be removed, for the reason of: duplicative of 98.3(g)(5)(iii) The owner or operator shall revise the GHG Monitoring Plan as needed to reflect changes in production processes, monitoring instrumentation, and quality assurance procedures; or to improve procedures for the maintenance and repair of monitoring systems to reduce the frequency of monitoring equipment downtime; and

(5) the proposed requirements at 98.24(a)(9) be removed, for the reason of: duplicative of 98.3(g)(5)(iv) Upon request by the Administrator, the owner or operator shall make all information that is collected in conformance with the GHG Monitoring Plan available for review during an audit. Electronic storage of the information in the plan is permissible, provided that the information can be made available in hard copy upon request during an audit.]

Footnotes

[25] Duplicative requirements are described in Appendix B.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 43

Comment Excerpt: In 98.24(a)(6) and 98.26(j)(2), EPA is proposing that the reporter be responsible for developing a "clear procedure" and example of how measured data are converted to MMBtu. By putting the onus on the reporter to develop "clear procedures," the potential for a wide range in methods and results exists, thus calling into question the value and necessity of reporting thermal energy consumption. For example, there may be differences in how reporters quantify hot and cold energy products (*i.e.*, positive vs. negative value), based on the purpose to add or remove thermal energy. As a result, some reporters may net thermal energy while others sum the absolute values, leading to very different results. The Industry Trades recommend that EPA clarifies how thermal energy measurements should be converted to MMBtu, and the Industry Trades also recommend adding a reporting field for both cold and hot energy products in the reporting form.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Class of '85 Regulatory Response Group
Commenter Type: Other
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0329-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA should clarify the acceptable method for monitoring purchased electricity and whether there are any alternatives to metering. Metering may not be available for internal electric generation facilities' consumption from a grid containing a mix of purchased and company-owned electricity. The mix ratio between purchased electricity and a facility's own generation will change depending on the dispatch schedule, renewables availability, demand, and other factors.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: S. Dear Schramm-Satayathum
Commenter Affiliation: Citizens Energy Group
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0298-A1
Comment Excerpt Number: 2

Comment Excerpt: Citizens' Steam Utility is regulated in Indiana, subject to certain regulations promulgated and enforced by the Indiana Utility Regulatory Commission (IURC). For example, Citizens Steam Utility Terms and Conditions, approved by the IURC, require meters to be tested regularly and allows customers to request an additional testing if the customer

suspects the meter readings are inaccurate. Citizens believes the proposed rule should recognize and provide alternative provisions for meters that are subject to state adopted standards that establish requirements as an alternative to the audit timeframe and error specifications proposed in EPA's rule.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 13

Comment Excerpt: EPA should align Subpart B requirements for third-party meters with Subpart C. EPA's requirement to develop a metered energy monitoring plan and retain billing statements, certifications, and quality assurance tests for purchased electricity meters is inconsistent with EPA's current requirements for utility fuel meters found in 40 C.F.R. § 98.33 – Calculating GHG Emissions, Tier 1 Calculation Methodology. In that methodology, EPA simply and reasonably requires reporters to use annual fuel usage from the utility meters (via billing records) to calculate combustion-associated GHG emissions. Documentation of billing records, certification, calibration, and maintenance for fuel meters is not required. This straightforward approach for fuel meters is carried forward in section 98.24(b)(1)(iii) of the Proposed Rule: Fuel billing meters are exempted from the initial and ongoing calibration requirements of this paragraph and from the Monitoring Plan and recordkeeping requirements of 40 C.F.R. §§ 98.3(g)(5)(i)(C), (g)(6), and (g)(7), provided that the fuel supplier and the unit combusting the fuel do not have any common owners and are not owned by subsidiaries or affiliates of the same company. Meters used exclusively to measure the flow rates of fuels that are only used for unit startup are also exempted from the initial and ongoing calibration requirements of this paragraph. EPA can, and should, take a similar approach for purchased electric meters to calculate indirect GHG emissions from purchased electricity. This approach has served EPA and the reporting community well for over a decade without complication or criticism. Exclusively reporting annual kWh of purchased electricity consumed for each facility electric meter is a reasonable, efficient, and defensible approach that will effectively enable EPA to better understand energy intensity without unnecessarily burdening the EPA and reporters.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.20(a) be removed, for the reason of: align third-party meter requirements with subpart C.]

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.7 Comments on estimating missing data and missing data procedures

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 24

Comment Excerpt: EPA should not propose more prescriptive requirements regarding procedures for estimating missing data. EPA considered proposing more prescriptive requirements regarding procedures for estimating missing data but ultimately concluded that each individual facility is in the best position to determine the most appropriate approach for determining the period of similar operations. EPA is seeking comment on this approach to estimating missing data.

Estimation of missing data should be left to each individual facility. GPA members may have contractual terms that dictate how missing data will be estimated should any meter fail to register the power and energy delivered during any period. The estimation procedures may vary depending on the physical location of the meter. In the ERCOT grid, ERCOT Protocol 10 provides the Verification, Editing and Estimating methodology which may be contractually required. Additionally, where electricity is bought and sold between the end user and the electricity provider, there is already a financial motivation for both parties to resolve missing data as accurately and timely as practical.

In the case of missing billing statements, EPA also should permit each individual facility to estimate the missing data. The 40 C.F.R. Part 98 reporting requirements cover a large variety of facilities with different operations whose electricity usage may vary by production, throughput, seasonal variations, etc., and prescriptive missing data procedures would not be appropriate for all facilities.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.25 be removed or reduced, for the reason of: EPA should not propose more restrictive requirements for missing data.]

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.8 Comments on EPA's approach to limit calculations and reporting to purchased energy records

Commenter Name: Paul Balserak
Commenter Affiliation: American Iron and Steel Institute (AISI)
Commenter Type: Industry Trade Association**:**
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0316-A1
Comment Excerpt Number: 1

Comment Excerpt: AISI is a strong advocate of transparency and accuracy in greenhouse gas (GHG) data reporting. AISI believes that a consistent set of data will help ensure policymakers and other stakeholders employ the most accurate information in their decision-making. The AISI guidelines focus on product-level disclosures and corporate level reporting.

However, AISI believes the inclusion of energy consumption emissions for required reporting in the GHGRP is a very significant change that warrants increased collaboration with industry prior to finalization. There is an intense and growing focus domestically and internationally on collection of GHG emissions from industrial sectors. Different, conflicting and at times inaccurate methodologies for reporting GHG emissions raise problems. These differing methodologies result in significant expense to reporting industries such as Iron and Steel. The different methodologies can also lead to resulting GHG data that are inconsistent within and across industries and countries. In particular, as industries are increasingly electrified, reporting of energy consumption emissions will be even more important yet also more challenging to do accurately. AISI would appreciate the opportunity to work with EPA to ensure any potential reporting of GHG emissions from energy consumption is based on a clear understanding of the Iron and Steel sector.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Timothy A. French
Commenter Affiliation: Truck & Engine Manufacturers Association (EMA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0212-A1
Comment Excerpt Number: 3

Comment Excerpt: EMA supports a complete accounting for GHG emissions for the reasons explained by EPA at 87 FR 37018 column 1, paragraph 4: "For example, should the EPA consider adding new sector-specific requirements for operators of EAFs or other operations that may meet all their energy needs with purchased power and that may not trigger applicability under the GHGRP?" While the example here is Electric-Arc Furnaces (EAF's), the analogy is appropriate for gas compression facilities that may replace reciprocating engines with electric motors to reduce site emissions below the reporting threshold. That has the effect of driving replacement of one emissions source type with another (electric for gas drive) when a gas drive may in fact have lower GHG emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Debra J. Jezouit
Commenter Affiliation: Class of '85 Regulatory Group

Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0250-A1
Comment Excerpt Number: 3

Comment Excerpt: There are practical issues that would be raised by the Potential Energy Consumption Rule. The Class of '85 recommends that EPA assess these practical issues and analyze whether the potential consequences of inaccurate data are acceptable compared to the unclear benefits.

There are potential consequences for the imprecise estimates that likely would result. The purpose of the Potential Rule is to allow "EPA [to] estimate indirect emissions using the purchased energy data." It would be difficult for many facilities to report the source category data accurately and likely would require imprecise estimates. EPA then would use that data to estimate indirect emissions—although EPA does not indicate in the Proposed Rule how these estimates would be calculated. These estimates of estimates would not be accurate and could be taken out of context and used by third parties. This is particularly concerning for facilities that have carbon reduction targets, or goals of net zero emissions. If these estimates were published on EPA's Facility Level Information on GreenHouse gases Tool ("FLIGHT"), this likely would misrepresent the companies' emissions data.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Debra J. Jezouit
Commenter Affiliation: Class of '85 Regulatory Group
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0250-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA suggests that the approach discussed in the Potential Energy Consumption Rule would allow the Agency to estimate indirect emissions, without requiring facilities to quantify indirect emissions or having emissions count towards GHG Reporting Program applicability.[6] EPA does not explain how it would estimate indirect emissions, creating concern about how such information could be considered accurate and complete. Any rule related to expanding the GHG Reporting Program to include energy consumption would need to go through a separate rulemaking and comment period, but EPA is soliciting comments to "inform future policies."[7]

Footnotes

[6] See 87 Fed. Reg. 36,920, 37,018 (June 21, 2022).

[7] See 87 Fed. Reg. at 37,017.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 32

Comment Excerpt: Regarding the attributes of electricity purchases, EPA suggests that relevant information could include "summary data elements... characterizing associated markets and products (*e.g.*, regulated or deregulated electricity markets and renewable attributes of purchased products).[242] These data elements would likely prove useful in estimating indirect emissions associated with electricity purchases. In addition, EPA should ensure that more-detailed data are also reported, such as the eGRID subregion in which, and the entity from which, the facility purchases electricity. EPA should also consider requiring sources to report the full range of data in energy attribute certificates, including novel elements such as storage-related tags, hourly or sub hourly timestamps, grid carbon-intensity snapshots, and social or community benefit credentials.[243] These more-granular, readily reported data would enable EPA to evaluate the success that various industrial subsectors or companies have found in procuring carbon-free electricity that promotes emerging technologies and benefits underserved communities.

Footnotes

[242] *Id.*

[243] See Doug Miller, Clean Energy Buyers Ass'n, Energy Attribute Certificate Issuing Bodies Can Unleash Next Generation Procurement by Capturing More Attributes & Better Serving as a "Platform of Platforms" (June 30,2022), https://cebuyers.org/blog/energy-attribute-certificate-issuing-bodies-can-unleash-next-generationprocurement-by-capturing-more-attributes-better-serving-as-a-platform-of-platforms/.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0321-A1
Comment Excerpt Number: 7

Comment Excerpt: EPA should not require facilities to estimate GHG emissions associated with energy consumption.

The Supplemental Notice would require affected facilities to report electricity usage based on available records. Associated GHG emissions are not estimated by the reporter. INGAA generally supports this approach, which simplifies the reporting requirements and avoids complexities associated with defining GHG emission factors or estimation methods that are dependent on the energy provider. The data acquired will be informative to EPA's understanding of energy consumption and dependence for different sectors subject to GHGRP reporting. This information is adequate to support the EPA data quality improvements program discussed in the preamble, and it would provide information that can assist EPA in informing future policy. This is sufficient for EPA's needs. Adding an emissions computation is not warranted.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Leslie Bellas
Commenter Affiliation: American Fuels and Petrochemical Manufacturers (AFPM)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0323-A1
Comment Excerpt Number: 4

Comment Excerpt: The proposed reporting method for energy consumption does not reflect the process and procedures for calculating indirect emissions developed by other entities. While AFPM does not endorse any particular methodology, it is instructive to review, for example, the GHG Protocol which was developed jointly by the World Resources Institute and the World Council for Sustainable Business Development.[16] Even the single GHG Protocol presents two methods for accounting for Scope 2 emissions approaches to calculating indirect emissions – the location-based method and the market-based method.[17] These methods address how to account for renewable power purchases via renewable energy certificates, how purchases of "clean" electricity from the grid are handled, and the use of electricity suppliers' own emission factors.[18] EPA's proposal includes no such distinctions.

Footnotes

[16] GHG Protocol, GHG Protocol Scope 2 Guidance: An Amendment to the GHG Protocol Corporate Standard (2015), https://ghgprotocol.org/sites/default/files/2023-03/Scope%202%20Guidance.pdf.

[17] Id. at Section 4.1.

[18] Id.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.9 Comments regarding reporting and recordkeeping for purchased energy transactions

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0293-A1
Comment Excerpt Number: 3

Comment Excerpt: Further undermining the accuracy and usefulness of Subpart B data is the fact that invoices reflecting energy consumption are not always accurate and thus are sometimes disputed by the purchaser, with the dispute taking months to finally be resolved. In other cases, invoices are not issued in a timely manner. In either situation, the invoices received by the purchase will not accurately reflect usage over a given billing period.

Before subjecting large portions of domestic industry to another burdensome reporting requirement, EPA should ensure that the data-gathering process will actually provide information that will be accurate and useful enough to justify the burdens being imposed. To date we do not believe that EPA has made this demonstration.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 35

Comment Excerpt: As proposed in 40 CFR § 98.26, reporters are required to provide EPA with copies of one direct billing statement from each provider. The Industry Trades are concerned these statements could include confidential business information (CBI) relating to purchase agreements, rates, and thermal energy usage. It is also unclear why EPA needs reporters to submit these records; EPA does not have analogous requirements in other subparts to submit example raw data in the form of bills or invoices to validate the reported data.

Additionally, for operators with a large number of sites across a large geographical area, the proposal could require multiple providers to upload hundreds of pages of billing statements. As a practical matter, users of EPA's Electronic Greenhouse Gas Reporting Tool (EGGRT) have experienced delays in using the system when many reporters are using the system simultaneously; this seemingly simple task could result in very time intensive uploading requirements during a reporting period. Reporters are not required to submit this level of documentation for other subparts, but instead follow the recordkeeping requirements codified in

40 CFR and the appropriate subparts. The Industry Trades support that same approach for Subpart B.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 37

Comment Excerpt: It is not uncommon for some billing information to not be finalized for up to six- months or longer. As a result, there could be instances where complete billing information may not be available by the reporting deadline for the complete prior calendar year. The Industry Trades request that EPA allow for the use of best information available or other reasonable estimation methods to estimate partial-year energy consumption when a full calendar year of billing is unavailable.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0293-A1
Comment Excerpt Number: 6

Comment Excerpt: The Subpart B data reporting requirements should be revised. EPA is requiring monthly invoice data for monthly billing cycles, but there is uncertainty on how data would be reported when the monthly cycle does not run from the first day of the month to the last, but instead from the 15th day of the month to the 14th day of the next month. In the latter case, the possibility exists that reporting companies would have to calculate which part of the invoice that was spread across two months represented usage in the first month as opposed to the second. This would be unnecessarily complicated, particularly when large numbers of meters and invoices were involved. We see no benefit to EPA from the increased granularity represented by a monthly based reporting requirement, as opposed to the yearly based requirements that we have traditionally seen in the GHG reporting program. In any event, we request clarification of the rule language with respect to reporting of monthly invoices that run from a portion of month 1 into a portion of month 2.

We also see an issue with subsection (b) of proposed § 98.26. That subsection requires a company to report the county in which each meter is located. Energy purchasers will not always know the exact physical location of the meters that measure their energy usage; rather, they may only have billing address information. We do not understand the benefit to the GHG reporting program of such granular information, and a company should not be required to provide the county-specific information requested by subsection (b) if that information is not readily available to the reporting company.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 16

Comment Excerpt: At a maximum, the covered facility should only be required to report the quantity of their annual purchased electricity and thermal energy products and provide a certification to the fact that the reporting is true, correct, and accurate to the best of the reporter's knowledge and information available.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 39

Comment Excerpt: The Industry Trades recommend that EPA remove any requirements to report data more granular than annual data. It is unclear how EPA could even use monthly purchased energy data to assess facility energy intensity. The onerous reporting requirements proposed in this new subpart indicates that EPA believes it can apply automatic checks to ensure all energy consumption bills are as expected and accounted for, the number of expected bills are reported (billing sequence), and that start dates and end dates align. However, given the wide range of energy providers, facility types, geographic locations and other factors, this assumption is incorrect. Bills are subject to billing corrections, rebills, negative usage bills to handle calibration errors, higher-than-previous usage to correct calibration errors; bills with zero usage to handle payment adjustments, overlapping start and end dates, some bills that cover two

months instead of one, meters going into service, meters coming out of service, etc. It will be an enormous burden to report detailed information from every bill, EPA has not justified this effort, and EPA will likely burden reporters with error checking for very typical billing inconsistencies. For all of these reasons, EPA should collect annual data only.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 20

Comment Excerpt: Only annual, not monthly, usage data should be reported. For the numerous reasons provided below, EPA should request annual energy usage only and not require per-billing-statement information. Reporting per billing statement presents numerous, significant challenges and would result in an excessive volume of data being reported. EPA should be able to meet the goal and intent of Subpart B collecting annual usage only.

a. The preamble indicates only annual energy usage reporting is required. The Proposed Rule preamble and the Proposed Rule text for § 98.26 would require conflicting levels of reporting. The Selection of Proposed Data Reporting Requirements for Subpart B in the proposal seems to require reporting of only annual energy usage: "facilities would be required to report the annual purchases of electricity (in kilowatt hours (kWh)) and thermal energy products (in million British thermal units (MMBtu))" Id. at 32,891. The proposed text for § 98.26, however, appears to require data from each periodic billing statement to be reported. This could be as frequent as monthly usage. Consistent with Section IV.A.8 of the preamble, GPA requests that EPA clarify that the reporting requirements are only for annual usage and that EPA revise the proposed text in § 98.26 accordingly.
b. Reporting every bill for every meter is an enormous amount of data for GPA reporters. Because gathering and boosting assets are reported basin-wide, every small electricity meter in the basin could be within the scope of Subpart B. Requiring per-meter-per-bill information is thus a huge amount of data. One member company has approximately 2,000 meters that EPA might determine would be subject to reporting under the proposed Subpart B, and in 2022 those meters had 21,659 unique bills, most of which covered one month. This is multiplied by six records requested per meter-bill (meter number, sequence, start date, end date, use, rate descriptor). Under the Proposed Rule, this company would have to report nearly 130,000 data points for this requirement alone. EPA should limit data reporting to annual usage only. This would be a more manageable level of data for reporters as well as EPA.
c. Reporting monthly data is excessive compared to other reporting requirements under 40 C.F.R. Part 98. Subpart C, for example, allows companies to obtain the amount of fuel

combusted from gas billing records, and calculate and report emissions based on those billing records. Subpart C does not, however, require the amount of fuel combusted per billing statement to be reported. Purchased fuel and purchased energy are comparable data points from a billing perspective, and the reporting requirements for purchased energy should be consistent with those for purchased fuel. In other words, if EPA has not previously justified collecting monthly data under Subpart C, then it makes little sense for EPA to collect beyond-annual data under Subpart B.

d. EPA does not adequately justify collecting per-bill data. The only place EPA speaks to collecting more-frequent-than-annual data for Subpart B appears to be in the confidentiality determination document (not the preamble, the technical support document, or the burden assessment, all of which would be a more appropriate setting), where EPA says of requesting billing dates, "[t]he dates corresponding to meter readings are chronological records used to log meter readings into a database. These dates are valuable for characterizing the seasonality of readings and for comparing usage by month from year to year, but these dates are not anticipated to convey useful information when viewed separately from usage data (which the EPA proposes to be eligible for confidential treatment in this document)."[31] EPA offers just 20 words to justify this incredible level of effort. Especially given the exponential increase in reported records associated with beyond-annual data reporting, EPA must provide a more robust justification of its need and authorization to collect seasonal energy usage data under the GHGRP. GPA does not believe such a justification exists. The purported intent of Subpart B is for EPA to collect "data on energy consumption to gain an improved understanding of the energy intensity (*i.e.*, the amount of energy required to produce a given level of product or activity, both through onsite energy produced from fuel combustion and purchased energy) of specific facilities or sectors, and to better inform our understanding of energy needs and the potential indirect GHG emissions associated with certain sectors." To achieve this goal, annual energy consumption should be sufficient.

e. EPA cannot burden certain reporters with vastly more information to report simply because they receive energy bills more frequently than other reporters. This is fundamentally unfair, and it does not result in better or more useful information being reported to EPA.

f. Reporting monthly data would also present significant challenges related to rebills or corrections to previously paid bills. Most companies maintain such bills as separate records in a database, possibly with negative or zero usage (see Examples A and B). It would be extremely burdensome to filter out these types of records for the sole purpose of meeting Part 98 reporting requirements, especially for zero usage rebills that have no conceivable relevance to the EPA.

g. Reporting the sequence of bills will be challenging and is unlikely to meet EPA's expectations. The proposed sequence is a number from 1 to 12 for monthly billing cycles, from 1 to 4 for quarterly billing cycles, and 1 to 2 for semi-annual billing cycles. EPA does not contemplate other billing frequencies. Meters may not have the expected number of records depending on when the start and end dates for the cycle are and how allocation is performed. For example, there may be 11 or 13 monthly records for a given reporting year (see Examples C and D). It is extremely rare for billing cycles to end on December 31, so most facilities will have bills that straddle reporting years. Depending

on how allocation is done, the number of records assigned to a reporting year could vary. Meters are also frequently placed into and taken out of service (see Examples D and E). This is especially common for a gathering and boosting "facility" that includes hundreds or thousands of (mostly small usage) electricity meters. EPA does not seem to account for this in its reporting provisions. Specific in-service and out-of-service dates are also not readily available, and it would be burdensome for EPA to require them to be reported. GPA assumes EPA envisions data consistency checks built into e-GGRT to ensure billing start and end dates align and billing sequence numbers are as expected, but the reality is that actual billing meter data is just not that "clean." These are important and additional reasons why reporting should be limited to annual usage.

h. EPA's Assessment of Burden Impacts for the Proposed Rule substantially underestimates the level of effort required by the Proposed Rule, which could be reduced with annual reporting. Although EPA based the burden assessment on a total of 7,840 reporters, that number is misleading for the upstream and midstream oil and gas industry. Under Subpart W reporting for Onshore Petroleum and Natural Gas Production and Onshore Petroleum and Natural Gas Gathering and Boosting, entire production and gathering systems are reported as a single "facility" on a single report. For reporting under Subpart B, a single "facility" in either of these segments will have dozens to hundreds of electricity meters to track. The burden assessment fails to account for this as it applies the exact same (low) level of effort to all reporters. To compile and report the volume of data EPA is requesting for this huge number of facilities and meters is a substantial burden. Reporting only annual usage would relieve much of this excessive burden.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter,

(1) the proposed requirements at 98.24(a)(3) and 98.26(g)(h)(i) be removed, for the reason of: only annual data should be reported; and

(2) the proposed requirements at 98.26(j)(1)(2) be changed, for the reason of: only annual data should be reported.]

Footnotes

[31] Proposed Confidentiality Determinations and Emission Data Designations for Data Elements in Proposed Supplemental Revisions to the Greenhouse Gas Reporting Rule. Table 2, column "Rationale for the Proposed Confidentiality Determinations" for Citation 98.26(h)

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Stephanie Engwall
Commenter Affiliation: Atmos Energy Corporation
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0328-A1
Comment Excerpt Number: 11

Comment Excerpt: The Proposed Rule requires monthly invoice data for monthly billing cycles, but it is not clear how the data should be reported when the cycle does not run from the first day of the month to the last. To address this issue, EPA should clarify that companies are allowed report year-end data.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Joseph D'Ath
Commenter Affiliation: National Lime Association (NLA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0304-A1
Comment Excerpt Number: 1

Comment Excerpt: In the proposal, EPA proposes to allow engineering judgement to differentiate electricity use between activities not related to the industrial source activity (88 FR 32891)[1]. This will apply to any Subpart S lime manufacturing plant which also has other product lines at the facility (*e.g.*, making crushed and broken limestone and/or making precipitated calcium carbonate).

In the absence of dedicated electricity meters for product lines not related to Subpart S, NLA supports the proposal for allowing engineering judgement. However, any applied judgment will only be a best estimate, which should be recognized by EPA.

Footnotes

[1] Reporters would be allowed to exclude purchased electricity as estimated by company records or engineering judgment, where: (1) electricity is generated outside the facility and delivered into the facility, but the final destination and usage is outside of the facility, or (2) electricity is consumed by operations or activities that do not support any activities reporting direct emissions under this part.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Kimberly S.L. Bauman
Commenter Affiliation: Mississippi Lime Company
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0297-A1
Comment Excerpt Number: 1

Comment Excerpt: We request that EPA recognize "engineering judgment" will, indeed, only be an estimate of electricity related to Subpart S and non-Subpart S production/activities.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: James D.W. Roush
Commenter Affiliation: CMS Energy Corporation
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0307-A1
Comment Excerpt Number: 1

Comment Excerpt: In § 98.26(j)(4), EPA has provided that a facility may exclude electricity consumed by operations or activities that do not support any activities reporting direct emissions under Part 98. The preamble indicates that best engineering judgement can be utilized to estimate the amount of energy consumed by the emitting source as opposed to energy consumed by activities not related to the emitting source. Without additional clarity on how to parse electricity consumed by the relevant emitting source, this will likely result in dissimilar energy consumption data submitted for the Subpart W Natural Gas Distribution segment and will require the regulated community an exorbitant amount of administrative burden and documentation.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0311-A1
Comment Excerpt Number: 4

Comment Excerpt: SIA believes the tracking of energy usage between Subpart sources is burdensome and would not result in improvement of the emissions accuracy and thus should not be required. For example, while the proposed rulemaking notes that company records or engineering judgement may be used to determine electricity purchase allocation to applicable subparts, Subpart C and Subpart I reported emissions are interrelated. The Subpart C emissions are due to equipment that support Subpart I sources and in some cases are emitted within the same building or exhaust system with the Subpart I emissions. Semiconductor manufacturing sites have supporting facilities, office buildings and other operations at the facilities that are not direct emitters and therefore would require significant engineering judgement to allocate energy use metered on a site level to individual GHG-emitting processes.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 45

Comment Excerpt: The Industry Trades also request EPA to remove, or at least provide clarification/guidance regarding, the requirement to assign the decimal fraction of purchased energy to applicable GHGRP Subparts under 98.26(l) for larger integrated facilities that utilize multiple external electrical/thermal connections with on-site energy generating units or thermal production units, as it would be overly burdensome to reasonably segregate and calculate purchased energy from site generated energy with any reasonable confidence due to the fluid nature of imported and exported energy across a large facility. Similarly, guidance of scenarios on calculating excluded quantities under 98.26(j)(4) would be valuable for the regulated community as purchasing/selling of energy may overlap based on energy loading across the larger integrated facilities and surrounding community.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 25

Comment Excerpt: Remove the requirement to speculate as to a decimal fraction of purchased energy attributable to other subparts. EPA proposes that "[f]acilities subject to multiple direct emitting part 98 subparts must report, for the quantities reported under paragraph (j) of this section, the decimal fraction of purchased electricity or thermal energy products attributable to each subpart. The fraction may be estimated based on company records or engineering judgment.[36] First, EPA provides no justification for why it needs this data, as required by law. Second, this requirement is very unclear. If a natural gas processing plant has an electrically driven compressor and it reports combustion emissions under Subpart C and compressor emissions under Subpart W, is the electricity used to drive the compressor "attributable" to Subpart C (the electricity is offsetting the combustion emissions that would otherwise have been reported under Subpart C) or is the electricity "attributable" to Subpart W? EPA should eliminate this requirement or, at the very least, clarify how electricity used to offset combustion emissions should be considered.

Second, EPA is asking reporters to either guess (*i.e.*, use bad data) or undertake a huge amount of work. At the burden level that EPA estimates (just a few hours a year per facility for all of Subpart B), it appears the agency expects a rough guess. Something more robust would require tremendous effort because a facility reporting under Part 98 may have electricity usage associated with office or communication equipment that is not part of any emissions unit but is at the site and using electricity. Determining which meters are serving which pieces of equipment at each facility and excluding equipment that is not an emissions unit would require an extensive and burdensome level of effort and research. Because the result of this intensely burdensome exercise would ultimately just be an estimate, GPA believes this requirement should be removed. Reporters are also uncomfortable with certifying reports that contain highly estimated data, as this requirement would.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.26(l) be removed, for the reason of: remove decimal fraction requirement and burdensome rough guess.]

Footnotes

[36] 88 Fed. Reg. at 32,926 (proposing new section 40 C.F.R. § 98.26(l)).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Patti Hershey
Commenter Affiliation: Lower Colorado River Authority Transmission Services Corporation (LCRA)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0303-A1
Comment Excerpt Number: 6

Comment Excerpt: The proposed data reporting requirements include a requirement that each report contain information about **each** meter including the county, provider's name (in deregulated markets such as ERCOT), meter number, and rate descriptor in addition to the amount of electricity purchased. The data reporting requirement section is designed for large sites with a single provider and does not fit Subpart DD facilities. Currently for Subpart DD facilities, the annual report covers all of the various SF_6 locations **in aggregate**. There is not a listing of each and every site. Requiring all of the proposed data for Subpart DD facilities will be challenging at best and possibly infeasible.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 29

Comment Excerpt: As proposed, the recordkeeping and reporting requirements in Subpart B require reporting detailed supplemental data not required by any other subpart in the GHGRP, and therefore should not be required here. Reporters are not required to submit this level of documentation for other subparts, but instead follow the recordkeeping requirements codified in 40 CFR and the appropriate subparts. The Industry Trades support that same approach for Subpart B. If EPA requires meter-level reporting, the Industry Trades suggest the requirement for supplying energy meter data should reside with the energy provider, not the purchaser.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 34

Comment Excerpt: As proposed, 40 CFR 98.26(f) requires operators to report several pieces of data for each meter for each bill received. This requirement will be extremely burdensome while failing to increase transparency in reporting. For the oil and natural gas industry, this could require reporting hundreds, if not thousands, of individual meters. As described above, meters can be changed by the energy provider, with or without the purchaser's knowledge, throughout the course of the reporting period. Such meter changes could result in a Designated Representative (DR) certifying a report that may not be accurate as of December 31st of the reporting period.[3] As these meter numbers can change, requiring electricity purchasers to provide this level of detail does not increase EPA's ability to review or otherwise QA/QC the reported data, while still significantly increasing the burden of reporting on energy purchasers. Finally, the requirement to report meter location information to the county/city level can become very complex for facilities operating across a wide geographical area. The Industry Trades are respectfully recommending the removal of this reporting requirement.

EPA is also proposing reporters to include a "description of the portions of the facility served by the meter." As described above, this requirement would encompass hundreds of meters across a wide geographical area which could change with or without the purchaser's knowledge. This requirement is also burdensome at complex facilities, such as refineries, which may purchase electricity to supplement on-site electricity generation. The Industry Trades believe these

reporting requirements to be overly burdensome and ultimately do not increase the transparency or quality of reported data.

Footnote

[3] As required in 40 CFR Part 98.4(e), each Designated Representative signs the following certification statement: "I am authorized to make this submission on behalf of the owners and operators of the facility or supplier, as applicable, for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 21

Comment Excerpt: EPA must alleviate the Proposed Rule's reporting burden by providing exemptions or accommodations for small usage meters. EPA does not contemplate small-use electricity meters or consider appropriate exemptions to data collection on meters that have negligible impact on overall facility energy use. In addition to limiting data collection to annual data, EPA must also consider ways to alleviate reporting burden for the thousands of small use meters, specifically in oil and gas.

a. Oil and gas reporters have a huge number of small use electricity meters. In the field (between booster stations), this electricity is used for pipeline cathodic protection. At gathering and boosting compressor stations, electricity might be used for control power, electric heat tracing, and/or air compressors. These uses have little power demand compared to facilities that run electrically driven gas compression. One GPA member company reports that of their 1,999 active meters ("active" meaning greater than zero electricity use during 2022), just 69 meters (3.5%) accounted for 95.5% of their electricity usage and 95.8% of their Scope 2 emissions. This member company reports that the 1,930 low-use meters accounted for just 17,604 $mtCO_2e$ in 2022 for all 1,930 meters combined;[32] this is less than 10 $mtCO_2e$ per meter on average. All 1,999 of these meters would be subject to Subpart B. Another member company reports that of their 2,295 meters, just 82 (2.5%) account for 95% of their electricity usage. This is similar for all midstream reporters, *i.e.*, reporters use many electricity meters, the vast majority of which use have very little usage. GPA notes this is yet another example of why

EPA's basin-wide reporting continues to be problematic. Because most (*i.e.*, 90%+) meters in the midstream segment have very little electricity use, EPA must reduce the number of meters subject to reporting under Subpart B.

b. EPA is expecting perfection of data on thousands of very small use electricity meters. The fact is that EPA is expecting 100% perfection in billing data for 100% of reported meters – no missing bills,[33] alignment of start and end dates, no missing usage, etc. This is not even an expectation reporters or utilities have for billing purposes.[34] Because midstream operators have thousands of power use bills (most of which reflect very small electricity use), GPA members do not seek to correct every possible error or inconsistency; instead, those members apply thresholds where certain records are flagged, and companies may or may not follow up on them depending on the situation. Without an exemption for small use meters, EPA is imposing a level of billing perfection that reporters have never sought, and Subpart B as proposed will therefore increase regulatory burden significantly.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter,

(1) the proposed requirements at 98.20(a), 98.26(j)(1)(2), and 98.26(j)(3)(i)(ii) be changed, for the reason of: to provide exemptions or accommodations for small usage meters;

(2) the proposed requirements at 98.25 be removed or reduced, for the reason of: EPA is expecting perfection of data on thousands of very small use electricity meters;

(3) the proposed requirements at 98.26(a)(b)(c)(e)(g)(h)(i)(k)(l)(m), 98.26(m)(1)(2)(3) and 98.27(b)(c) be removed, for the reason of: to provide exemptions or accommodations for small usage meters; and

(4) the proposed requirements at 98.26(d)(1), 98.26(f) and 98.27(a) be removed or changed, for the reason of: to provide exemptions or accommodations for small usage meters.]

Footnotes

[32] Using eGRID emission factors.

[33] *E.g.*, 98.27(a) Copies of all purchased electricity or thermal energy product billing statements.

[34] For example, if a bill is missing, a reporter might contact the utility about the missing bill, and the utility may issue an invoice, but not the full bill with usage, rates, etc.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Joseph D'Ath
Commenter Affiliation: National Lime Association (NLA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0304-A1
Comment Excerpt Number: 3

Comment Excerpt: NLA questions why certain additional data EPA is requesting for Subpart B is necessary (*i.e.*, price, quantity of purchased thermal energy product, copies of electricity bills, etc.). These data serve no useful purpose, are not justified or even necessary, and add to the overall reporting burden and should be removed from proposed Subpart B.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: James D.W. Roush
Commenter Affiliation: CMS Energy Corporation
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0307-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA has clearly stated it is not proposing to require reporters to calculate or report indirect emissions estimates from the proposed collection of energy consumption data. EPA also recognized that under the proposed reporting requirements, the Agency would not receive information on the energy attributes of the metered electricity or metered thermal energy products purchased. Since facilities would report only the quantities of energy products purchased, requiring reporting information on the sources used to generate the purchased electricity or thermal steam product is not relevant information under the scope of this proposed rule.

Additionally, requiring the reporting of the rate descriptor has no purpose and is not necessary information to EPA; it is not relevant to reporting annual quantities of purchased electricity and/or thermal energy products. To relieve some of the reporting burden this revision is imposing, this requirement should be deleted from § 98.24(4) Monitoring and QA/QC requirements and § 98.26(k). § 98.26(j)(4) Excluded quantities. We respectfully request that EPA provide further clarity on the following requirement: "For the purpose of reporting under this paragraph (j), the facility may exclude any electricity that is generated outside the facility and delivered into the facility with final destination and usage outside of the facility."

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: James D.W. Roush
Commenter Affiliation: CMS Energy Corporation
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0307-A1
Comment Excerpt Number: 5

Comment Excerpt: The EPA is proposing that facilities must retain copies of all purchased electricity or thermal energy products billing statements, the results of all required certification and quality assurance tests referenced in the MEMP for all purchased electricity meters or thermal energy products meters used to develop the energy consumption values reported under this part, and maintenance records for all monitoring systems, flow meters, and other instrumentation used to provide data on consumption of purchased electricity or thermal energy products under this part.

We recommend that the maintenance records specified in § 98.24(a)(7) should be specific only to the monitoring equipment utilized for thermal energy products. Maintenance of electric meters is not typically done on-site, instead an electric meter will be replaced by the energy service provider. Thus, updating the information in § 98.24(a)(8) is necessary but no additional records should be required to be obtained from the energy provider regarding maintenance or repair.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0321-A1
Comment Excerpt Number: 8

Comment Excerpt: INGAA supports retention of certain data such as billing statements as described in 98.26(m) to support the verification of the energy consumption data reported. Due to the volume of these records, INGAA recommends EPA allow this data to be maintained on-site and be available at the request of EPA, but not required as a reporting submission. Additionally, operators typically do not have records to differentiate the sourced electricity (solar, wind, geothermal, etc.) INGAA, therefore, requests that this proposed requirement be removed.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Leslie Bellas
Commenter Affiliation: American Fuels and Petrochemical Manufacturers (AFPM)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0323-A1
Comment Excerpt Number: 5

Comment Excerpt: Proposed subpart B, which requires facilities to report metered energy consumption, does not account for the fact that while facilities have electricity meters, use of electricity within the facility may not be separately metered. Consequently, the reporting facility could not segregate purchased electricity used in connection with the unit or activities subject to the GHGRR and those energy consumption uses not subject to this obligation, including building energy consumption. Given the availability of direct emissions data and concerns about the accuracy of indirect emissions data as expressed by the multiple approaches to calculating those emissions, EPA admitted when finalizing the GHGRR, there is little value in EPA collecting facility energy consumption information.[19]

Footnotes

[19] 74 Fed. Reg. at 56,289.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 5

Comment Excerpt: If EPA pushes forward with Subpart B despite lack of authority, EPA should shift the focus from non-pertinent and unnecessarily detailed data to information that could be used to truly assess energy intensity. In this proposal, EPA requests overly burdensome—and, in some cases, impossible—data quality assurances and recordkeeping/reporting requirements that are mired in minutia (as detailed in our comments below). At the same time, EPA does not request information that is relevant, and in some cases even critical, to assessing facility energy intensity. If EPA's goal is to understand facility energy intensity, this Proposed Rule is inadequate. If EPA's goal is to collect information to understand Scope 2 emissions, then EPA already has this information from the energy generators. If EPA's goal is to understand Scope 2 emissions per facility, then EPA merely needs to request annual kWh or MMBtu, not ancillary data like pictures of bills and names of service providers. As detailed in our following comments, EPA should eliminate all requirements of Subpart B that are not directly related to the amount of energy purchased. If EPA believes it has the authority under this rule to collect data "to gain an improved understanding of the energy intensity… of specific facilities or sectors, and to better inform our understanding of energy needs and the potential indirect GHG emissions associated with certain sectors," then EPA will need to repropose a rule that identifies the source of this authority and that actually endeavors to understand the energy balance of a facility.[15]

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.20(b)(2) be changed, for the reason of: to shift focus from details to energy intensity]

Footnotes

[15] 88 Fed. Reg. at 32,885.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 6

Comment Excerpt: Reporting power generation sources should be optional. EPA proposes reporting the quantity of purchased electricity generated by each of the following sources: non-hydropower, including solar, wind, geothermal and tidal; hydropower; natural gas; oil; coal; nuclear; and other if this information is known. Reporting this information should be optional only (not required). As described elsewhere in our comments, EPA's proposal would request excessive information about power generation from customers instead of from the electricity supply service providers, who are much better positioned to accurately provide this information. Also, as described in the previous comment, by focusing only on purchased energy and not considering other energy sources or sinks, EPA is not proposing to collect information required to understand a facility's energy balance (*i.e.*, the stated goal of the proposal), so why is EPA collecting this secondary level of information (generation source of purchased energy)? We support reporting of this information only on an optional basis as reporters may want to demonstrate their efforts to secure renewable sources for power generation.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 16

Comment Excerpt: EPA failed to provide justification for the collection of many data elements. GPA describes in this comment letter why many of the Proposed Rule's requirements should be changed or removed for legal, technical, or implementation reasons. Beyond that, however, GPA could not find in the Proposed Rule, the technical support document, the burden assessment, or the confidentiality determinations EPA's justification for why the records listed

below are needed for EPA to meet its stated goals. EPA is not authorized to collect data simply because it exists. EPA should remove the following requirements due to lack of justification for the data collection:

a. A photograph that shows the meter identifier, manufacturer's name, and model number [98.24(a)(2)].

b. For each meter, an indication of the billing frequency (*e.g.*, monthly, quarterly, or semi-annually) [98.24(a)(3)].

c. A copy of one typical billing statement that includes all pages for each meter with the meter identifier, the name of the energy delivery service provider, the name of the energy supply service provider (if applicable in deregulated states), the dates of service, the usage, and the rate descriptor [98.24(a)(4), 98.26(m)].

d. The state in which each meter is located [98.26(a)].

e. The locality of the meter [98.26(b)].

   i. To associate electricity use data with eGRID subregions[27] EPA should collect the physical zip code of the meter, not locality.

f. For purchased electricity, the zip code associated with the payment address for the provider 98.26(d)(1)].

   i. To associate electricity use data with eGRID subregions, EPA should collect the physical zip code of the meter. EPA does not provide a reason why it would ask for—and there is no reason EPA should need to know—where utility bill payments are sent, as that location has little to do with the facility consuming energy or the facility generating energy.

g. For purchased thermal energy products, the public GHGRP facility identifier of the energy supply service provider. If the provider does not have an assigned GHGRP facility identifier, report the zip code for the physical location in which the thermal energy product was produced. [98.26(d)(2)].

h. Energy delivery service provider's name (*i.e.*, the name of the entity to whom the purchasing facility will send payment) [98.26(e)].

i. Annual sequence of bill [98.26(g)][28]

j. You must report the kWh used as reported on each periodic billing statement received during the reporting year [98.26(j)(1)].

k. You must report the quantity of thermal energy products purchased as reported on each periodic billing statement received during the reporting year, converted to MMBtu. [98.26(j)(2)].

l. Rate descriptor for each electricity billing statement [98.26(k)][29]

m. Copy of one billing statement per energy delivery service provider [98.26(m)].[30]

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.24(a)(2)(3)(4), 98.26(a)(b)(c)(e)(k)(m), 98.26(d)(1)(2) and 98.26(m)(1)(2)(3) be removed, for the reason of: failure to provide justification.]

Footnotes

[27] https://www.epa.gov/system/files/documents/2023-02/power_profiler_zipcode_tool.xlsx.

[28] In the confidentiality determination document, EPA says "[t]his identifier is valuable for characterizing the seasonality of readings," but a number (integer) does no such thing. EPA would be making assumptions correlating a number like "4" to a "season" [which could be correlated to March or April or May (monthly billing), or August (bi-monthly billing) or winter (quarterly billing)].

[29] In the confidentiality determination document, EPA says "[t]hese codes are valuable for characterizing daily and weekly usage patterns," but EPA does not justify why it needs information on daily or weekly usage patterns.

[30] In the confidentiality determination document, EPA says, "[a] copy of one typical billing statement is valuable for verification of reported data and units of measure," but "valuable" is not the same as "necessary."

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 26

Comment Excerpt: Allow allocation to be optional. Allocating purchased electricity data [98.26(j)(3)] over two separate reporting years would be a best guess in most cases, providing little value. It would also be an enormously burdensome exercise given the large number of meters used by midstream reporters. Most reporters would utilize billing records/databases as the source of information for Subpart B reporting, and these databases are not necessarily set up to support allocation. Allocation would be difficult to implement and be a source of confusion since the same billing cycle could be bill 12 in one year, then bill 1 the following year. These allocation difficulties are another reason data reporting should just be on an annual basis without requiring billing sequence data. However, some reporters may already allocate for other reasons, so GPA recommends that reporters be allowed to report allocated data as an option.

Non-allocated data should be "close enough" to assess energy use, especially over the course of a few years of data. If EPA will be creating policy or rules based on just one year of data, and therefore needs allocated data, then this data collection effort should be a one-time ICR request and not an annual data collection effort continuing into the indeterminate future.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.26(j)(3)(i)(ii) be changed, for the reason of: allow allocation to be optional]

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 27

Comment Excerpt: Clarity is needed on several requirements if they are not removed. First, EPA requires reporters to keep records of all purchased electricity or thermal energy product billing statements [98.27(a)]. However, many midstream companies use a third party to manage power bills. EPA should confirm that third party retention of billing statements satisfies 98.27(a).

Second, EPA requests, for purchased electricity, the zip code associated with the payment address for the provider [98.26(d)(1)]. The zip code associated with the payment address will not help EPA meet its goal of understanding energy usage and/or indirect emissions. The payment address zip code could be in a different state versus where the energy is consumed. EPA must provide justification for this reporting requirement if it intends to retain it. Additionally, eGRID data links meter physical zip code with eGRID subregion.[37] It seems to make much more sense for EPA to collect the zip code of the physical meter to reasonably estimate indirect emissions, since the GHGRP "facility" will likely cover hundreds of possible zip codes for basin-level reporters. EPA should therefore change this to the zip code of the meter. EPA seems to think the payment zip code is somehow an "identifying number"[38] that EPA will somehow associate with the energy delivery service provider. Without explanation of what EPA is aiming to achieve with this "number," we cannot comment other than to request removal of this requirement.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter,

(1) the proposed requirements at 98.26(d)(1) be removed or changed, for the reason of: clarity is needed; and

(2) the proposed requirements at 98.27(a) be removed or changed, for the reason of: need clarity that third party retention of billing statements suffices.]

Footnotes

[37] https://www.epa.gov/system/files/documents/2023-02/power_profiler_zipcode_tool.xlsx

[38] Proposed 98.26(d) An identifying number for the energy delivery service provider as specified in paragraph (d)(1) or (2) of this section: 98.26(d)(1) For purchased electricity, the zip code associated with the payment address for the provider.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 31

Comment Excerpt: "The EPA also seeks comment on measures that could minimize the burden of reporting parameters related to purchased metered electricity or metered thermal energy transactions." In summary, and as described in our preceding comments and in Appendix B, EPA should minimize burden as follows:

a. Remove the MEMP and most requirements related to recordkeeping, quality assurance, and maintenance for third party equipment.

b. Require only annual usage data.

c. Allow basin-level energy usage reporting.

d. Exempt small use meters.

e. Move the Subpart B reporting deadline to May 31.

f. Remove requirement to report following data:

i. The state in which each meter is located [98.26(a)]

ii. The locality of the meter (county/city) [98.26(b)]

iii. Energy delivery service providers name [98.26(c)]

iv. An identifying number for the energy delivery service provider [98.26(d)]

1. The zip code associated with the payment address for the provider [98.26(d)(1)]

2. The GHGRP facility identifier of thermal energy products [98.26(d)(2)]

v. Electricity supply service providers name [98.26(e)]

vi. Meter number [98.26(f)]

vii. Annual sequence of bill [98.26(g)]

viii. Start date of periods billed [98.26(h)]

ix. End date of periods billed [98.26(i)]

x. Quantities of purchased electricity and thermal energy products (other than annual) [98.26(j)]

xi. Rate descriptor for each electricity billing statement [98.26(k)]

xii. Decimal fraction attributable to each subpart [98.26(l)]

xiii. Copy of one billing statement per energy delivery service provider [98.26(m)]

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Stephanie Engwall
Commenter Affiliation: Atmos Energy Corporation
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0328-A1
Comment Excerpt Number: 12

Comment Excerpt: Under § 98.26, the Proposed Rule would require a company to report the county in which each meter is located. But, energy consumers may not know the exact location of each meter and may only have billing information. To address this issue, EPA should clarify that companies are not required to provide county-specific information if those details are not readily available.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: L. Ritts
Commenter Affiliation: National Environmental Development Association's Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0331-A1
Comment Excerpt Number: 3

Comment Excerpt: Notwithstanding the further administrative procedures that would be required to expand this rulemaking, EPA in the May 22nd Notice, requests comment on the next stage of reporting that the agency appears to anticipate it will require. The Notice states --

The EPA is considering further expanding the reporting requirements for this proposed subpart to include information on the sources used to generate the purchased electricity or thermal energy when this information is known to reporters, such as with facilities that have a bilateral power purchase agreement with an energy provider. In these cases, this information would allow

GHGRP data users to more accurately estimate the indirect emissions attributable to these purchases as compared to using regional grid factors or other less accurate methods. The EPA is seeking comments and information related to this potential expansion. For electrical energy, the EPA is seeking comment on requiring facilities to report the quantity of purchased electricity generated by each of the following sources: including solar, wind, geothermal and tidal, hydropower, natural gas, oil, coal, nuclear, and other. For thermal energy, the EPA is seeking comment on requiring facilities to report the quantity of purchased thermal steam generated by each of the following sources: solar, geothermal, natural gas, oil, coal, nuclear and other. In addition, the EPA is also seeking comment on the availability of this data to reporters. In some situations, the EPA believes this information would be readily available, such as when a bilateral purchase agreement for dedicated off-site generation is in place. In most situations, the EPA anticipates facilities would not have access to this information, however, the requirement would be to report this information only if known. This would minimize burden as facilities would not be required to acquire any new information from their energy suppliers.
Id. at 32891-2.

The source and quantity of purchased electricity is not readily known by the majority of electricity purchasers, because of how power is "wheeled" and dispatched by regional and state transmission operators (RTOs/STOs) and other intermediary energy transmission operators.[5] Moreover, many companies, particularly medium to large companies, may well purchase energy through a central or corporate office or in some cases, an intermediary agent. Thus, the GHGRR-regulated facility itself does not have the data from the utility—it is held by a different business functionary, or an independent business or agency outside the corporation, which may or may not be disaggregated to the site level.

EPA should not pursue this rulemaking until the agency has a far better understanding the complexity of powering manufacturing processes that would allow it to reasonably assess the scope and cost of the proposed regulatory activity as well as its value. For example, EPA should bear in mind that energy delivered to a plant is not delivered necessarily to a main meter, but in fact in many instances, it may be delivered to many meters across a plant site. Further, all energy is not used for manufacturing at a plant site. Many large industrial complexes across the country have multiple operations onsite, including administrative and business offices, research and development operations, and manufacturing and shipping. They may be metered collectively, separately, and in some instances, they may have multiple energy supply connections, including thermal conduits to other processes within the plant or another facility and/or small turbines onsite that are shared by different process lines. In nearly all of these instances, it would greatly complicate the already painstaking reporting task to track the highly variable origin, volume, and source of fuel for the energy that regional and state transmission authorities buy at the cheapest auctioned price, and which is dispatched by local operators to various purchasers at any given point in time.

Footnotes

[5] Only in a very limited number of instances, such as the exclusive use of a single combined heat and power plant, would the manufacturer be able to track the types of fuels that the electric generating unit (EGU) utilizes, particularly if the EGU was built to take advantage of a natural gas pipeline, hydroelectric source, coal mine, or nuclear plant. If a thermal energy product is dispatched by a particular electric generating unit and is not augmented by another energy source and/or or shared

with other users, the generator would have fuel records available for the period in which thermal units were dispatched.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Patrick Serfass
Commenter Affiliation: American Biogas Council (ABC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0313-A1
Comment Excerpt Number: 3

Comment Excerpt: We believe facilities should be able to report and claim biomethane benefits based on the life cycle assessment (LCA) of the fuel. As such, the GHGRP should allow the end user or facility that purchases renewable natural gas to claim the full benefits of such fuel. When the GHGRP allows LCA and avoided methane to be reported, it will encourage external markets to recognize those benefits and reductions in a way that aids reporting frameworks in a broader market. The LCA model (applied in such a manner as Argonne National Lab's GREET model) should be used to report emissions in the same fashion that the Inflation Reduction Act allows.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 38

Comment Excerpt: As EPA has acknowledged in the preamble to the supplemental proposal, this method of reporting energy consumption does not provide the EPA with information on renewable energy credits (RECs) that allows reporters to net Scope 2 emissions commensurate with purchased and retired RECs. The lack of data collection and transparency on renewable energy attributes may inadvertently disincentivize the purchase of renewable energy altogether. The Industry Trades recommend that in addition to reporting the energy consumption, that EPA allows reporters to voluntarily report the amount of energy that is sourced from retired RECs or a renewable energy purchase agreement. This will provide the public and other stakeholders with a more complete picture of overall GHG emissions intensity.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 44

Comment Excerpt: As proposed, Subpart B provisions for thermal energy reporting only address the purchased energy, which may not represent the energy consumed on-site. The Industry Trades propose reporting this information on a facility wide net-energy basis. Many facilities that purchase steam also return condensate, which has embodied energy that is not consumed at the purchaser's facility. Also, some facilities that utilize electrical and/or thermal energy from a provider may pass through some of the energy purchased to a third party. In order for EPA to understand the energy consumed at the facility, both thermal energy purchased and condensate returned or energy passed through need to be understood. The Industry Trades believe that reporting this information on a net-energy use basis will provide clearer information regarding thermal energy usage.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 17

Comment Excerpt: EPA must extend the reporting deadline for Subpart B due to normal billing cycles. As it is currently proposed, Subpart B will require annual purchases of electricity and thermal energy products to be reported by March 31st for the previous year, consistent with other GHGRP subparts. Billing records for the previous year are not available early enough to allow sufficient time for the required information to be compiled, allocated, reviewed, and put into a reporting format prior to March 31st. Most end-year billing cycles will straddle December and January (including from late December through late January). Because it takes time for bills to reach reporters (or their billing management vendors) and to be entered in a database and QA/QC'd, final billing records will not be available until after March 31st. This will result in operators reporting estimated usage for the last billing cycle of each year and submitting a revised final report at a later date, resulting in an additional reporting burden to estimate missing data and then amend data and resubmit reports. Additionally, utility bills are often disputed. It is

expected that annual purchases of electricity and thermal energy products, summed from individual billing records, will change after March 31, thus requiring resubmittal of a revised report.

In consideration of these issues, EPA should extend the reporting deadline for Subpart B to May 31st at the earliest to ensure that data reported under Subpart B accurately reflects actual annual total purchased electricity and thermal energy products and does not burden reporters with resubmittals. By this date, most (but not all) year-end data should be available with a reasonable amount of time for compilation, allocation, and review.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.26 should delay the reporting deadline, for the reason of: extend Subpart B deadline due to normal billing cycles.]

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 28

Comment Excerpt: If a facility is acquired, EPA must clarify that reporters are not responsible for updating Subpart B reported data for reporting years that occurred prior to the acquisition. EPA often asks reporters to update reports as many as five or more years in the past. This is especially difficult, if not impossible, when a facility was acquired and EPA requests data that pre-dates the acquisition. EPA should clearly indicate in Subpart B that reporters are not responsible for addressing data that pre-dates their ownership.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Class of ’85 Regulatory Response Group
Commenter Type: Other
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0329-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA has not addressed whether the energy consumption and electricity purchase reporting requirements apply to purchased electricity generated by renewable sources that do not produce GHGs. While the Class of ’85 acknowledges that EPA is seeking “to better

understand the energy intensity of the facilities and sectors reporting to the [GHG Reporting Rule], and energy intensity is independent from energy attributes,"[4] renewable energy does not generate the GHG emissions that are the subject of the GHG Reporting Rule. The Class of '85 requests that EPA clarify when the additional reporting requirements in this section would apply, and urges EPA not to impose new reporting obligations unrelated to GHG emissions.

Footnotes

[4] Id. at 32,891.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Class of '85 Regulatory Response Group
Commenter Type: Other
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0329-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA has not addressed whether these requirements apply to electric generating companies purchasing electricity from Independent Power Producers ("IPPs") for sale. That information likely is reported separately by the IPPs, making reporting by the purchasers redundant and leading to overreporting.

If EPA nonetheless determines that electric generating companies must report purchased electricity, EPA should allow the information on purchased electricity to be reported on a company-wide basis rather than by facility. Some contracts with IPPs are tracked on a company-wide basis and this information is not broken down for each facility within the company. Accordingly, if EPA were to require facility-specific reporting, companies would be forced to reorganize contracts and develop new data, significantly increasing the costs for compliance with the GHG Reporting Rule.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council (ACC) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0325-A1
Comment Excerpt Number: 6

Comment Excerpt: EPA woefully underestimates the time and cost associated with incorporating new recordkeeping and reporting requirements into place, particularly where the information being reported may be sensitive competitive information. For example, EPA estimates first-year labor costs per respondent of $1,119 for subpart B – Energy Consumption.[13] This estimate is too low; it appears to presume no need to confer with suppliers, amend purchase agreements, and revise data collection forms and systems. Even if only some of the affected respondents undertake these actions, EPA's estimate would exceed its estimate.

It is because of these concerns that OMB's PRA guidance wisely calls for consultation with representatives of those from whom information is to be obtained:

"Describe efforts to consult with persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported. Consultation with representatives of those from whom information is to be obtained or those who must compile records should occur at least once every 3 years - even if the collection of information activity is the same as in prior periods. There may be circumstances that may preclude consultation in a specific situation. These circumstances should be explained."[14]

There is no indication that the Agency undertook consultation with external parties on its burden estimates. EPA should have undertaken this exercise before drafting its proposed rule. Having failed to do so, it must take extra care to carefully consider public comments from affected parties relating to burden estimates in its proposal and amend these estimates accordingly.

Footnotes

[13] Id. at 22. 54.

[14] Government Services Administration, Creating a Supporting Statement Part A, available at https://pra.digital.gov/uploads/supporting-statement-a-instructions (last visited July 21, 2023) (PRA Guidance at 1).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.10 Comments on specific source category definitions

Commenter Name: James D.W. Roush
Commenter Affiliation: CMS Energy Corporation
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0307-A1
Comment Excerpt Number: 6

Comment Excerpt: Consumers offers the following changes, denoted in bold italic text, to the definitions to seek clarity and consistency in the proposed reporting requirements.

"Purchased electricity means metered electricity that is delivered by a separate electricity delivery service provider to a facility subject to this subpart."

The change to this definition is necessary as Consumers Energy, as an electricity delivery service provider, provides metered electricity to many of our own assets within our electric service territory. In these scenarios we do not generate billing statements / purchase contracts for "purchasing" electricity from within our own Company.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.11 Other comments on accounting for energy consumption (not specified in other codes)

Commenter Name: Debra J. Jezouit
Commenter Affiliation: Class of '85 Regulatory Group
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0250-A1
Comment Excerpt Number: 2

Comment Excerpt: Regardless of how the source categories ultimately are defined, it will be extremely difficult for many facilities to report this data. For companies that are part of Regional Transmission Organizations ("RTOs"), such as PJM, when electricity is imported there is limited information as to whether the megawatts came from coal, gas, solar, or any other power source. Requiring facilities to identify every potential source category from which their energy is imported is unlikely to be feasible or, at the least, would be burdensome and lead to inaccurate reporting.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Leslie Ritts
Commenter Affiliation: National Environmental Development Associations Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0213-A1
Comment Excerpt Number: 4

Comment Excerpt: NEDA/CAP has some concern about the nature of the RFCs regarding GHGRP energy consumption reporting, which the EPA proposed but did not adopt in 2009. See id, at 37,017 ("[S]uch a future data collection on indirect emissions would complement the EPA's interests in energy efficiency and renewable energy." See 74 Fed Reg. 56,288—56,289, (Oct. 30, 2009)). Because of the placement of these RFCs at the back of the June 21, 2022 NPRM and because of the absence of proposed codified regulatory language in this Notice, we understand that the agency is requesting comment on possible future regulations regarding an issue, and we therefore respond accordingly, emphasizing that supplemental rulemaking would be necessary before such requirements could be finalized. NEDA/CAP also observes that the

Securities and Exchange Commission proposed earlier this year, to require GHG emissions related to energy consumption information be included in reports from registrants (*i.e.*, publicly-owned companies registered under the Securities Exchange Act). 87 Fed. Reg. 21,344 (Apr. 11, 2022) Therefore, if the SEC finalizes this public reporting requirement, any future EPA regulation should be aligned with that of the SEC requirement for publicly-traded companies to minimize public confusion and the costs associated with collection of the requested GHGs associated with Scope 2 emissions reporting.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Karen Knutson
Commenter Affiliation: Chevron
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0184-A1
Comment Excerpt Number: 6

Comment Excerpt: While EPA likely already receives direct, or Scope 1, GHG emissions data associated with the electricity and thermal resources from sectors like power plants, Chevron acknowledges there may be additional value for Scope 2 reporting across sectors to help understand and benchmark performance. As part of our Scope 2 emissions reporting journey for voluntary disclosures, we have identified several factors that we believe are key for the successful implementation of such requirements at the national level:

- When sufficient information is available, we believe reporters should use a market-based approach for Scope 2 emissions reporting and be able to include emissions reductions associated with retired renewable energy certificates (RECs) that are applied to the specific GHGRP facility for which emissions are reported.
- Given some companies have limited experience reporting Scope 2, we believe there should be an option to use the location-based approach, which is less information intensive. Emission factors for this approach for electricity use could come from sources such as the "PowerProfiler" tool that EPA publishes.
- We believe facility-level applicability thresholds should continue to be based on direct, Scope 1 emissions. In our view, EPA emission visualization tools like FLIGHT should clearly make the distinction between Scope 1 and 2 emissions at the facility.
- We believe that national emission estimates like the U.S. GHG Inventory should continue to be based on direct emissions by sector (Scope 1) to avoid double counting of emissions at the country level.

To be consistent with other reporting under the GHGRP, we recommend that purchased energy products be reported in terms of GHG emissions rather than energy use.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 40

Comment Excerpt: EPA's definition of "Substantive Error[4]," which would trigger resubmittal of applicable GHG reports, is overly broad for this subpart as it does not have a de minimis threshold. There can be adjustments to energy consumption records several months following the closing period of the billing cycle. These adjustments could result in an operator having to re-submit reports previously certified even if the adjustment does not result in a significant change in the reported energy consumption. This is especially problematic for the oil and natural gas industry because of the huge number of meters potentially subject to Subpart B, the large number of meters, adjustments, etc. which may not have a substantive impact on overall energy consumption. The Industry Trades request that EPA does not subject Subpart B reports to the "Substantive Error" provisions, as defined in 40 CFR Part 98 Subpart A.

Footnotes

[4] Substantive error, as defined in 40 CFR 98.3(h) means, "an error that impacts the quantity of GHG emissions reported or otherwise prevents the reported data from being validated or verified."

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 14

Comment Excerpt: EPA must clarify that reporters cannot be held accountable for any errors in purchased metered energy use. Reporters are not in control of this equipment or any related data, and EPA cannot hold reporters accountable for the accuracy of this third-party information.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 19

Comment Excerpt: EPA should also define what magnitude of change in purchased electricity and thermal energy products necessitates a report resubmittal. Even after May 31st, a bill dispute may be resolved resulting in a different annual energy use. To avoid frequent, likely insignificant, report resubmittals, EPA should define a minimum magnitude of change to require a report resubmittal. GPA suggests 5% change in the total facility energy use would be appropriate.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 29

Comment Excerpt: EPA once again grossly underestimates the burden of the GHGRP. GPA has commented repeatedly about EPA's extreme underestimation of the burden imposed on reporters for the GHGRP, and we find ourselves here again as EPA estimated a miniscule initial $1,119 per facility per year reporting burden, and $600 annually thereafter.[39] As described above in our comments, EPA is requesting a huge amount of information for gathering and processing reporters, which does not seem to be contemplated in the burden assessment, and EPA should simplify Subpart B and eliminate most requirements. Doing so will reduce the cost burden of this rule and bring it closer to EPA's estimate. But, as proposed, the burden of this rule is at least ten times higher than EPA has estimated, driven by monthly reporting, reporting of thousands of small use meters, mandated allocation, expected perfection of billing data, and the impracticable task of gathering records on equipment that the reporter neither owns, operates, or maintains.

Additionally, especially for basin-wide reporters (gathering and boosting, production), not all reporters have billing data associated with the physical location of the meter and so are not prepared to associate meter/electricity data with GHGRP "facilities." Because these reporters have hundreds or thousands of these meters, this will be an enormous effort; something like 100-300 hours per reporter to field verify meter physical zip code and update (or create) a billing records database. This is another reason small use meters should be exempt from Subpart B. As noted in a previous comment, many midstream companies used a third party just to manage power bills because the number of records is so significant. EPA does not contemplate this or

any efforts that might be needed to update third party databases and potentially adjust contracts such that the vendor can ensure the data perfection EPA seeks.

In the preamble, EPA says, "[t]he EPA understands that contracts between host facilities and energy producers are governed by clear metering and billing requirements. Accordingly, we are seeking comment on our understanding that monitoring and recordkeeping systems are already in place for purchased energy transactions, and our assessment that the incremental reporting burden would be minimal." What EPA is asking for is vastly above and beyond the normal management of electricity usage/billing data for GPA members. As described, oil and gas reporters have thousands of meters, 90%+ of which have small usage, and companies do not have the bandwidth to keep the types of records EPA appears to believe already exist for this large population of meters. As such, and as described above, EPA's assessment of the reporting burden is wildly incorrect.

[Per the above comment, the commenter identified in a table in appendix b of the comment letter, the proposed requirements at 98.24(a)(2)(4), 98.24(a)(5)(i)(ii)(iii), 98.24(a)(5)(iii)(A)(B)(C), 98.24(b), 98.24(b)(1)(2)(3), 98.25, 98.26(a)(b)(c)(e)(g)(h)(i)(k)(l)(m), 98.26(m)(1)(2)(3) be removed, 98.26(d)(1), 98.26(f), 98.27(a)(b)(c) be changed or removed, 98.26(j)(1)(2) and 98.26(j)(3)(i)(iii) be changed, 98.25 be removed/reduced, for the reason of: underestimate of burden.]

Footnotes

[39] Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule, Table A–3

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

4.12 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart B

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 33

Comment Excerpt: If concerns about disclosure of confidential business information from reporting the quantities and attributes of purchased electricity and other forms of energy were to arise, EPA could address those issues in a later rulemaking, consistent with the agency's past practice.[244] It will be important to ensure that EPA's reporting requirements do not discourage entities' efforts to improve energy efficiency or transition to fully electrified processes.

Footnotes

[244] See 74 Fed. Reg. at 56,289 (indicating that EPA would determine, in a subsequent rulemaking, whether data on electricity purchases could be withheld from publication as confidential business information).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 32

Comment Excerpt: If concerns about disclosure of confidential business information from reporting the quantities and attributes of purchased electricity and other forms of energy were to arise, EPA could address those issues in a later rulemaking, consistent with the agency's past practice. See 74 Fed. Reg. at 56289 (indicating that EPA would determine, in a subsequent rulemaking, whether data on electricity purchases could be withheld from publication as confidential business information). It will be important to ensure that EPA's reporting requirements do not discourage entities' efforts to improve energy efficiency or transition to fully electrified processes.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Kimberly S.L. Bauman
Commenter Affiliation: Mississippi Lime Company
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0297-A1
Comment Excerpt Number: 2

Comment Excerpt: We request that EPA continue to allow the below critical Subpart B elements to be held as confidential, as indicated in EPA's May 2, 2023 memorandum titled *Proposed Confidentiality Determinations and Emission Data Designations for Data Elements in Proposed Supplemental Revisions to the Greenhouse Gas Reporting Rule* (Docket EPA-HQ-OAR-2019-0424).

- The annual quantity of purchased electricity (98.26(j)(1)),
- The annual quantity of purchased thermal products (98.26(j)(2)),

- The rate descriptor for each electricity billing statement (*i.e.*, the price paid, the type of service being delivered, and if the consumer is being rewarded for shifting loads to off-peak hours) (98.26(k)),
- The decimal fraction of purchased electricity or thermal energy products attributable to each subpart (98.26(1)), and
- Electronic copy of all pages of one billing statement per energy delivery service provider of purchased electricity or thermal energy products (98.26(m)).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Joseph D'Ath
Commenter Affiliation: National Lime Association (NLA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0304-A1
Comment Excerpt Number: 2

Comment Excerpt: Also, in the proposal, the following subpart B elements are eligible for confidentiality treatment:

- The annual quantity of purchased electricity (98.26(j)(1))
- The annual quantity of purchased thermal energy products (98.26(j)(2))
- The rate descriptor for each electricity billing statement (*i.e.*, the price paid, the type of service being delivered, and if the consumer is being rewarded for shifting loads to off peak hours) (98.26(k))
- The decimal fraction of purchased electricity or thermal energy products attributable to each subpart (98.26(l))
- Electronic copy of all pages of one billing statement per energy delivery service provider of purchased electricity or thermal energy products (98.26(m))

Purchased electricity data may reveal sensitive operational information about the facility such as operating rates and capacity utilization, operating costs, electric loads, and time of use. Therefore, NLA supports the confidentiality determinations identified above.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Matt Hite
Commenter Affiliation: GPA Midstream Association

Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0327-A1
Comment Excerpt Number: 30

Comment Excerpt: While we do not support most of the proposed Subpart B reporting requirements, we do agree with the proposed confidentiality determinations. To the extent EPA finalizes the proposed reporting requirements of § 98.26, EPA should treat data as confidential as proposed in "Proposed Confidentiality Determinations and Emission Data Designations for Data Elements in Proposed Supplemental Revisions to the Greenhouse Gas Reporting Rule."

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 14

Comment Excerpt: The addition of this subpart and its requirements would only serve to further complicate the reporting and understanding of indirect emissions. No other industry or NGO emissions reporting programs, such as the Global Reporting Initiative, use electricity purchasing and default grid mixes to calculate indirect emissions, and the Association believes that the EPA's methodology will result in inconsistent and inaccurate indirect emission estimations made by the Agency and public. Due to the accessibility of this misinformation and sensitive business information regarding operational efficiencies and trade secrets, the Association requests that all data elements reported under the subpart be given confidential treatment, notwithstanding the Association's request for EPA to retract the proposed subpart.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Not provided
Commenter Affiliation: Theresa Pugh Consulting, LLC
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0295-A1
Comment Excerpt Number: 1

Comment Excerpt: The EPA has asked in proposed rule for comment on the impacts of disclosure of non-emission data. The commenter offers that the EPA does not have the authority

under the Clean Air Act Amendments of 1990 to ask for energy use data or how energy resources are obtained. The EPA has authority to ask about emissions and not about energy use.

The EPA staff know, especially in the Office of Air, that asking about energy use is a step into asking about confidential business operations, purchasing and where the manufacturer obtains their fuel. This is a serious breach into collecting information that can allow competitor corporations to "reverse engineer" or for countries that do not share our same national interests to see where many of the nation's manufacturing sectors and energy users obtain their fuel(s). Neither is a smart move.

Recently Congress passed the CHIPS Act and Inflation Reduction Act with strong encouragement from the Biden Administration. Both of these new law sends market signals to many types of industries that will buy many types of fuels and use those fuels as feedstocks to make products. Other companies will balance out whether they should buy mostly electricity through a local power generator or buy natural gas directly from a natural gas producer/supplier. These options need to be retained by these companies without concerns that their energy purchasing options or use is obtainable by parties who would use that information against them. Since the information is not to be obtained to directly assess GHG emissions there is no reason for EPA to obtain the information.

Based upon the passage of CHIPS and IRA there have been approximately 191 new factories or expansions of existing factories to build a wide variety of products. The owners of these new factories select locations based upon many factors: proximity to end users, transportation proximity (surface shipping, rail, barge), distribution centers, related processing facilities for other raw materials, cost of land, local taxes, and cost of energy. The last thing that many of these companies want the energy providers to know is all the details about what volume, price and timing of delivery of their buy energy resources. EPA's attempts to collect this data eliminates the confidentiality of this information. This could be especially difficult for the companies that will be making products with natural gas. According to the DOE there are currently there are more than 6,000 products made from natural gas. These range from everything from pharmaceuticals, movie films, packaging, tires, tool racks, roofing, plastic toys, nail polish, fertilizer, inks, food preservatives, glycerin (including for food sector), artificial limbs (prosthetic devices), cortisone and EV car battery cases.

Asking the companies in the table [See submittal EPA-HQ-OAR-2010-0424-0295-A1 for table, which lists the potentially affected industrial sectors anticipating new factory building across 39 states and existing factory expansions with sensitive energy use/cost data including aluminum, ammonia, CO_2 in EOR, cement, electronics and semiconductor manufacturing, electrical equipment manufacture and refurbishment, EGUs, and glass] below is one of the reasons that these new companies projected to be built between 3Q2023 and 2030 that we need will be forced to disclose non-emission related energy supply use. This data is harmful to their economic best interests. And the reporting does nothing to improve GHG emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

Commenter Name: Paul Balserak
Commenter Affiliation: American Iron and Steel Institute (AISI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0316-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA's proposal to require reporting of energy consumption emissions raises concerns regarding confidentiality. EPA proposes that a determination will be made in the upcoming final rule as to whether certain data elements would be treated as confidential. This approach is in contrast with other Clean Air Act rules where confidentiality claims are assessed on a case-by-case basis.

The industry simply cannot anticipate confidentiality concerns that may exist years from now in the reporting of energy consumption based on EPA's proposal alone. Just one example from EPA's proposal will highlight this concern. In 88 FR 32889, EPA would require submission of "a copy of a representative billing statement for each existing or new energy purchasing agreement between two counterparties. This information would ensure that all reported quantities of energy consumed are consistent with the periodic billing statements." This requirement to provide records of billing statements as a matter of GHGRP reporting raises concerns for the Iron and Steel industry. Additionally, the energy sector is going through significant changes for a host of reasons. The reporting of energy consumption emissions will be increasingly complicated, making projections of confidentiality even more challenging.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 29 in section 4.1 of this document.

5.0 Comments on Subpart C of Part 98

5.1 Revisions to modify Tier 3 Calc Methodology (Equation C–5)

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 38
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: The proposed revisions to variable "MW" of Equation C–5 for use in the Tier 3 Calculation Methodology includes an incorrect reference to new sections that are not in the proposed regulatory changes. The proposed definition for MW is "Annual average molecular weight of the gaseous fuel (kg per/mole). The annual average molecular weight shall be determined using the procedures specified in paragraphs (a)(3)(iii)(A)(3) and (a)(3)(iii)(A)(4) of this section." As no such paragraphs exist, the correct paragraphs to reference are (a)(3)(iii)(B)(1) and (a)(3)(iii)(B)(2).

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

5.2 Revisions for calculation of biogenic emissions from tire combustion

Commenter Name: Sean O'Neill
Commenter Affiliation: Portland Cement Association (PCA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0211-A1
Comment Excerpt Number: 3

Comment Excerpt: As outlined in the Federal Register notice of the Proposed Rule, PCA worked with its members and the U.S. Tires Manufacturing Association (USTMA) to outline that the default biogenic factor of TDF should be raised from its current level of 0.20 to 0.24.[4] The increased default factor, based on updated data submitted by USTMA, and TDF data, submitted by Mitsubishi Cement, represented the weighted average composition of natural rubber in tires, which is 24%.[5] EPA is correct in using this weighted average as it is more accurate than the arithmetic average that was used to calculate the default biogenic factor of 0.20 in the 2010 GHG Reporting Rule.[6] As a result, PCA supports the increase in the default biogenic factor from 0.20 to 0.24 within Subpart C in the Proposed Rule and encourages EPA to retain the provision in the final rule.

Footnotes

[4] 87 Fed. Reg. 36920, 36937-38

[5] 87 Fed. Reg. at 36938

[6] Id.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 11

Comment Excerpt: EPA proposes that users of tire-derived fuel (TDF) report biogenic emissions separately by relying on an updated default factor: 0.24. Given the 24% natural rubber average in the scrap tire stream, as calculated by the U.S. Tire Manufacturers Association, and supported by emission test data submitted by the Portland Cement Association, the biogenic emissions from TDF should be reported separately.

40 CFR 98.34(e) - We request that EPA expand the last sentence of this provision to include all combined biomass and fossil fuels and to allow for testing at one source when a common fuel is

combusted. EPA specifies quarterly ASTM D6866-16 and ASTM D7459-08 testing to determine the biogenic portion of combined biomass and fossil fuels. The last sentence of this paragraph allows for testing of one representative unit for a common fuel source for tire combustion only. In some cases, facilities could have dozens of combustion units that burn the same fuel, and testing each source quarterly would impose unnecessary burdens and safety hazards on entities without enhancing accuracy.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 5

Comment Excerpt: The Industry Trades also propose that the EPA provide clarification and flexibility to 98.34(e), which references 98.34(d) to determine the biogenic portion of CO_2 emissions. Since gaseous fuels can be sampled prior to combustion for biogenic content and used to determine the biogenic portion of CO_2 emissions, the Industry Trades propose the following additional language (in red) to provide options to use other approved sampling standards or industry standard practices:

"(e) For other units that combust combinations of biomass fuel(s) (or heterogeneous fuels that have a biomass component, *e.g.*, tires) and fossil (or other non-biogenic) fuel(s), in any proportions, ASTM D6866-16 and ASTM D7459-08 (both incorporated by reference, see § 98.7) may be used to determine the biogenic portion of the CO_2 emissions in every calendar quarter in which biomass and non-biogenic fuels are co-fired in the unit. Follow the procedures in paragraph (d) of this section. As an alternative to ASTM D7459-08 and paragraph (d), an entity may also use a method published by a consensus-based standards organization, if such a method exists, or you may use industry standard practice. The method(s) used shall be documented in the GHG Monitoring Plan required under 98.3(g)(5). If the primary fuel for multiple units at the facility consists of tires, and the units are fed from a common fuel source, testing at only one of the units is sufficient."

Response: This comment is out of scope for this rulemaking. The EPA did not propose and is not taking final action in this rule on alternative sampling standards for determination of the biogenic portion of CO_2 for gaseous fuels. The EPA may consider this in a future rulemaking.

Commenter Name: Sean O'Neill
Commenter Affiliation: Portland Cement Association (PCA)
Commenter Type: Industry Trade Association

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0211-A1
Comment Excerpt Number: 9

Comment Excerpt: PCA also supports the elimination of the ASTM testing threshold for determining biogenic CO_2 emissions from the combustion of TDF and other alternative fuels in Subpart C of the Proposed Rule. Under the current rule, manufacturers that combust TDF for more than 10% of their total fuel source, are required under Part 98 to conduct quarterly flue-gas testing using ASTM methods to determine biogenic CO_2 emissions. The imposition of the ASTM testing threshold for those cement kilns that utilize TDF for more than 10% of their total fuels, complementing the industry's goal of decarbonization, presents an undue burden on the industry reporting its biogenic CO_2 emissions to EPA under the GHG Reporting Rule.

For the above reasons, PCA supports the elimination of the ASTM testing threshold for the reporting of biogenic CO_2 emissions from TDF and other alternative fuels and also supports the use of the default biogenic factor of 0.24 for determining biogenic CO_2 emissions as it will ensure accurate reporting of emissions while also minimizing the industry's reporting burden. Therefore, PCA supports the proposed requirement to report biogenic CO_2 emissions using the proposed updated default biogenic rate for TDF of 0.24 if the requirement to report CO_2 emissions using ASTM methods is eliminated.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

5.3 Revisions to report unit level information for the aggregation of units and common pipe configuration

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 40
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: API asserts that the proposed reporting requirements under § 98.36(c)(1)(ii) should also apply to common stack units or Part 75 units, to ensure consistency and clarity for reporters.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)

Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 2

Comment Excerpt: We agree that unit-specific data is key to understanding not only the distribution of emissions across unit types and sizes, but also the greenhouse gas abatement potential through various decarbonization strategies. Certain emissions controls may prove more cost-effective for large sources. Furthermore, certain abatement strategies may be better suited for certain unit types and uses, but this important data is currently obscured. Unit-specific information on unit type, size, and share of heat input could assist EPA in developing new source performance standards (NSPS) and emission guidelines for existing sources under Clean Air Act section 111. Developing NSPS and emission guidelines are among the purposes expressly mentioned in Clean Air Act section 114, which broadly authorizes EPA to adopt reporting requirements that would facilitate the agency's implementation of the Act.[8]

The data EPA has proposed to collect is essential and would fill a large gap in the identification and characterization of the sources of various industrial subsectors' emissions. For instance, using 2014 data from the GHGRP[9], approximately 58% (65 $MMTCO_2$) of emissions reported in the Chemical Manufacturing subsector (NAICS code 325) are listed as "other combustion source" (OCS), a designation used when facilities are reporting aggregation of units or common pipe configurations. Other industrial subsectors have similarly large percentages of emissions from uncharacterized combustion sources:

Subsector	Total CO_2 Emission in 2014 (MMT)	% of CO_2 Emissions from OCS Units
Petroleum and Coal Products Manufacturing	127	64%
Chemical Manufacturing	112	58%
Oil and Gas Extraction	62	77%
Primary Metal Manufacturing	66	53%
Food Manufacturing	35	58%
Glass Manufacturing	5	49%
Lime Manufacturing	10	48%

Obscuring the types, sizes, and heat inputs of the individual sources responsible for such a large share of this category's emissions renders EPA's task in regulating them difficult.

Among the sources reporting under subpart C, combined configurations account for a large proportion of emissions. EPA observes that the "Aggregation of Units" and "Common Pipe" configurations together account for 50% of emissions, which is more than the 45% accounted for by individual units.[10] Adding the "Common Stack" and "Alternative Part 75" configurations would cover the remaining 4% of emissions under this subpart, ensuring that all emissions under this subpart are covered.[11] Although they do not account for a large share of emissions, it would

be reasonable to require owners and operators of sources in the latter two configurations—which together comprise just over 200 configurations—to report the same data. This approach would impose consistent requirements on all stationary combustion sources, providing EPA and stakeholders with a complete picture of the greenhouse gas abatement potential of various source categories. And, as noted above, none of the requested information on unit type, size, or annual heat input should be difficult to obtain and report. We therefore urge EPA to adopt the same requirements for the common stack and part 75 configurations.[12]

The extension of unit-level reporting requirements recommended in these comments is reasonable, based on its content and scope. As EPA notes, owners and operators must already report the maximum rated heat input for an aggregation of units, which would involve summing the maximum rated heat input of individual units.[13] The share of total annual heat input should be available in company records.[14] And none of the requirements to report individual unit characteristics would sweep in facilities that are not already subject to the GHGRP, based primarily on the facility's subcategory and emissions.[15] This requirement will add little burden to reporters while providing EPA and stakeholders with important information.

Footnotes

[8] 842 U.S.C. § 7414(a)(1).

[9] Colin McMillan, Nat'! Renewable Energy Lab., Industrial Facility Combustion Energy Use (2016), https://data.nrel.gov/submissions/50.

[10] 87 Fed. Reg. at 36,939.

[11] See id.

[12] See id. (seeking comment on this topic).

[13] 87 Fed. Reg. at 36,939-40.

[14] See id. at 36,940.

[15] See 40 C.F.R. § 98.2(a).

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 1

Comment Excerpt: We support EPA's proposal to require general stationary fuel combustion sources to report the unit type, maximum rated heat input, and an estimate of the share of total annual heat input for each unit, including those in either an aggregation of units or common pipe configurations. 87 Fed. Reg. at 36939. These requirements also should be extended to owners and operators reporting emissions for common stack configurations under 40 C.F.R. § 98.36(c)(2) or the alternative part 75 configuration under 40 C.F.R. § 98.36(d). In addition, we

recommend that EPA require data on the installation year of individual combustion units and the typical operating-temperature range and output type (*i.e.*, water, steam, or other) of each unit.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment. The EPA did not propose or request comment on the reporting requirements raised by commenters, specifically the year of unit installation, the typical operating-temperature range, and the output type of the combustion unit, and is not taking final action in this rule on those requested revisions. The EPA may consider these changes in a future rulemaking.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 2

Comment Excerpt: We agree that unit-specific data is key to understanding not only the distribution of emissions across unit types and sizes, but also the GHG abatement potential through various decarbonization strategies. Certain emissions controls may prove more cost-effective for large sources. Furthermore, certain abatement strategies may be better suited for certain unit types and uses, but this important data is currently obscured. Unit-specific information on unit type, size, and share of heat input could assist EPA in developing new source performance standards (NSPS) and emission guidelines for existing sources under CAA section 111. Developing NSPS and emission guidelines are among the purposes expressly mentioned in CAA section 114, which broadly authorizes EPA to adopt reporting requirements that would facilitate the agency's implementation of the Act.

The data EPA has proposed to collect is essential and would fill a large gap in the identification and characterization of the sources of various industrial subsectors' emissions. For instance, using 2014 data from the GHGRP, approximately 58% (65 $MMTCO_2$) of emissions reported in the Chemical Manufacturing subsector (NAICS code 325) are listed as "Other combustion source" (OCS), a designation used when facilities are reporting aggregation of units or common pipe configurations. Other industrial subsectors have similarly large percentages of emissions from uncharacterized combustion sources:

Subsector	Total CO_2 Emissions (MMT)	% of CO_2 Emissions from OCS Units
Petroleum and Coal Products Manufacturing	127	64%
Chemical Manufacturing	112	58%
Oil and Gas Extraction	62	77%
Primary Metal Manufacturing	66	53%
Food Manufacturing	35	58%

Glass Manufacturing	5	49%
Lime Manufacturing	10	48%

Obscuring the types, sizes, and heat inputs of the individual sources responsible for such a large share of this category's emissions renders EPA's task in regulating them difficult.

EPA observes that the "Aggregation of Units" and "Common Pipe" configurations together account for 50% of emissions, which is more than the 45% accounted for by individual units. 87 Fed. Reg. at 36939. Adding the "Common Stack" and "Alternative Part 75" configurations would cover the remaining 4% of emissions under this subpart, ensuring that all emissions under this subpart are covered. See id. Although they do not account for a large share of emissions, it would be reasonable to require owners and operators of sources in the latter two configurations—which together comprise just over 200 configurations, id.—to report the same data. This approach would impose consistent requirements on all stationary combustion sources, providing EPA and stakeholders with a complete picture of the GHG abatement potential of various source categories. And, as noted above, none of the requested information on unit type, size, or annual heat input should be difficult to obtain and report. We therefore urge EPA to adopt the same requirements for the common stack and part 75 configurations.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA should consider lowering the size threshold for reporting unit characteristics below the 10 MMBtu/hr that EPA has proposed to retain.[16] A lower threshold would be reasonable because the full set of data on individual stationary combustion sources is crucial to assessing abatement potential from various industrial subsectors. Numerous stationary combustion sources including boilers deployed across a wide range of industrial subsectors are smaller than 10 MMBtu/hr.[17] In the case of industrial boilers, although these smaller boilers do not account for a large share of total capacity,[18] they often present the most viable opportunities for greenhouse gas emissions abatement including through electrification with heat pump technology.[19] Similarly, combustion units at natural gas compressor stations and storage facilities frequently do not meet a reporting threshold of 10 MMBtu/hr, meaning information on these units' characteristics is unavailable.[20] In 2016, EPA ultimately declined a recommendation to lower the threshold to 2.5 MMBtu/hr, noting that "lowering the proposed threshold to 2.5 MMBtu/hr, as opposed to 10 MMBtu/hr, would increase burden without significantly increasing the EPA's ability to verify emissions data."[21] The present objective, however, is not to check

emissions data against aggregate capacity, which can be accomplished even while disregarding emissions from smaller sources.[22] Rather, it is to evaluate emission abatement opportunities across the universe of combustion sources, and omitting smaller sources may leave out some of the more cost-effective solutions. The low burden of additional reporting requirements and the paramount goal of reducing greenhouse gas emissions from combustion sources mean EPA should lower or eliminate the threshold to report unit characteristics.

Footnotes

[16] 87 Fed. Reg. at 36,939.

[17] See Carrie Shoeneberger et al., Electrification potential of U.S. industrial boilers and assessment of the GHG emissions impact, 5 Adv. In Applied Energy 100089, at 5, Fig 3 (2022). More than 20,000 industrial boilers— approximately 53% of the boilers examined in this study—were smaller than 10 MMBtu/hr.

[18] See id.

[19] See Edward Rightor, Andrew Whitlock & R. Neal Elliott, Am. Council for an Energy Efficient Econ., Beneficial Electrification in Industry, at 15 (July 2020), https://www.aceee.org/sites/default/files/pdfs/ie2002.pdf.

[20] See AGA Comments on Proposed Rule: 2015 Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule, 81 Fed. Reg. 2536 (January 15, 2016), EPA-HQ-OAR-2015-0526-0071, at 2-3.

[21] 81 Fed. Reg. at 89,188, 89,204 (Dec. 9, 2016).

[22] See id. at 89,203.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 3

Comment Excerpt: The extension of unit-level reporting requirements recommended in these comments is reasonable, based on its content and scope. As EPA notes, owners and operators must already report the maximum rated heat input for an aggregation of units, which would involve summing the maximum rated heat input of individual units. 87 Fed. Reg. at 36939-40. The share of total annual heat input should be available in company records. See id. at 36940. And none of the requirements to report individual unit characteristics would sweep in facilities that are not already subject to the GHG Reporting Rule, based primarily on the facility's subcategory and emissions. See 40 C.F.R. § 98.2(a). This requirement will add little burden to reporters while providing EPA and stakeholders with important information.

On the other hand, EPA should consider lowering the size threshold for reporting unit characteristics below 10 MMBtu/hr, which EPA has proposed to retain. 87 Fed. Reg. at 36939.

This is a reasonable reporting requirement because the full set of data on individual stationary combustion sources is crucial to assessing GHG abatement potential from various industrial subsectors. Numerous stationary combustion sources including boilers deployed across a wide range of industrial subsectors are smaller than 10 MMBtu/hr.[4] In the case of industrial boilers, although these smaller boilers do not account for a large share of total capacity,[5] they often present the most viable opportunities for GHG emissions abatement including through electrification with heat pump technology.[6] Similarly, combustion units at natural gas compressor stations and storage facilities frequently do not meet a reporting threshold of 10 MMBtu/hr, meaning information on these units' characteristics is unavailable.[7] In 2016, EPA ultimately declined a recommendation to lower the threshold to 2.5 MMBtu/hr, noting that "lowering the proposed threshold to 2.5 MMBtu/hr, as opposed to 10 MMBtu/hr, would increase burden without significantly increasing the EPA's ability to verify emissions data." 81 Fed. Reg. 89188, 89204 (Dec. 9, 2016). The present objective, however, is not to check emissions data against aggregate capacity, which can be accomplished even while disregarding emissions from smaller sources. See id. at 89203. Rather, it is to evaluate GHG abatement opportunities across the universe of combustion sources, and omitting smaller sources may leave out some of the more cost-effective solutions. The low burden of additional reporting requirements and the paramount goal of reducing GHG emissions from combustion sources mean EPA should lower or eliminate the threshold to report unit characteristics.

Footnotes

[4] See Carrie Shoeneberger et al., Electrification potential of U.S. industrial boilers and assessment of the GHG emissions impact, 5 Advances in Applied Energy 100089, at 5, Fig. 3 (2022). More than 20,000 industrial boilers— approximately 53% of the boilers examined in this study—were smaller than 10 MMBtu/hr.

[5] See id.

[6] See Edward Rightor, Andrew Whitlock & R. Neal Elliott, Am. Council for an Energy Efficient Econ., Beneficial Electrification in Industry, at 15 (July 2020), https://www.aceee.org/sites/default/files/pdfs/ie2002.pdf.

[7] See AGA Comments on Proposed Rule: 2015 Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule, 81 Fed. Reg. 2536 (January 15, 2016), EPA-HQ-OAR-2015-0526-0071, at 2-3.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 26

Comment Excerpt: SIA understands EPA's desire to collect data on an additional category of greenhouse gas emissions (fuel burning equipment with heat inputs equal to or greater than 10

MMBtu/hr and less than 100 MMBtu/hr). This change would include an increase in individual reporting scope of various pieces of fuel-burning equipment from SIA member companies (for example, smaller facility-level boilers). Some of these fuel-burning equipment do not have individual natural gas meters to measure the individual unit's fuel use. These fuel-burning equipment are just a small subset of the semiconductor industry's overall reported GHG emissions, which are a very small subset of the entire U.S. GHG emissions. Estimates show semiconductor equipment between 10 MMBtu/hr to 100 MMBtu/hr represent less than 0.005% of overall U.S. GHG emissions.

Tracking individual combustion units between 10 and 100 MMBtu/hr within the semiconductor industry would provide little value for the overall U.S. GHG emissions and would require an undue burden and cost to install individual unit natural gas meters. SIA requests an exemption from these requirements for Subpart I reporters.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Johnathan DeAth
Commenter Affiliation: National Lime Association (NLA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0197-A1
Comment Excerpt Number: 3

Comment Excerpt: In 40 CFR Part 98.36(c)(1)(ii), EPA proposes that "when reporting using aggregation of units, report an estimate of the total annual heat input (expressed as a decimal fraction) for each unit in the group greater than or equal to 10 mmBtu/hr." This proposed approach cannot be relied upon to provide accurate estimates of heat input, and will also be overly burdensome for the lime industry to calculate and report. The physical configuration of some lime plants precludes accurate, unit-specific estimations of heat input. Certified, calibrated meters are not installed on a kiln-by-kiln basis at all lime plants. It is common in the lime industry for solid fuel usage from on-site stockpiles (*e.g.* coal and petroleum coke) to be quantified by various technical survey methods and is not sub-divided for each combustion unit. Since CO_2 emissions disperse to the entire global atmosphere, requesting unit-specific heat input estimates is not necessary, and may not be technically feasible. Facility-wide reporting of combustion emissions satisfies EPA's objective of developing facility-wide emissions information and additional unit information is superfluous and of limited value. EPA should not require collecting estimates of the total annual heat input for units greater that 10 mmBTU/hr for the lime industry.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Leslie Ritts
Commenter Affiliation: National Environmental Development Associations Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0213-A1
Comment Excerpt Number: 2

Comment Excerpt: NEDA/CAP believes that the proposed additional reporting of GHG by aggregation of combustion units and piping is both unreasonable and unrelated to filling an important data gap in the existing GHGRP. Facilities that are affected under Subpart C of Part 98 already report total GHGs from combustion units, with significant detail, into e-GGRT. The EPA nowhere asserts that that information is compromised in any way and/or that it does not meet the letter of the legal requirements in the Clean Air Act. Neither does the agency outline how additional unit-based information will add value, other than its assertion that it will "better inform future policy and programs," by filling "a data gap in unit information." The agency has not sufficiently explained what that "data gap" is, how the absence of such data compromises information that it is receiving, and how the collection of the additional information will resolve issues with the current data that it is receiving. Although EPA "wants" more detailed information, it is entirely arbitrary and an abuse of the agency's authority to require such information without enunciating what gaps such information would fill in the existing collection of data and how that information would be used. Regulation for "regulation's sake," has been decried by the agency, itself, and by those regulated by it. For these reasons, NEDA/CAP opposes adding 40 CFR 98.36(c)(1)(ii) and (c)(3)(ii) to Subpart C. Moreover, NEDA/CAP cannot fathom how this additional information will provide the agency with helpful regulatory information, in view of how emissions from combustion units are now calculated and reported. Disaggregating total emissions from combustion equipment and aggregating it by combustion unit equipment (minus units "rated" less than 10 mm Btu/hr), using estimation techniques,[1] does not appear to provide useful information about an affected facility's GHG emissions, and it is quite possible that it could confuse the public and the agency about what is currently being reported and compromise a source's (and the country's) goals to halve emissions by 2030-2035.

Footnotes

[1] In fact, EPA appears to nod to the added cost of reporting this information by allowing affected facilities to utilize "estimated" values of heat input for groups and individual sources to be used, which serves only to undermine the agency's statements regarding deflecting the cost and difficulty of calculating this information. Although NEDA/CAP would support the ability to use estimation techniques if the agency were to finalize these "aggregation" reporting requirements, we still challenge why this information would be helpful to EPA and/or the public, particularly in view of its utility.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 43

Comment Excerpt: In Subpart C, for reporters aggregating units, EPA is proposing that for each unit in the group, an estimate of the total annual heat input (expressed as a decimal fraction) must be reported, and this estimate should be based on the actual heat input of the unit compared to the actual heat input of all units in the group.

EPA claims this is "not expected to significantly increase burden for reporters" but if the fraction must be based on actual heat inputs, then this requirement significantly increases burden and essentially negates the time efficiencies gained by reporting the aggregated group, especially for reporters who use the common pipe method of aggregation. By proposing that actual heat inputs must be used, EPA would essentially require that heat inputs be calculated for each piece of equipment each year, which would eliminate the benefits of reporting an aggregate group where heat input is calculated only once for whole group of equipment. This data element should be eliminated, since the maximum rated heat input capacity of each unit in the aggregated group should provide enough information for EPA to reasonably approximate emissions per individual pieces of equipment for bulk analysis purposes. At the very least, EPA should not mandate that this be based on actual heat input per equipment. If EPA does not make either change, then EPA must reflect the significant increase in burden in the Assessment of Burden Impact for Proposed Revisions for the Greenhouse Gas Reporting Rule. This would be approximated by multiplying the effort expended by reporters using an aggregation method by the number of pieces of equipment in the aggregated group. For GPA members using the common pipe method, for example, a ten-fold increase in burden (or more) would be a reasonable assumption of burden increase, especially since EPA further specifies that, "Estimates of the actual heat inputs may be based on company records." This could be interpreted to mean that all available data must be used to develop the actual heat inputs, which further emphasizes the burden of this new requirement.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Leslie Ritts
Commenter Affiliation: National Environmental Development Associations Clean Air Project (NEDA/CAP)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0213-A1
Comment Excerpt Number: 3

Comment Excerpt: While EPA may desire the information for ambiguously identified, future policy or rulemaking, the impact of the proposed rule would be current and concrete for regulated entities, amounting to busy-work with potentially very limited value and detracting from greenhouse gas emissions and climate risk and opportunity information that regulated entities produce for the EPA and may need to produce under other proposed federal rules.[2] In the instant NPRM, however, the agency appears to justify the proposed addition of the reporting requirements for aggregated units, because it— expects that the other requirements (*i.e.*, unit type and estimate of the fraction of annual heat input) can be determined from existing company records. The total fraction of annual heat input for each unit in the group will be determined by dividing the estimated actual heat input for that unit by the sum of the estimated actual heat input for all units in the group. Id. at 36,940. Accordingly, the Notice asserts that any new burden incurred from this proposed requirement is expected to be minimal and associated with calculating the fraction of the total annual heat input and entering data into the e-GGRT software." NEDA/CAP believes the agency's assumptions are in error. First, energy records maintained by facility do not necessarily correspond to the heat input of a unit, because that is dependent on a number of factors, including age of the unit, how it utilized in processes for steam, cooling, or other purposes, and the high heating value of fuel during particular operating periods. This would particularly be the case in industries that use batching with different pieces of process equipment for different products. In addition, the estimating techniques described in the Notice, perhaps included to "minimize" the cost and difficulty of deriving information that EPA proposes to require be reported are likely to undermine the data that is reported and/or possibly compromise the integrity of actual values currently calculated and reported. We understand the urgency that the agency appears to place on demonstrating that the additional costs of the proposed additional aggregation reporting is "minimal" but in the agency's attempt to minimize the cost of deriving the information through estimation techniques not only undermines the proposed GHGRR revisions, but it also underscores its arbitrariness.

Footnotes

[2] See Securities and Exchange Commission Release Nos. 33-11042; 34-94478 at https://www.sec.gov/rules/proposed/2022/33-11042.pdf.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 10

Comment Excerpt: Williams is also concerned with EPA's reliance on proposed actual (metered) heat input requirements for individual combustion units. Proposed revisions to Subpart C to rely on actual (metered) heat input requirements for individual combustion units is not always feasible since individual fuel meters are not common and annual heat input for individual

units is often estimated based on maximum high heat input rating and run hours. Thus, EPA's conclusion that "any new burden incurred from this proposed requirement is expected to be minimal" is misguided or incorrect. Estimated heat input requirements based on maximum high heat input rating and run hours should be accepted for individual units to determine fraction of total actual annual heat input.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 15

Comment Excerpt: PBPA is opposed to the aggregation of units in 40 CFR 98.36(c)(1) and (3) and we recommend keeping the reporting structure as is currently required. The proposed revisions would significantly increase the recordkeeping and reporting burden while the value to EPA is unclear. If EPA chooses to move forward with its proposed revisions here, we request in-depth clarification on the value to the public and EPA as to these changes.

Response: See section III.C.2 of the preamble to the final rule for the EPA's response to this comment.

5.4 Revisions to add reporting requirements for combustion units that are part of an electrical generation unit

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Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 9

Comment Excerpt: One of the Association's member companies has an EGU that sells electricity to the power grid. This facility reports these emissions under Subpart D – Electricity Generation. It is unclear from the proposal how reporting these emissions under Subpart C would not be duplicative and confusing for regulated entities. Therefore, the Association recommends that the Agency provide clarity in the final rule that Subpart C is only applicable in situations where a general stationary fuel combustion unit is used to both generate electricity and for other purposes.

Response: The EPA is not taking final action in this rule on the proposed addition of a new indicator that would identify units as electricity generating units. Furthermore, the EPA is not

taking final action in this rule on the additional proposed requirement for reporting an estimate of a group's total reported emissions attributable to electricity generation. See section III.C.2 of the preamble to the final rule for further discussion.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 3

Comment Excerpt: An EGU is not specifically defined within Subpart A or Subpart C; the definition of an "electricity generation source category" EGU found in Subpart D in 98.40 includes only EGUs that are subject to monitoring and reporting requirements found in 40 CFR Part 75. While EGUs are not defined in Subpart A explicitly, a footnote to Table A–7, "Data Elements that Are Inputs to Emission Equations and for Which the Reporting Deadline is March 31, 2015" states that for sources reporting under Subpart C (cited below with emphasis added). The Industry Trades are seeking clarification on the definition of an EGU for this reporting element; as proposed, it is unclear what units would meet this reporting requirement. The Industry Trades support a definition that aligns with the footnote presented under Table A–7:

Required to be reported only by: (1) Stationary fuel combustion sources (*e.g.*, individual units, aggregations of units, common pipes, or common stacks) subject to subpart C of this part that contain at least one combustion unit **connected to a fuel-fired electric generator owned or operated by an entity that is subject to regulation of customer billing rates by the PUC (excluding generators connected to combustion units subject to 40 CFR part 98, subpart D) and that are located at a facility for which the sum of the nameplate capacities for all such electric generators is greater than or equal to 1 megawatt electric output**; and (2) stationary fuel combustion sources (*e.g.*, individual units, aggregations of units, common pipes, or common stacks) subject to subpart C of this part that do not meet the criteria in (1) of this footnote that elect to report these data elements, as provided in § 98.36(a), for reporting year 2014.

Additionally, the Industry Trades propose that the definition of an EGU specifically exclude drivers used to power equipment including but not limited to compressors and pumps.

Response: The EPA is not taking final action in this rule on the proposed addition of a new indicator that would identify units as electricity generating units. Furthermore, the EPA is not taking final action in this rule on the additional proposed requirement for reporting an estimate of a group's total reported emissions attributable to electricity generation. See section III.C.2 of the preamble to the final rule for further discussion.

Commenter Name: Paul Balserak
Commenter Affiliation: American Iron and Steel Institute (AISI)

Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0316-A1
Comment Excerpt Number: 7

Comment Excerpt: EPA should not require facilities reporting under Subpart C to identify a unit as an EGU. The proposed action would result in additional burdens and confusion because of conflicting definitions in and applicability of other EPA regulatory programs which traditionally have regulated EGUs separately from non-EGUs combustion sources such as those in the Iron and Steel sector. The regulation under 40 CFR 98.36(d) already has requirements for EGUs, as commonly defined, which are found in Subpart D –Electricity Generation. The units generating steam and electricity at Iron and Steel facilities do not meet the definition of an EGU under Subpart D, nor under any other EPA regulation. In addition, 40 CFR 98.36(f) requires sources to identify if they are tied to an entity regulated by any public utility commission. The units generating steam and electricity at Iron and Steel facilities are not EGUs under the Acid Rain Program nor do they meet the definitions of EGU under the New Source Performance Standards or National Emission Standards for Hazardous Air Pollutants. It is arbitrary for EPA to suddenly depart from these existing regulatory definitions and programs. Expanding the definition of EGU to include any combustion unit tied to electricity generation will lead to practical and regulatory confusion and is not needed for the purposes of GHG reporting.

Response: The EPA is not taking final action in this rule on the proposed addition of a new indicator that would identify units as electricity generating units. Furthermore, the EPA is not taking final action in this rule on the additional proposed requirement for reporting an estimate of a group's total reported emissions attributable to electricity generation. See section III.C.2 of the preamble to the final rule for further discussion.

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 11

Comment Excerpt: The Association also seeks clarification that EPA does not intend to require facilities that use waste heat for generating electricity to report this under Subpart C or any other subpart of Part 98. Waste heat recovery recycles the heat created from other operational processes to generate electricity. The emissions from this scenario would have been reported through the original process that generated the waste heat. Requiring facilities to report the emissions from the generation of electricity using waste heat recovery would be double counting.

Response: The EPA is not taking final action in this rule on the proposed addition of a new indicator that would identify units as electricity generating units. Furthermore, the EPA is not taking final action in this rule on the additional proposed requirement for reporting an estimate of

a group's total reported emissions attributable to electricity generation. See section III.C.2 of the preamble to the final rule for further discussion.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 11

Comment Excerpt: For combustion emissions, the Supplemental Notice amends Subpart C to add an estimate of combustion emissions from facility electricity generation. EPA should clearly indicate that emergency generators are exempt from this requirement. Subpart C currently exempts emergency generators, and EPA should retain that exemption and clearly indicate that electricity from emergency generator use is not subject to this new reporting requirement.

When estimating emissions from electricity generation, the Associations support the proposed approach[24] that allows operators to use an engineering estimate of the percentage of combustion emissions attributable to facility electricity generation. The proposed amendments retain the ability to use aggregate, common stack, or common pipe methods for reporting combustion emissions, and one of those methods is typically used for Subpart C combustion emission estimates at affected natural gas transmission compressor stations and storage facilities. There will typically be little or no electricity generation at these facilities, but some include auxiliary power generators. An engineering estimate is adequate for reporting the share of emissions from electricity generation, and more complex or rigorous methods are not warranted.

Footnotes

[24] See § 98.36(c)(1)(xii), (c)(2)(xii) and (c)(3)(xii) at 88 FR 32,926.

Response: The EPA is not taking final action in this rule on the proposed addition of a new indicator that would identify units as electricity generating units. Furthermore, the EPA is not taking final action in this rule on the additional proposed requirement for reporting an estimate of a group's total reported emissions attributable to electricity generation. See section III.C.2 of the preamble to the final rule for further discussion.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0321-A1
Comment Excerpt Number: 6

Comment Excerpt: Regarding Subpart C: EPA should clearly indicate that emergency generators are not subject to the new requirement, and an engineering estimate of the percentage of combustion emissions is an adequate approach.

For combustion emissions, the Supplemental Notice amends Subpart C to add an estimate of combustion emissions from facility electricity generation. EPA should clearly indicate that emergency generators are exempt from this requirement. Subpart C currently exempts emergency generators, and EPA should retain that exemption and clearly indicate that electricity from emergency generator use is not subject to this new reporting requirement.

When estimating emissions from electricity generation, INGAA supports the proposed approach[5] that allows operators to use an engineering estimate of the percentage of combustion emissions attributable to facility electricity generation. The proposed amendments retain the ability to use aggregate, common stack, or common pipe methods for reporting combustion emissions, and one of those methods is typically used for Subpart C combustion emission estimates at affected transmission compressor stations and storage facilities. There will typically be little or no electricity generation at these facilities, but some include auxiliary power generators. An engineering estimate is adequate for reporting the share of emissions from electricity generation, and more complex or rigorous methods are not warranted.

Footnotes

[5] See § 98.36(c)(1)(xii), (c)(2)(xii) and (c)(3)(xii) at 88 FR 32,926.

Response: The EPA is not taking final action in this rule on the proposed addition of a new indicator that would identify units as electricity generating units. Furthermore, the EPA is not taking final action in this rule on the additional proposed requirement for reporting an estimate of a group's total reported emissions attributable to electricity generation. See section III.C.2 of the preamble to the final rule for further discussion.

Commenter Name: Paul Balserak
Commenter Affiliation: American Iron and Steel Institute (AISI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0316-A1
Comment Excerpt Number: 9

Comment Excerpt: EPA also proposes to require that, for multi-unit configurations, the reporter identify what fraction of the emissions from the unit is attributable to EGUs. EPA does not describe how a reporter would identify such fraction, nor does EPA take into account that emissions from a single combustion unit might provide steam to multiple consumers for multiple purposes, only a portion of which includes on-site behind-the-meter electricity generation. EPA claims this reporting would result in minimal burden because the reporter "…knows if the unit is an EGU and, if so, the estimated fraction of total emissions attributable to the EGU can be determined by engineering estimates." In making this statement, EPA oversimplifies the method to determine subsets of information and walks down a path that leads to overly complicated,

unnecessary, and burdensome new compliance requirements without commensurate benefits. If the rule is finalized as proposed, methods to determine electricity-related emissions by fraction could become subject to numerous other requirements, such as different calculations for GHG emissions, monitoring and QA/QC requirements, data reporting, and record retention obligations. EPA should not require the reporting of fractions of GHG emissions from combustion units and allocate them to electricity generation activities associated with that unit under Subpart C. Rather, EPA should maintain consistency with their multitude of other statutes and regulations when defining EGUs and should continue to regulate those separately under Subpart D of the GHGRP.

Response: The EPA is not taking final action in this rule on the proposed addition of a new indicator that would identify units as electricity generating units. Furthermore, the EPA is not taking final action in this rule on the additional proposed requirement for reporting an estimate of a group's total reported emissions attributable to electricity generation. See section III.C.2 of the preamble to the final rule for further discussion.

5.5 Revisions to EFs and calculation methodology for natural gas-fired compressor drivers located at subpart W facilities

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 2

Comment Excerpt: We would encourage EPA to proceed with the revision to emission factors for natural gas fired compressor engines, with the request that these combustion sources remain in (or be moved to) subpart C in accordance with our more detailed comments (see section IV.L Combustion Equipment).When calculating combustion methane emissions, we strongly support the ability to use original equipment manufacturer specific factors, stack test data, a control percentage applied to the emissions, or other empirical data to allow reporters to accurately reflect combustion methane emissions and, importantly, emission reductions.

Response: As noted in section III.C of the preamble to the final rule, the EPA is not taking final action in this final rule on proposed revisions to subpart C correlated with proposed amendments to subpart W (Petroleum and Natural Gas Systems). As noted in sections I.C and III.C of the preamble to the final rule, the EPA has issued a subsequent proposed rule for subpart W on August 1, 2023 (88 FR 50282) and has reproposed related amendments to subpart C in that separate action.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 3

Comment Excerpt: Subpart C Common Pipe and Aggregation Methodologies Should Be Retained. Subpart C allows emission calculations for natural gas-fired combustion units to be completed using Tier 1 or Tier 2 common pipe or aggregation methods. Implementation of updated emission factors dependent on unit type should not compromise access to those calculation methods for natural gas-fired units, and Subpart C should clearly indicate that operators can use available data to identify the fraction of fuel assigned to different unit types (with different combustion exhaust methane EFs). Compressor stations often include different types and sizes of compressor drivers, such as one or more two-stroke lean-burn engines, four-stroke lean-burn engines, and turbines at the same facility. Operators should be allowed to use available records (*e.g.*, unit size, heat rate, annual run time) to estimate annual fuel usage and assign the appropriate exhaust methane EF from Table W–9 (for engines) or Table C–2 (for turbines, boilers, etc.) for aggregated or common pipe estimates.

Response: As noted in section III.C of the preamble to the final rule, the EPA is not taking final action in this final rule on proposed revisions to subpart C correlated with proposed amendments to subpart W (Petroleum and Natural Gas Systems). As noted in sections I.C and III.C of the preamble to the final rule, the EPA has issued a subsequent proposed rule for subpart W on August 1, 2023 (88 FR 50282) and has reproposed related amendments to subpart C in that separate action.

Commenter Name: Greg Southworth and Erik Milito
Commenter Affiliation: Offshore Operators Committee (OOC) and National Ocean Industries Association (NOIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0201-A1
Comment Excerpt Number: 2

Comment Excerpt: OOC and NOIA recommend that the proposed regulatory language be modified to read as follows:

(c)(1) Aggregation of units. If a facility contains two or more units (*e.g.*, boilers or combustion turbines), each of which has a maximum rated heat input capacity of 250 mmBtu/hr or less, you may report the combined GHG emissions for the group of units in lieu of reporting GHG emissions from the individual units, provided that the use of Tier 4 is not required or elected for any of the units and the units use the same tier for any common fuels combusted. Compressor drivers that calculate emissions using an applicable CH_4 emission factor from Table W–9 to subpart W of this part, must be reported as their own aggregation of units configuration, according to design class (*i.e.*, two-stroke lean-burn, four-stroke lean-burn, and four-stroke rich-burn). You may not have a combination of one design class of compressor driver (using one Table W–9 CH_4 emission factor, or site-specific emission factors) and other combustion units (*e.g.*, using a Table C–2 CH_4 emission factor or another Table W–9 CH_4 emission factor, or site-

specific emissions factors) in the same aggregation of units configuration. If this option is selected, the following information shall be reported instead of the information in paragraph (b) of this section:

(c)(3) Compressor drivers that calculate emissions using an applicable CH_4 emission factor from Table W–9 to subpart W of this part, must be reported as their own common pipe configuration, according to design class (*i.e.*, two-stroke lean-burn, four-stroke lean-burn, and four-stroke rich-burn). You may not have a combination of one design class of compressor driver (using one Table W–9 CH_4 emission factor, or site-specific emission factors) and other combustion units (*e.g.*, using a Table C–2 CH_4 emission factor or another Table W–9 CH_4 emission factor, or site-specific emission factors) in the same common pipe configuration. When the common pipe reporting option is selected, the following information shall be reported instead of the information in paragraph (b) of this section:

Rationale: Site-specific emission factors may be available for certain equipment from the equipment manufacturer or from equipment testing. If those factors are available, the regulated community should have the option of using those emission factors.

Response: As noted in section III.C of the preamble to the final rule, the EPA is not taking final action in this final rule on proposed revisions to subpart C correlated with proposed amendments to subpart W (Petroleum and Natural Gas Systems). As noted in sections I.C and III.C of the preamble to the final rule, the EPA has issued a subsequent proposed rule for subpart W on August 1, 2023 (88 FR 50282) and has reproposed related amendments to subpart C in that separate action.

Commenter Name: Greg Southworth and Erik Milito
Commenter Affiliation: Offshore Operators Committee (OOC) and National Ocean Industries Association (NOIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0201-A1
Comment Excerpt Number: 1

Comment Excerpt: The proposed text appears in 6 paragraphs in the proposed rule.

OOC and NOIA recommend that the proposed text be modified as follows:

EF = Fuel-specific default emission factor for CH_4 or N_2O, from Table C–2 of this subpart (kg CH_4 or N_2O per mmBtu), except for natural gas compressor drivers at facilities subject to subpart W of this part, which must use the applicable CH_4 emission factor from Table W–9 to subpart of this part, Table C–2, or site-specific emission factors.

Rationale: Table W–9 contains default emission factors for Natural Gas-Fired Compressor Drivers only. Table W–9 does not contain emission factors for natural gas-driven turbines (ex. compressor drivers). Natural gas turbines are common equipment in offshore oil and natural gas production operations. The regulated community needs appropriate emission factors for natural

gas turbines to successfully report GHG emissions from these sources. In addition, site-specific emission factors may be available for certain equipment from the equipment manufacturer or from equipment testing. If those factors are available, the regulated community should have the option of using those emission factors.

Response: As noted in section III.C of the preamble to the final rule, the EPA is not taking final action in this final rule on proposed revisions to subpart C correlated with proposed amendments to subpart W (Petroleum and Natural Gas Systems). As noted in sections I.C and III.C of the preamble to the final rule, the EPA has issued a subsequent proposed rule for subpart W on August 1, 2023 (88 FR 50282) and has reproposed related amendments to subpart C in that separate action.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 39

Comment Excerpt: To improve clarity for reporters, API recommends that EPA revise the definition of variable "EF" in Equation C–8 to state that emission factors from Table W–9 of Subpart W are only required for 2-stroke lean-burn, 4-stroke lean burn, or 4-stroke rich burn compressor drivers, not all compressor drivers subject to reporting under subpart W. We recommend revising the definition of "EF" to read "Fuel-specific default emission factor for CH_4 or N_2O from Table C–2 of this subpart (kg CH_4 or N_2O per MMbtu), except for 2-stroke lean burn, 4-strake lean burn, or 4- stroke rich burn natural gas compressor drivers at facilities subject to subpart W of this part, which must use the applicable CH_4 emission factor from Table W-9 to subpart W of this part." EPA should apply the same revision for the definition of variable "EF" in Equations C–8a, C–8b, C–9a, C–9b, and C–10, for clarity and consistency.

Additionally, in regard to Equation C–8 (and C–8a and C–8b), API requests that EPA clarify if the same conditions for variable "EF" apply to offshore compressor drivers.

Response: As noted in section III.C of the preamble to the final rule, the EPA is not taking final action in this final rule on proposed revisions to subpart C correlated with proposed amendments to subpart W (Petroleum and Natural Gas Systems). As noted in sections I.C and III.C of the preamble to the final rule, the EPA has issued a subsequent proposed rule for subpart W on August 1, 2023 (88 FR 50282) and has reproposed related amendments to subpart C in that separate action.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association

Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 42

Comment Excerpt: EPA is proposing new methane emission factors for two-stroke lean-burn, four stroke lean-burn, and four-stroke rich-burn reciprocating engines. However, throughout the preamble and proposed rule text, EPA uses the inaccurate and broad terminology of "compressor drivers" to refer to these engines. In addition to engines, midstream operators commonly use turbines as compressor drivers. EPA is not proposing new methane emission factors for turbines. Therefore, EPA must replace the term "compressor drivers" with "compressor driver-engines" (or something similar) throughout the preamble and rule text, including in both Subparts C and W, to clarify that turbines are not included.

Response: As noted in section III.C of the preamble to the final rule, the EPA is not taking final action in this final rule on proposed revisions to subpart C correlated with proposed amendments to subpart W (Petroleum and Natural Gas Systems). As noted in sections I.C and III.C of the preamble to the final rule, the EPA has issued a subsequent proposed rule for subpart W on August 1, 2023 (88 FR 50282) and has reproposed related amendments to subpart C in that separate action.

5.6 Revisions to update cylinder gas audit calibration spans

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 2

Comment Excerpt: We do not support amending 40 CFR 98.34(c)(6) to allow cylinder gas audits to be performed using calibration gas concentrations of 40-60% and 80-100% of CO_2 span, whenever the required CO_2 span value for a flue gas is not appropriate for the prescribed audit ranges. Natural gas turbines have about 5% CO_2 in flue gas, the required calibration concentrations under Appendix F of 40 CFR 60 were not appropriate because they may be above the CO_2 span value.

Response: As noted in the preamble, the EPA has received questions through the GHGRP Help Desk since 2010 indicating that industrial flue gases also occur where the measured CO_2 concentration is very low (*e.g.*, natural gas turbines typically have about 5 percent CO_2 in flue gas), as also noted by the commenter. In such cases, the current required calibration gas concentrations (*i.e.*, 5–8 percent and 10–14 percent CO_2 by volume) outlined under appendix F of 40 CFR part 60 prove unsuitable, as they may be above the CO_2 span value and so would not provide information regarding accuracy of the monitor at actual representative stack gas concentrations. Accordingly, the EPA is finalizing 40 CFR 98.34(c)(6) to allow cylinder gas audits to be performed using calibration gas concentrations of 40–60 percent and 80–100 percent of CO_2 span, whenever the required CO_2 span value for a flue gas does is not appropriate for the

prescribed audit ranges in appendix F of 40 CFR part 60. This will allow cylinder gas audits to check the response of the CO_2 analyzer at two calibration gas concentrations, representing separate portions of the measurement scale, when the CO_2 span is significantly lower or higher than 20 percent CO_2.

5.7 Comments on other revisions and clarifications to subpart C

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 5

Comment Excerpt: We support the following proposals:

Amending Subpart C rules in 40 CFR § 98.36 to eliminate redundancies in reporting related to total annual CO_2 mass emissions from the combustion of all fossil fuels combined.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 41
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: API requests that EPA clarify if the "annual average" element required to be reported for the Tier 2 Calculation Methodology for verification under § 98.36(e)(2)(ii)(C) should be an arithmetic or weighted annual average.

Response: The "annual average" element required to be reported for the Tier 2 Calculation Methodology for verification under § 98.36(e)(2)(ii)(C) should be a weighted annual average, as noted in 98.33(a)(2)(ii). Within subpart C, it is important to note that the term "annual average" consistently pertains to a weighted approach, while the term "arithmetic average" refers to a simple average without any weighting.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 10

Comment Excerpt: EPA Should Eliminate Double Reporting of the Same Data in Different Subparts - As Subpart C is a reporting category covering a broad range of stationary fuel combustion sources, we are concerned about the potential for overlap between the reporting required under this subpart with reporting required under other sector-specific parts of the program. Due to the possibility of redundant reporting requirements, EPA should clarify that any source that reports in a specific subpart is not again required to report emissions from the same source in a second subpart. This would provide more clarity for affected entities and would reduce duplicate reporting of the same data.

Response: The EPA has previously addressed comments related to double-counting in the 2009 final rule (74 FR 56260, October 10, 2009) and the responses to comments related to Subpart C (see Volume 15 of USEPA Response to Public Comments on the Mandatory Greenhouse Gas Reporting Rule: Subpart C-General Stationary Fuel Combustion Sources, Docket Id. No. EPA-HQ-OAR-2008-0508). Per the requirements in 40 CFR part 98, subpart A (General Provisions), facilities have to report GHG emissions from all source categories located at their facility, including stationary combustion and process emissions. EPA does not intend that emissions be double reported, and part 98 provides specific methods for reporting sector-specific process emissions versus combustion emissions. This comment is out of scope for this rulemaking, but the EPA may consider further clarifications in a future rulemaking.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 4

Comment Excerpt: We also recommend that the agency require owners and operators of stationary combustion sources to report the year of each unit's installation. This information should be readily available and easily reported. In addition, the age of existing units could shape EPA's analysis of the effects of its NSPS, depending on the projected timing of replacement of existing sources, as well its emission guidelines, which may apply differently to sources with shorter remaining useful lives, see 42 U.S.C. § 7411(d)(1). Units' vintages, when correlated to emissions rates, may also reveal any degradation in emissions performance over time. It will also provide states and other stakeholders with vital information to consider the age of these units and potential turnover time to inform climate policymaking. Because this information could be relevant in regulating a source category under section 111, and because it is reasonable to require it, it is within EPA's authority to seek it under section 114.

We recommend that the agency require reporting of the typical operating-temperature range and output type of the combustion unit (*i.e.*, water, steam, or other). This information could prove

critical in selecting the appropriate system of emission reduction for a single or several categories of combustion sources under section 111. For example, electric heat pumps present a viable alternative to boilers supplying heat below 150°C, which together account for more than 60% of the heat provided by boilers.[8] About 30% of process heat falls below the 150°C threshold, while process heat needed to reach higher temperatures can be supplied by solar thermal and nuclear generation.[9] Unit output type and typical operating-temperature range would not be difficult to obtain and report. Because this information is highly relevant to fulfilling statutory purposes and is straightforward to obtain and report, it would be both reasonable and important for EPA to require it under CAA section 114.[10]

Footnotes

[8] See Peter Alstone et al., Schatz Energy Research Center, Toward Carbon-Free Hot Water and Industrial Heat with Efficient and Flexible Heat Pumps, at 58-59 & Fig. 24 (Aug. 2021), http://schatzcenter.org/pubs/2021-heatpumps-R1.pdf.

[9] See U.S. Dep't of Energy, Industrial Decarbonization Roadmap, at 15-16 (Sept. 2022), https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap.pdf.

[10] As with any other information required under the GHGRP, EPA could determine whether the temperature of boiler output and the boiler output type qualify as confidential business information.

Response: See response to comment EPA-HQ-OAR-2019-0424-0248-A1, Excerpt 4.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 4

Comment Excerpt: We also recommend that the agency require owners and operators of stationary combustion sources to report the year of each unit's installation. This information should be readily available and easily reported. In addition, the age of existing units could shape EPA's analysis of the effects of its NSPS, depending on the projected timing of replacement of existing sources, as well its emission guidelines, which may apply differently to sources with shorter remaining useful lives.[23] Units' vintages, when correlated to emissions rates, may also reveal any degradation in emissions performance overtime. It will also provide states and other stakeholders with vital information to consider the age of these units and potential turnover time to inform climate policymaking. Because this information could be relevant in regulating a source category under section 111, and because it is reasonable to require it, it is within EPA's authority to seek it under section 114. We recommend that EPA require reporting of the typical operating-temperature range and output type of the combustion unit (*i.e.*, water, steam, or other). This information could prove critical in selecting the appropriate system of emission reduction for a single or several categories of combustion sources under section 111. For example, electric heat pumps present a viable alternative to boilers supplying heat below 150°C, which together account for more than 60% of the heat provided by boilers.[24] About 30% of process heat falls

below the 150°C threshold, while process heat needed to reach higher temperatures can be supplied by solar thermal and nuclear generation.[25] Unit output type and typical operating-temperature range would not be difficult to obtain and report. Because this information is highly relevant to fulfilling statutory purposes and is straightforward to obtain and report, it would be both reasonable and important for EPA to require it under section 114.[26]

Footnotes

[23] See 42 U.S.C. § 7411(d)(1).

[24] See Peter Alstone et al., Schatz Energy Research Center, Toward Carbon-Free Hot Water and Industrial Heat with Efficient and Flexible Heat Pumps, at 58-59 & Fig. 24 (Aug. 2021), http://schatzcenter.org/pubs/202 1-heatpumps-RL pdf.

[25] See U.S. Dep't of Energy, Industrial Decarbonization Roadmap, at 15-16 (Sept. 2022), https://www.energy.gov/sites/default/files/2022-09/Industrial %20Decarbonization%20Roadmap.pdf.

[26] As with any other information required under the GHGRP, EPA could determine whether the temperature of boiler output and the boiler output type qualify as confidential business information.

Response: This comment is out of scope for this rulemaking. We did not propose or request comment on the reporting requirements raised by commenters, specifically the year of unit installation, the typical operating-temperature range, and the output type of the combustion unit, and are not taking final action in this rule on those requested revisions. The EPA may consider these changes in a future rulemaking.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 5

Comment Excerpt: In a future rulemaking, EPA should consider expanding the requirements of subpart C to include reporting of data that would be needed to calculate the CO_2 concentration of each flue gas stream leaving one or more stationary combustion units. Units or groups of units using CEMS already measure hourly CO_2 concentrations,[27] so the additional requirement for these units would simply mean reporting that data to EPA. For individual units or groups of units sharing a stack without CEMS, the added requirements could involve data on fuel types and quantities of fuel combusted, as well as operating conditions (*e.g.*, the temperature, pressure, and volume rate of flow of the exiting gas), over a meaningful timeframe such as an hour or a day. Alternatively, the agency could require operators to calculate CO_2 concentrations themselves and report the results. However operators choose to comply, information on CO_2 concentrations in flue gas streams will be key to evaluating decarbonization strategies for stationary combustion units and other types of sources across many industrial subsectors. It would therefore be reasonable for EPA to require reporting of this data—both for combustion emissions from the

sources in subpart C, and potentially for process emissions from other GHGRP source categories as well.

Footnotes

[27] 40 CFR § 98.33(a)(4)(ii); id. at § 98.36(c)(2).

Response: The EPA did not propose or request comment on requirements to include reporting of the CO_2 concentration of flue gas streams or related requirements and is not taking final action at this time on such requested requirements. Therefore, this comment is out of scope for this rulemaking. The EPA may consider these changes in a future rulemaking.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 5

Comment Excerpt: In a future rulemaking, EPA should consider expanding the requirements of subpart C to include reporting of data that would be needed to calculate the CO_2 concentration of each flue gas stream leaving one or more stationary combustion units. Units or groups of units using CEMS already measure hourly CO_2 concentrations, 40 C.F.R. § 98.33(a)(4)(ii), id. § 98.36(c)(2), so the additional requirement for these units would simply mean reporting that data to EPA. For individual units or groups of units sharing a stack without CEMS, the added requirements could involve data on fuel types and quantities of fuel combusted, as well as operating conditions (*e.g.*, the temperature, pressure, and volume rate of flow of the exiting gas), over a meaningful timeframe such as an hour or a day. Alternatively, the agency could require operators to calculate CO_2 concentrations themselves and report the results. However operators choose to comply, information on CO_2 concentrations in flue gas streams will be key to evaluating decarbonization strategies for stationary combustion units and other types of sources across many industrial subsectors. It would therefore be reasonable for EPA to require reporting of this data—both for combustion emissions from the sources in subpart C, and potentially for process emissions from other GHGRP source categories as well.

Response: The EPA did not propose or request comment on requirements to include reporting of the CO_2 concentration of flue gas streams or related requirements and is not taking final action at this time on such requested requirements. Therefore, this comment is out of scope for this rulemaking. The EPA may consider these changes in a future rulemaking.

5.8 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart C

Commenter Name: Johnathan DeAth
Commenter Affiliation: National Lime Association (NLA)
Commenter Type: Industry Trade Association

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0197-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA is proposing to require that unit-specific data be reported for units whose data is currently aggregated and reported. This topic is discussed in Section VI of the rule preamble and under revisions to Subpart C of the proposed rule. NLA has significant concerns about the anti-competitive nature of these changes, which could impact lime producers severely.

Currently, in e-GGRT, the general unit type, the highest maximum rated heat input capacity, and the cumulative maximum rated heat input capacity are reported for groups of aggregated units. The proposed rule requires the reporting of unit type and maximum rated heat input capacity for each unit in a group (greater than or equal to 10 mmBtu/hr). The proposed rule also requires the total annual heat input (expressed as a decimal fraction) for each unit in the group (greater than or equal to 10 mmBtu/hr). These requirements in the proposed rule also apply to units grouped under the common pipe configuration.

Section VI of the rule preamble notes that 25 data elements that are proposed to be reported under subparts C...are proposed to be assigned to the "Facility and Unit Identifier Information" emission data category. Correspondingly, Table 1 in the March 2022 EPA memo titled Proposed Confidentiality Determinations and Emission Data Designations for Data Elements in Proposed Revisions to the Greenhouse Gas Reporting Rule (Docket Id. No. EPA-HQ-OAR2019-0424) notes that these proposed Subpart C data elements would NOT be afforded CBI designation but would be considered "facility and unit identifier information," along with the categorical designation of "emission data."

For companies in competitive markets, this unit-specific data can be extremely sensitive, and is thus considered Confidential Business Information by those producers. NLA strongly urges EPA to provide the option for reporters to identify unit-specific data as CBI if the information has anti-competitive implications. The publication of such data can raise antitrust and anti-competition concerns and can allow competing lime producers, and makers of competing products, to have greater insight into lime production, operations of facilities, process equipment, and most importantly, calculation of product tonnages.

Response: The EPA is not taking final action at this time on the proposed addition of these three new data elements for each unit in the group greater than or equal to 10 mmBtu/hr when reporting using aggregation of units (unit type, maximum rated heat input capacity, and an estimate of the total annual heat input) and these three new data elements for each unit in the group greater than or equal to 10 mmBtu/hr when reporting using the common pipe configuration (unit type, maximum rated heat input capacity, and an estimate of the total annual heat input) to subpart C. See section III.C.2 of the preamble to the final rule.

6.0 Comments on Subpart F of Part 98

6.1 Comments on the request for comments on the addition of reporting methodology for emissions from low voltage anode effects (LVAE)

Commenter Name: Curt Wells
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0218-A1
Comment Excerpt Number: 1

Comment Excerpt: The Association supports EPA's proposal to update Subpart F to align with the IPCC's 2019 Refinement and the 2020 International Aluminium Institute's (IAI) "Good Practices Guidance: Measuring Perfluorocarbons" and appreciates the opportunity to offer feedback on a number of measurement and methodology changes under consideration. However, the Association is concerned about the proposal to further develop emission factors for Low Voltage Anode Effects (LVAEs). As EPA notes, emissions from Low Voltage Anode Effects (LVAE) have not been previously reported due to a lack of data and measurement methodology. The 2019 Refinement document coupled with the IAI Good Practice Guidance address this gap. Given the limited data and the only recently available measurement methodologies, the Association recommends the EPA delay reporting of these emissions for three years after final rule promulgation to allow regulated sources time to become familiar with the methods and perform the testing.

Sources could use the Tier 1 defaults provided in the 2019 Refinement document, however, these defaults carry a large uncertainty range between -98% to +247%. Emission measurement will provide a more representative result and the Association recommends the EPA delay including these emissions until more experience and certainty exists with the measurement methodologies. Given the small number of operating smelters in the USA, US EPA can choose to use the Tier 1 emission factors for reporting into the US GHG Inventory. As this is a still developing area of research and measurement, the Association recommends that EPA incorporate flexibility into the options for estimating LVAE-related PFC emissions and allow the use of any of the methods noted in the 2020 IAI Good Practice Guidance.

Response: The EPA acknowledges the commenter's support for the methodology changes under consideration and concern for the date of initial reporting. The EPA requested comment on these potential revisions but the EPA is not taking final action on any changes to the measurement methodology for subpart F at this time. The EPA may consider these changes in future rulemakings.

6.2 Comments on revisions to reporting (40 CFR 98.66)

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA is specifically interested in input on potential plans to extend the reporting requirements to include annual aluminum production capacity of the facility and annual days of operation for each potline. The Agency indicates that this data is to be collected so that EPA can use capacity and operating days for "understanding variations in annual emissions, to understand trends across the sector and to support analysis of this source." Facility-wide production capacity information is already reported in company annual reports. Additionally, the production capacity does not vary annually, nor would it necessarily illuminate the reason for emissions increasing or decreasing, as emissions can increase or decrease based on factors, such as the frequency of anode effects, that are unrelated to production.

Regarding operating days, there is minimum additional burden associated with this additional data element, but since primary aluminum production is a 24-hour a day operation, operating day information may also not shed light on emission increases or decreases, except where a potline is curtailed or re-started during the year.

Response: The EPA is not taking action at this time regarding the reporting of these two additional data elements but may consider it in the future. Regarding the commenter's recommendation that the EPA require submission of an explanation for year-over-year emissions variation, the EPA's electronic Greenhouse Gas Reporting Tool (e-GGRT) currently has a similar feature in which reporters have the opportunity to optionally explain year-over-year variation in emissions.

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 4

Comment Excerpt: Rather than requiring reporting of capacity and days of operation information, neither of which may illuminate reasons for emission increases or decreases, the Aluminum Association proposes that EPA instead require that Subpart F regulated entities provide an explanation if emissions increase or decrease year-over-year plus or minus five percent or more. Providing an explanation would capture the various reasons that emissions could have increased or decreased, such as due to changes in production rates or non-production rate related reasons such as a change in anode effect frequencies. Requiring the submission of an explanation would trigger the regulated entity to enter a comment into the reporting tool to explain the reason for the increase or decrease, consistent with what is done in annual emissions reporting that many companies do in accordance with the WRI GHG Protocol and other sustainability related reporting programs. If this approach is adopted, the Association requests that these explanations be given confidential treatment, as they may include confidential business information.

Response: The EPA is not taking final action at this time on the proposed requirements to report annual production capacity and annual days of operation for each potline (proposed 40 CFR 98.66(a) and (g)). See response to comment EPA-HQ-OAR-2019-0424-0301-A1, Excerpt 1.

6.3 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart F

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 5

Comment Excerpt: If the Agency proceeds with requiring the imprecise data element of annual capacity, the Association requests that capacity be clarified to mean maximum rated throughput. The EPA seeks to understand "changes in yearly production" and "variations of annual emissions," which could only be understood by measuring changes in actual production, since capacity is constant from year-to-year. If the EPA is requesting actual annual production values or if the language remains ambiguous, that information is confidential, and, if necessary to report, would need to be classified as confidential business information. However, using the explanatory comment approach described prior would be best to avoid misinterpretation and handling of sensitive information, while providing EPA with more information on annual emission and non-production related variations than the current proposal would.

Response: The EPA is not taking final action at this time on the proposed requirements to report annual production capacity and annual days of operation for each potline (proposed 40 CFR 98.66(a) and (g)). See response to comment EPA-HQ-OAR-2019-0424-0301-A1, Excerpt 1.

7.0 Comments on Subpart G of Part 98

Commenter Name: Reagan Giesenschlag
Commenter Affiliation: The Fertilizer Institute (TFI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0210-A1
Comment Excerpt Number: 3

Comment Excerpt: The Proposed Rule would make a number of modifications to existing Subpart G of the GHGRP to address TFI's prior concerns regarding the CO_2 that is consumed in urea production and not emitted to the atmosphere at ammonia production facilities.[10] In particular, EPA proposes to revise Subpart G to require the reporting of "the GHG emissions that occur directly from the ammonia manufacturing process (*i.e.*, net CO_2 process emissions) after subtracting out carbon or CO captured and used in other products." TFI supports EPA's proposed amendments to Subpart G and appreciates EPA's willingness to consider and act upon TFI's recommendations. Under EPA's proposed framework, reported GHG emissions from

Subpart G facilities will accurately reflect direct emissions at the facility and ensure consistency among the various sectors regulated under the GHGRP.

Footnotes

[10] Fed. Reg. at 36927, 36941-943, 37044-046 (proposed 40 C.F.R. Part 98, Subpart G).

Response: EPA acknowledges the commenter's support of the proposed modifications to calculate net CO_2 process emissions from subpart G. However, the EPA is not taking final action on the requirement to calculate and report net CO_2 process emissions at this time. See sections III.E and III.K.2 of the preamble to the final rule for additional information.

8.0 Comments on Subpart H of Part 98

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 6

Comment Excerpt: EPA proposes to collect annual averages of chemical composition inputs of calcium and magnesium oxides for cement kilns covered by Subpart H. 87 Fed. Reg. at 36943. While this is a desirable change, there is also a need for more information on kiln fuel inputs. Current data does not include the amounts of fuel input into cement kilns. However, such information is important for understanding the expected kiln flue gas composition, which in turn is necessary for evaluating options to decarbonize the cement sector.

Response: Currently, 40 CFR part 98, subpart H does not mandate facilities with CEMS to report fuel input data. The EPA did not propose, and is not finalizing, requirements related to the amount of fuel input into cement kilns. This comment is out of scope for this rulemaking and the EPA is not taking final action at this time. The EPA may consider this request in a future rulemaking.

Commenter Name: Sean O'Neill
Commenter Affiliation: Portland Cement Association (PCA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0211-A1
Comment Excerpt Number: 4

Comment Excerpt: PCA opposes the revisions to Subpart H in the Proposed Rule that would add additional requirements for much of the cement industry, which reports CO_2 emissions using CEMS as required under Part 98. These additional data submission requirements would be unnecessarily burdensome, would not provide EPA with any additional insight into cement

industry GHG emissions, and would not enhance the quality and accuracy of industry emissions data as EPA claims.

In the Proposed Rule, EPA reasons that additional data points are needed to estimate and check the accuracy of process and combustion emissions as both are vented through the same stack, but the additional data points that have been proposed to be collected are unnecessarily burdensome. EPA would be essentially requiring kilns that are currently using CEMS to report GHG emissions under Part 98 to verify its emissions data by doing the mass-balance method in addition to report their additional data points. To do this additional data reporting, additional recordkeeping and raw material sampling would be necessary, which is overly burdensome in addition to the already burdensome requirements of reporting through a CEMS. The Part 98 regulations already require extensive quality assurance and quality control (QA/QC) requirements for kilns required to use CEMS and there is no justification provided by EPA to question the accuracy of this data. This is especially true in light of the fact that EPA has previously reasoned that using CEMS is the most accurate method of determining kiln emissions from a stack.

EPA can easily and accurately determine the amount of process emissions using already reported data, total kiln stack emissions data and combustion emissions data, which is included in the confidential monthly clinker production data and fuel use data provided using the tier 4 methodology in Subpart C.[13] It is well established by the scientific community that process emissions represent 60% of CO_2 emissions from the kiln as that is the standard chemistry of the cement manufacturing process. [14] Because the data already reported accurately outlines cement industry process, combustion, and total emissions, there is no reason to report the additional data.

Footnotes

[13] 40 CFR § 98.33(b)(4)

[14] Getting the Numbers Right Database, Global Cement and Concrete Association

Response: See section III.F.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Sean O'Neill
Commenter Affiliation: Portland Cement Association (PCA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0211-A1
Comment Excerpt Number: 7

Comment Excerpt: A similar argument can be made in respect to the mass-balance method for calculating kiln CO_2 emissions, which is based on mass, carbonate content, and a fraction of calcination for each carbonate-based material. EPA can readily determine both process and combustion emissions through existing reporting obligations under Part 98. The additional proposed data elements would be burdensome to collect and would not add any additional information about or context to the cement industry's GHG emissions. Additionally, the

reporting of total and non-calcined CaO and MgO is irrelevant to calculating CO_2 process emissions as they are inherently non-carbonate - in the raw materials or the clinker. In reference to the proposed cement kiln dust (CKD) reporting requirement, for the industry to calculate the CKD not recycled and the quantity of raw kiln feed at all kilns within a facility is unduly burdensome, as it would not provide the EPA with any additional context about CO_2 process emissions than that which that can already easily be calculated using existing data reporting requirements.

PCA also questions the need for this additional data as there is no discussion in the rule preamble for how the additional data will be used by EPA, separately from potentially verifying process emissions.[15] PCA is concerned that this data can potentially be misused to justify regulatory overreach from other programs within EPA.

Footnotes

[15] 87 Fed. Reg. at 36943

Response: See section III.F.2 of the preamble to the final rule for the EPA's response to this comment.

9.0 Comments on Subpart I of Part 98

9.1 Revisions to calculation methodology for stack testing (40 CFR 98.3(i))

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 9

Comment Excerpt: SIA first requests that EPA continue to use the "stack system" nomenclature for stack testing, consistent with previous mandatory reporting rule publications as well as 2019 IPCC. The proposed changes within the preamble use the term "all stacks" and SIA requests that language in the rule should retain the term "stack systems."

EPA proposes that all stacks be tested based on the erroneous assumption that "... the number of stacks at each fab is expected to be small (*e.g.*, 1-2)..." Based on an August 2022 survey of nine SIA member companies, responding member companies counted over 250 stacks that would require testing under the existing stack testing methodology for the 33 fabs surveyed, as well as more than 170 additional process stacks that do not contain fluorinated GHG's (for example: general fab exhaust). Based on physical stack or stack system testing as well as the subsequent data processing and analysis, stack test costs are estimated at about $10,000 USD per sampling location plus an approximate $20,000 mobilization fee per testing event plus an average of $10,000 of infrastructure preparation (scaffolding, duct drilling, provision of electricity for testing equipment, etc.). Assume 12 stack systems require testing, the cost of one stack testing event per fab can average approximately $150,000 per site. For difficult or large testing events, the cost can be as much as $700,000 USD to test all GHG-containing process stack systems.

Adding stacks that do not have the potential to emit fluorinated greenhouse gases to stack testing scope would add an additional $60,000 to $200,000 per testing event and as much as $400,000 for large sites.

SIA strongly requests EPA clarify that the testing is required for all operating stacks or stack systems that have the potential to emit fluorinated greenhouse gases. The proposed language requires a very large expansion in the testing scope and testing costs with no added emissions accuracy.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 10

Comment Excerpt: Since its inception in 2014, EPA data indicate that no U.S. semiconductor facilities have used the stack testing method as a basis for reporting. SIA appreciates EPA's efforts to revise the stack testing method portion of Subpart I to simplify the method and reduce the burden on reporting facilities. However, the proposed revision to the stack testing method remains very complex. SIA does not expect member companies to use this method, as proposed, due to its complexity and marked difference to stack criteria air pollutant compliance calculations.

SIA supports the removal of the preliminary stack testing calculation process within 40 CFR 98.93(i). SIA suggests alignment with stack testing methods that various regulatory agencies require for criteria air pollutant annual reporting that are in current air permits. These stack testing methods for criteria pollutants require the testing of operating stack systems that have the potential to emit the pollutant being measured. The tested emissions from all operating stacks or stack systems are then summed into a tested mass emission rate. The production rate during the testing is also tracked. Emissions are then calculated using the stack testing emission rate and multiplying by a production scalar (for example, monthly or annual production divided by production rate at time of testing). These stack testing events are repeated on an ongoing basis ranging from annual to once every 5 years. This criteria pollutant stack testing methodology supports both POU as well as facility-level GHG abatement control Strategies.

Table 2 provides a comparison of an example criteria air pollutant stack testing calculation methodology as compared to the stack testing methodology for F-GHG's. The less complicated criteria air pollutant stack testing methodologies are widely accepted for compliance demonstration. SIA requests that EPA consider a stack testing methodology that can be simplified and used for both facility-level GHG abatement devices as well as POU abatement control.

[See DCN EPA-HQ-OAR-2019-0424-0191-A1, pg. 20 for Table 2: Comparison of typical semiconductor stack testing methodologies for criteria pollutants and GHG's]

The current GHG stack test method is excessively onerous and, while simplifications are proposed, the stack test requirements remain onerous and more complex than criteria pollutant stack testing. The proposed F-GHG stack testing methodology is time, resource and cost prohibitive, thus, SIA requests the final rule include an option for facilities to simplify further to align with criteria emissions testing programs.

Response: The commenter's suggested change to the stack testing method, to rely primarily on simultaneous stack measurements and production measurements, goes beyond the scope of the proposed changes in this rulemaking. The commenter may also be underestimating the complexity of measurements and calculations needed to demonstrate compliance with certain criteria pollutant and hazardous pollutant programs (*e.g.*, the NSPS under 40 CFR pat 60 and the NESHAP under 40 CFR part 63). For example, the compliance calculations for certain NSPS and NESHAP require monitoring the amount and pollutant content of each process input, the amounts used in controlled and uncontrolled process units, the efficiency of the control devices, and the amount of pollutant contained in waste materials shipped offsite. There are no changes to the rule as a result of this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 11

Comment Excerpt: SIA requests that, for emissions close to maximum field detection limits (FDL's) or intermittently below FDL's, default emission factor methods can be used instead of detection limits or one-half detection limits. In a representative calculation, one semiconductor fab quoted an annual flow of 1.25 million dry standard cubic feet (dscf) per year of exhaust through which fluorinated greenhouse gases are emitted. Based on flows and stack concentrations of one-half detection limit, an example CH_2F_2 stack testing result is 15 times that of the default emission factor method. Due to high flow and low concentration of emissions from a semiconductor fab, individual gas emissions close to or below FDL's may be represented more accurately with the default emission factor method than with stack testing. As such, SIA requests that the rule specifically allow a hybrid approach where stack testing of individual F-GHGs can be used in conjunction with the default emission factor method for other F-GHGs. This hybrid method could also be used to estimate process N_2O emissions.

Response: The EPA did not propose or request comment on revisions to the maximum FDLs used in stack testing, as such, this comment is out of scope for this rulemaking. The EPA may consider these changes in a future rulemaking.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 23

Comment Excerpt: "The EPA requests comment on the extent to which the sources of N_2O formation from electronics manufacturing have been identified. We are also requesting comment on the expected variability of the estimated N_2O emission factor from stack testing if using the current or revised methods for estimating emissions using stack testing and whether new data are available."

N_2O emissions are generated from the use of N_2O as an input gas in thin films, diffusion, and other process operations. Additionally, N_2O can be generated from the combustion of hydrocarbon-based fuels in the presence of nitrogen and oxygen. This combustion N_2O is already accounted for in the emissions calculated from the combustion of natural gas and other fuel burning equipment inside and in support of the process fab. SIA believes further N_2O stack testing investigation is necessary before commenting on potential accuracy.

Response: The EPA acknowledges the information provided by the commenter on the sources of N_2O emissions and the need for additional stack testing.

9.2 Revisions to calculation methodologies for calculating utilization and by-product formation rates in the Technology Assessment Report

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 14

Comment Excerpt: Plasma etching and wafer cleaning are critical process steps in the manufacture of semiconductors and these steps use various F-GHG's applied individually or as a mixture of two or more F-GHG gases. In plasma etching, a dynamic solution of ions, electrons, and neutral species is generated to react and change the surface of semiconductor products. This highly energetic and reactive ion cloud is used to complete three basic steps in the overall etching manufacturing process: adsorption, product formation, and product desorption. The range of surface changes completed via plasma etching process can be as minute as the formation of nanometer unique 3D channels to larger removal of entire surface layers. As a result, the plasma etching processes used in manufacturing must be optimized across many variables including, for example: ion selectivity, etch rate, surface material type(s), potential for surrounding damage, and repeatability. To meet the requirements for successful manufacturing of advanced semiconductor products, many of the modern manufacturing plasma etch process recipes contain multiple GHG gases. EPA has identified three specific goals for the implementation of emission factors "in order to ensure that emission factors are developed in a

consistent manner across facilities and over time and to allow the EPA to compare emission factors across the industry and track trends in industry emission rates." These goals include:

> 1 — Calculating the same way as the emission factors already in the EPA's database to track technology changes and eliminate differences attributable to calculation methods,
>
> 2 — Be robust and broadly applicable to reflect physical reality as much as possible and to not be impacted by changing proportions of input gases, and
>
> 3 — Consistently calculating across facilities and processes to ensure that resulting defaults are not biased by "cherry-picking" of methods.

EPA proposes the semiconductor industry provide three sets of calculation data for each emissions test, tripling the reporting burden for technology emission factor data. In addition to the increased scope of data collection and integration, each of EPA's proposed methods fail to meet the three goals stated above, but for different reasons.

The "Dominant Input Gas" calculation method violates the physical reality of conservation of mass for multi-gas plasma etch / wafer cleaning processes and may lead to emission factors (1-U) greater than 1. Additionally, this method does not clearly define what gas would be dominant in situations where gases of equal or near-equal mass are used. The increased use of recipes using multiple gases also increases the probability of generating emission factors greater than 1 when characterizing process emissions and highlights the need for alternative emission factor integration methodology(s). To address this possibility, EPA sets a "cap" on the dominant input gas emission factor of 0.8. The use of a "cap" value does not meet the goal of calculating the same way as the emission factors already in EPA's database as well as it may amplify or obfuscate technology changes by setting an artificial maximum emission value.

The "All Input Gas" calculation method does not select a dominant gas, but rather calculates emission factors based on all input gases. While potentially decreasing the possibility of an emission factor greater than one as compared to the "Dominant Input Gas" calculation methodology, this method also violates the physical reality of conservation of mass for plasma etch / wafer cleaning processes when using multiple gases and may lead to byproduct emission factors (BEF) greater than 1. Capping the 'max (1-U)' value at 0.8 for individual testing does not align with the maximum seen within historical test data submitted by industry but is instead aligned with the maximum average EF across all gases. Again, by using an assumed emission factor within the calculation methodology, this method does not meet the goal of calculating the same way as the emission factors data existing in EPA's database and it may amplify or obfuscate technology changes by setting an artificial maximum emission value.

The "Reference Emission Factor" calculation method, as proposed, ties tested emission factors to historical or past submitted data. It is unclear how this method would be implemented and whether (1-U) or BEFs would be held constant. The method, as a whole, increases the difficulty in comparing individual tests depending on what is held constant. In addition, if new gases or byproducts are used or measured, the methodology will not have a reference emission basis to apply. Again, this method does not meet the goals listed by EPA in collecting emission factors consistently over time.

EPA proposes that emission factors be calculated using three different methods and that results be submitted for all three methods. The additional burden and complexity of calculating technology emission factors three different ways could be a disincentive to testing and will not improve overall emissions accuracy. Three sets of calculations result in the possibility that EPA will choose data that is not appropriate for the tested process.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 15

Comment Excerpt: Due to the limitations of all proposed technology report emission factor calculation methodologies, SIA requests that emissions be calculated using the multi-gas method in which carbon-based F-GHG emissions are assigned across all carbon-based input F-GHG's. SIA believes the multi-gas method would appropriately assign emissions, especially for recipes running more than two gases at once. The multi-gas method will also eliminate concerns regarding emission factors that do not meet conservation of mass principles. SIA believes the multi-gas emission factor calculation methodology supports the intent of identifying changes to emissions characteristics due to developments within semiconductor technologies.

To encourage additional tool level testing of existing and emerging technologies, we encourage EPA to add a single, multi-gas calculation methodology to the rule. In the "Multi-Gas" calculation method, all non-carbon-containing GHG's, such as SF_6 and NF_3, are attributed to the input of these non-carbon-containing GHG's. SF_6 emissions are divided by the input of SF_6 only and NF_3 emissions are divided by the input of NF_3 only. Carbon-containing emissions are attributed to all carbon containing input gases. Therefore, the emissions of input chemicals include byproduct formation from other source gases. This method ensures the conservation of mass, meeting EPA's goal of reflecting physical reality. Due to the relative unpredictability of plasma reactions depending on amount or concentration of input gases as well as plasma and manufacturing tool variables, any carbon-based byproduct could be generated by any carbon-based input gas. This relative unpredictability drives variability across single-gas emission factors, most falling anywhere between 0.1 to 0.9. High variability in emission factors is based on many factors, not just varying input gas proportions, as seen in the spread of emission factors within single gas data. For this reason, SIA suggests using the "Multi-Gas" method for simple, consistent, and robust emissions calculations. The "Multi-Gas" method generates emission factors consistent and within the range of the existing emission factor data. The "Multi-Gas" method is currently and will remain robust through future technology changes. This method accommodates new gases, changes in technology, and does not violate the physical reality of conservation of mass. And this method does not use past or assumed data to calculate emission

factors or byproduct emission factors, which supports EPA's goal to trace technology changes and not obfuscate with previous data.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

9.3 Comments on alternative methods for calculating utilization and by-product formation rates

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 22

Comment Excerpt: SIA would also like to provide brief comment in response to EPA's request within the preamble for feedback:

"The EPA requests comment on whether the gain in robustness achieved by capping 1-U values at 0.8 justifies the accompanying loss in comparability to previously submitted data, particularly given that we are proposing to require submission of results using both the historically used methods and the new, likely more robust, reference emission factor method.... In addition, the EPA requests comment on the use of 0.8 as the maximum 1-U value in the modified dominant-gas and all-input gas methods."

SIA believes there are limitations in all proposed emission factor calculation methodologies. While capping an emission factor at 0.8 is likely an adequate assumption for maximum emissions, it remains somewhat arbitrary. SIA suggests using an emissions calculation methodology that divides all emissions across all input gases. Input gas emissions are calculated as kilograms of input gas emitted divided by kilograms of all input gases used. Byproduct emissions are calculated as kilograms of byproduct emissions divided by kilograms of all input gases used.

Response: The EPA is keeping the maximum 1-U value at 0.8 as proposed. As discussed in the 2022 Data Quality Improvements Proposal, 0.8 represents an upper bound for input gas emission factors, and as noted by the commenter, this value is likely adequate for an assumption of maximum emissions. For the EPA's response to the comments on the advantages of different emission factor calculation methodologies, see the response to comment EPA-HQ-OAR-2019-0424-0191-A1, excerpt numbers 14 and 15.

9.4 Comments on proposed revisions to the frequency and applicability of the Technology Assessment Report

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 13

Comment Excerpt: SIA supports EPA's proposal to amend 98.96(y) to decrease the frequency of submission of technology assessment reports from every three years to every five years. As stated in the preamble:

"Under the current rule, semiconductor manufacturing facilities are required to submit their next technology assessment report by March 31st, 2023 (concurrent with their RY2022 annual report). This proposed revision would affect the due date for that technology assessment, moving the due date from March 31, 2023, to March 31, 2025."

We urge EPA to proceed with finalizing the amendment to 98.96(y) before the March 31° 2023 due date for the next technology assessment report.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 4

Comment Excerpt: The commenter supported changing the frequency to provide a technology assessment report from every three years to every five years.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

9.5 Revisions to default EFs and BEFs for semiconductors and other electronics manufacturers

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 19

Comment Excerpt: SIA supports proposed language regarding the removal of BEFs for C_4F_6, C_5F_8, COF_2 and C_2F_4. Byproduct emissions from the four chemicals identified are estimated to account for << 0.001% of overall GHG emissions from semiconductor manufacturing operations.

SIA requests that the rule clarify that carbon-containing byproduct emission factors are zero when calculating emissions from non-carbon containing input gases (SF_6, NF_3, F_2 or other noncarbon input gases) and when the film being etched or cleaned does not contain carbon. This language would align the EPA final rule with IPCC 2019.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 20

Comment Excerpt: SIA supports the update to input gas and BEF values based on conservative direct and byproduct emission pathways. SIA also supports the alignment of input gas and BEF values with 2019 IPCC values. In the Proposed Revisions to Improve the Quality of Data Collected for Subpart I, Updates to default emission factors and destruction or removal efficiencies to improve the accuracy of emissions estimates, EPA proposes in the preamble to:

"...revise the input gas and BEF values assigned to gas/process combinations where no default input gas emission factor is available... input gas EF (1-U) equal to 0.8... BEFs of 0.15 for CF_4 and 0.05 for C_2F_6..." EPA also proposes to "...update Table I–8 to include distinct utilization rates for N_2O... and by process type."

SIA supports the alignment of uncharacterized input gas and BEF default emission factors with 2019 IPCC values of 0.8, 0.15, and 0.5 for input gases, CF_4 and C_2F_6 respectively.

Response: The EPA acknowledges the commenter's support and is finalizing the updates as proposed.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 2

Comment Excerpt: The commenter supported updating input gas emission factor (EF) and byproduct emission factors (BEF) values in alignment with 2019 IPCC values in Table I–4.

Response: The EPA acknowledges the commenter's support and is finalizing the updates as proposed.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 21

Comment Excerpt: The commenter identified in a table recommended revisions to the proposed equation [Eq I–8B] as follows:

$BE_{kij}=B_{ijk} * C_{ij} * (1-(a_{kij} * d_{kij} * UT_{kij}))$

Replace B_{ijk} with B_{kij}.

Response: The EPA agrees with the commenter and is correcting Equation I–8B as recommended by the commenter.

9.6 Revisions to default destruction and removal efficiency (DRE) values and conditions under which default DREs can be claimed

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 25

Comment Excerpt: SIA supports the removal of process type from default DRE categories and supports the alignment of default DREs with 2019 IPCC. While most individual chemical DRE values generally align with 2019 IPCC, NF_3 DRE is a distinct outlier. 2019 IPCC sets NF_3 DRE at 95% with significant data submissions from U.S. EPA. EPA's current rule language proposal of 88% NF_3 DRE does not align with 2019 IPCC data and does not align with the technical support documentation provided by EPA.

SIA supports the proposals to assign default DREs to commonly used gases without distinguishing between process types and using the 96% NF_3 DRE as documented in EPA's technical support documentation (TSD) and August 25, 2022 docket memorandum update.

Response: The EPA acknowledges the commenter's support. The EPA updated and corrected the original proposal in the 2023 Supplemental Proposal (88 FR 32852, page 32873), and is finalizing the updates as described in the supplemental proposed rule and as recommended by the commenter.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 1

Comment Excerpt: The commenter supported resolving the gap for abatement with certified DREs lower than the published default DRE values in Table I–16 that have required annual testing or reported as unabated, and assigning updated default DREs for commonly used gases which do not distinguish between process types in Table I–16.

Response: The EPA acknowledges the commenter's support. The EPA updated and corrected the original proposal in the 2023 Supplemental Proposal (88 FR 32852, page 32873), and is finalizing the updates as described in the supplemental proposed rule.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 8

Comment Excerpt: SIA requests EPA clarify that reporters are not required to maintain supporting documentation on abatement units for which a DRE is not being claimed.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 5

Comment Excerpt: SIA believes the proposed increase in certification and documentation requirements beyond existing POU operational requirements will dissuade semiconductor companies from accounting for DREs from installed POU, resulting in an over-estimate of emissions from the semiconductor industry. Based on an internal SIA survey, 85% of fabs indicated they are less likely to claim default DRE values based on the proposed POU certification and documentation language. Zero fabs indicated they already have the proposed expanded certification and documentation for all POU, whereas 100% of fabs indicate this will

require additional time and resources from both semiconductor manufacturers and POU suppliers to collect and file additional POU information.

Often, POU suppliers provide high-level certifications specifying the parameters for which POU are considered certified to abate GHG's. Some POU devices have been in place for over 20 years and may no longer have the original supplier documentation with the additional data requirements. The existing 40 CFR Part 98 Subpart I rule language states that to use default DRE values in emissions calculations, required documentation is limited to the site maintenance plan, which shall include "manufacturer's recommendations and specifications for installation, operation, and maintenance..." SIA believes the existing language in Subpart I is sufficient to ensure proper POU device performance while being consistent with IPCC 2019. The requirement to provide supporting documentation of manufacturer certified POU DREs, including testing method, is burdensome and may be unachievable, especially for older abatement units.

SIA members comply with the manufacturer-specified performance requirements to ensure certified POU DREs are achieved. Adding operational elements of fuel and oxidizer settings, fuel gas flows and pressures, fuel calorific values, and water quality, flow and pressures to the POU DRE requirements are outside the manufacturer-specified requirements for emissions control. Additionally, many of these proposed expanded parameter tracking elements are not necessary to ensure accurate POU DREs. These and other POU default DRE certification and documentation requirements go above and beyond the 2019 IPCC and will make it more difficult for U.S. reporters to take credit for installed and future emissions control devices, resulting in a less accurate, overestimated U.S. GHG emissions inventory.

SIA requests EPA tailor the emission control device operational requirements for default POU DREs to align with the following 2019 IPCC refinement language: "...obtain a certification by the emissions control system manufacturers that their emissions control systems are capable of removing a particular gas to at least the default DRE in the worst-case flow conditions, as defined by each reporting site." SIA requests EPA remove the requirement to provide supporting documentation for all abatement units using certified default or lower than default DREs.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 5

Comment Excerpt: The commenter argued aspects of EPA's proposal are flawed and would present major issues and challenges as follows:

EPA's proposed rule is premised on its Clean Air Act (CAA) Section 114 authority. See 88 Fed. Reg. 32857 ("The EPA is proposing these rule amendments under its existing CAA authority

provided in CAA section 114…. CAA section 114(a)(1) provides the EPA broad authority to require the information proposed to be gathered by this rule because such data would inform and are relevant to the EPA's carrying out of a variety of CAA provisions.") However, EPA's authority to seek information under CAA Section 114 is bound by a standard of reasonableness (see, *e.g.*, United States v. Xcel Energy, Inc., 759 F. Supp. 2d 1106, 1114-15 (D. Minn. 2010)) and certain aspects of EPA's proposal are unreasonable and accordingly would not withstand judicial scrutiny. The most unreasonable aspect of EPA's proposal involves the very prescriptive proposed abatement operation, maintenance, and performance verification requirements that must be met before using default or lower DRE in emission calculations.

These requirements go beyond those documented in 2019 IPCC, increase regulatory reporting burdens, and likely result in less accurate, overestimated U.S. GHG emissions inventories. To the extent EPA seeks to impose new abatement operation, maintenance, or performance verification requirements, EPA should apply such requirements only to equipment purchased after the reporting rule becomes effective, which would align with the originally proposed 40 C.F.R. 98.97(d)(1)(iii). For equipment purchased or installed before the rule's effective date, previous reporting protocols would be appropriate in order to employ default DRE or lower manufacturer specified DRE in emission calculations.

The GHG Reporting Program (GHGRP) was originally proposed to enable collection of industry-wide data to better inform EPA on required regulatory action that should be taken under the Clean Air Act. EPA states that the impact of proposed changes on other entities and programs was not considered in the proposed rule updates, Intel is concerned that Subpart I can become the basis for monitoring, calculating, and reporting of GHG emissions at any source in the US where GHGs become subject to regulation under the Tailoring rule. The semiconductor industry is entering a period of growth in the United States, and these changes which increase complexity of monitoring and reporting of GHGs put some US semiconductor facilities at a competitive disadvantage compared to those manufacturing overseas. Intel has existing greenhouse gas permits for our Oregon manufacturing facility and will have permit limits at our Ocotillo and Ohio sites due to the continued investment in manufacturing in the United States. The requirements for reporting compliance to those permits require use of the MRR protocols, or permitting agencies model calculating and reporting based off the rule. Any significant changes to the MRR must consider any potential downstream impacts whether intended or unintended to maintain US semiconductor competitiveness globally as the industry expands its manufacturing footprint.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 6

Comment Excerpt: We share concerns regarding the following language in the proposed rule:

"Operation of the abatement system must be within manufacturer's specifications, including but not limited to specifications on vacuum pumps' purges, fuel and oxidizer settings, supply and exhaust flows and pressures, and utilities to the emissions control equipment including fuel gas flow and pressure, calorific value, and water quality, flow and pressure."

Abatement equipment installed across the industry does not have manufacturer specifications for all listed parameters or the capability to track all listed parameters. Installed equipment is designed to meet manufacturer certified DREs without requiring the complex control schemes defined in the proposed rule. Existing equipment is continuously monitored for relevant parameters and alerts the operator to take appropriate action to resolve issues if or when they arise and to not include impact of abatement DRE on reported emissions until the abatement is returned to operation within the relevant manufacturer specifications. Intel agrees with SIA that the existing language in Subpart I is sufficient to ensure proper POU device performance while being consistent with IPCC 2019.

Adverse Impact: To develop new abatement technology and convert or replace more than [REDACTED AS CONFIDENTIAL BUSINESS INFORMATION] installed abatement units in each fab – so as to add the monitoring and controls necessary to meet the proposed rule requirements in order to take credit for installed abatement and avoid inaccurately reporting elevated, unabated emissions – estimated to cost from [REDACTED AS CONFIDENTIAL BUSINESS INFORMATION] per abatement for a retrofit to full replacement.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 8

Comment Excerpt: We share concerns regarding the following language in the proposed rule:

"Requirements for vendor testing for all POU models for every chemistry with certified DRE that meets (or exceeds) default values in Table I–16 or lower than default."

Abatement equipment manufacturers vendors certify performance for all F-gas GHGs and N_2O based on testing for a select subset of all manufacturing chemicals that are the most stable and difficult to destruct, which drives the most rigorous operational specification for each abatement model. It would be especially burdensome for abatement vendors to be required to provide this

level of verification since abatement installed at every manufacturing facility do not currently have this required documentation nor do the vendors have the capability to test every chemical used in semiconductor manufacturing for every existing abatement model. Intel agrees with the SIA recommendation to align abatement operational requirements with the following 2019 IPCC refinement language: "…obtain a certification by the emissions control system manufacturers that their emissions control systems are capable of removing a particular gas to at least the default DRE in the worst-case flow conditions, as defined by each reporting site."

Adverse Impact: Verification testing is estimated to take approximately 20 weeks per chemistry and may take up to 2+ years for individual vendors to have required documentation. Any "unverified" abatement model and chemistry configuration requires emissions to be reported as unabated and results in artificial increases in reported emissions

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 10

Comment Excerpt: The commenter identified in a table recommended revisions to the proposed requirements at 98.94(f)(3) as follows:

If you use default destruction and removal efficiency values in your emissions calculations under § 98.93(a), (b), and/or (i), you must certify and document that the abatement systems at your facility for which you use default destruction or removal efficiency values are specifically designed for fluorinated GHG or N_2O abatement, as applicable, ~~and that the abatement system has been tested by the abatement system manufacturer based on the methods specified in paragraph (f)(3)(i) of this section and verified to meet (or exceed) the default destruction or removal efficiency in Table I–16 for the fluorinated GHG or N_2O~~ under worst-case inlet fluorinated GHG or N_2O flow conditions as defined in paragraph (f)(3)(ii) of this section. If you use a ~~verified~~ certified destruction and removal efficiency value that is lower than the default in Table I–16 in your emissions calculations under § 98.93(a), (b), and/or (i), you must certify and document that the abatement systems at your facility for which you use the ~~verified~~ certified destruction or removal efficiency values are specifically designed for fluorinated GHG or N_2O abatement, as applicable, ~~and that the abatement system has been tested by the abatement system manufacturer based on the methods specified in paragraph (f)(3)(i) of this section and verified to meet or exceed the destruction or removal efficiency value used for that fluorinated GHG or N_2O~~ under worst-case inlet fluorinated GHG or N_2O flow conditions as defined in paragraph (f)(3)(ii) of this section. If you elect to calculate fluorinated GHG emissions using the stack test method under § 98.93(i), you must also certify that you have included and accounted for all abatement

systems designed for fluorinated GHG abatement and any respective downtime in your emissions calculations under § 98.93(i)(3).

Response: The EPA is finalizing the new documentation requirements for POU abatement devices purchased and installed after the effective date of the final rule (January 1, 2025), and maintaining the current certification and documentation requirements for older POU abatement devices. Therefore, we have not adopted the commenter's recommended changes. See section III.G.2 of the preamble to the final rule for additional information on the final requirements.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 12

Comment Excerpt: The commenter identified in a table recommended revisions to the proposed requirements at [98.94(f)(4)] as follows:

If you calculate and report controlled emissions using neither the default destruction or removal efficiency values in Table I–16 of this subpart nor a manufacturer ~~verified~~ certified lower destruction or removal efficiency values per paragraph (f)(3) of this section, you must use an average of properly measured destruction or removal efficiencies for each gas and process sub-type or process type combination, as applicable, determined in accordance with procedures in paragraphs (f)(4)(i) through (vi) of this section. This includes situations in which your fab employs abatement systems not specifically designed for fluorinated GHG or N_2O abatement and you elect to reflect emission reductions due to these systems. You must not use a default value from Table I–16 of this subpart for any abatement system not specifically designed for fluorinated GHG and N_2O abatement, for any abatement system not certified to meet the default value from Table I–16, or for any gas and process type combination for which you have measured the destruction or removal efficiency according to the requirements of paragraphs (f)(4)(i) through (vi) of this section.

Response: See response to comment EPA-HQ-OAR-2019-0424-0299-A1, Excerpt 10.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 14

Comment Excerpt: The commenter identified in a table recommended revisions to the proposed requirements at [98.96(q)(2)] as follows:

If you use default destruction or removal efficiency values in your emissions calculations under § 98.93(a), (b), or (i), certification that the site maintenance plan for abatement systems for which emissions are being reported contains manufacturer's recommendations and specifications for installation, operation, and maintenance for each abatement system. To use the default or lower manufacturer ~~verified~~ certified destruction or removal efficiency values, operation of the abatement system must be within manufacturer's specifications.

Response: See response to comment EPA-HQ-OAR-2019-0424-0299-A1, Excerpt 10.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 15

Comment Excerpt: The commenter identified in a table recommended revisions to the proposed requirements at [98.94(f)(3)] as follows:

If you use default destruction and removal efficiency values in your emissions calculations under § 98.93(a), (b), and/or (i), you must certify and document that the abatement systems at your facility for which you use default destruction or removal efficiency values are specifically designed for fluorinated GHG or N_2O abatement, as applicable, ~~and that the abatement system has been tested by the abatement system manufacturer based on the methods specified in paragraph (f)(3)(i) of this section and verified~~ certified to meet (or exceed) the default destruction or removal efficiency in Table I–16 for the fluorinated GHG or N_2O under worst-case flow conditions as defined in paragraph (f)(3)(ii) of this section. If you use a ~~verified~~ certified destruction and removal efficiency value that is lower than the default in Table I–16 in your emissions calculations under § 98.93(a), (b), and/or (i), you must certify and document that the abatement systems at your facility for which you use the ~~verified~~ certified destruction or removal efficiency values are specifically designed for fluorinated GHG or N_2O abatement, as applicable, under worst-case flow conditions as defined in paragraph (f)(3)(ii) of this section.

Response: See response to comment EPA-HQ-OAR-2019-0424-0299-A1, Excerpt 10.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 17

Comment Excerpt: The commenter identified in a table recommended revisions to the proposed requirements at [98.97(d)(1)(iii)] as follows:

If you use default destruction or removal efficiency values in your emissions calculations under § 98.93(a), (b), and/or (i), certification that the abatement systems for which emissions are being reported were specifically designed for fluorinated GHG and N_2O abatement, as required under § 98.94(f)(3), and certification that the site maintenance plan includes manufacturer's recommendations and specifications for installation, operation, and maintenance for all applicable abatement systems.(iii) If you use either default destruction or removal efficiency values or certified destruction or removal efficiency values that are lower than the default values in your emissions calculations under § 98.93(a), (b), and/or (i), certification that the abatement systems for which emissions are being reported were specifically designed for fluorinated GHG and N_2O abatement, as required under § 98.94(f)(3), certification that the site maintenance plan includes the abatement system manufacturer's recommendations and specifications for installation, operation, and maintenance, and the certified destruction and removal efficiency values for all applicable abatement systems. ~~For abatement systems purchased after January 1, 2023, also include records of the method used to measure the destruction and removal efficiency values.~~

Response: See response to comment EPA-HQ-OAR-2019-0424-0299-A1, Excerpt 10.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 18

Comment Excerpt: The commenter identified in a table the proposed requirements at [98.97(d)(6)] as follows:

Records of all inputs and results of calculations made accounting for the uptime of abatement systems used during the reporting year, in accordance with Equations I–15 or I–23 of this subpart, as applicable. The inputs should include an indication of whether each value for destruction or removal efficiency is a default value, lower manufacturer ~~verified~~ certified value, or a measured site specific value.

Response: See response to comment EPA-HQ-OAR-2019-0424-0299-A1, Excerpt 10.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 19

Comment Excerpt: The commenter identified in a table recommended revisions to the proposed requirements at [98.97(d)(9)(i) and 98.97(d)(9)(ii)] as follows:

The site maintenance plan for abatement systems must be based on the abatement system manufacturer's recommendations and specifications for installation, operation, and maintenance if you use default or lower manufacturer ~~verified~~ certified destruction and removal efficiency values in your emissions calculations under § 98.93(a), (b), and/or (i). If the manufacturer's recommendations and specifications for installation, operation, and maintenance are not available, you cannot use default destruction and removal efficiency values or lower manufacturer verified value in your emissions calculations under § 98.93(a), (b), and/or (i). If you use an average of properly measured destruction or removal efficiencies determined in accordance with the procedures in § 98.94(f)(4)(i) through (vi), the site maintenance plan for abatement systems must be based on the abatement system manufacturer's recommendations and specifications for installation, operation, and maintenance, where available. If you deviate from the manufacturer's recommendations and specifications, you must include documentation that demonstrates how the deviations do not negatively affect the performance or destruction or removal efficiency of the abatement systems.

The site maintenance plan for abatement systems must include a defined preventative maintenance process and checklist. Preventative maintenance must include, but is not limited to, calibration of pump purge flow indicators. Pump purge flow indicators must be calibrated each time a vacuum pump is serviced or exchanged.

Response: See response to comment EPA-HQ-OAR-2019-0424-0299-A1, Excerpt 10.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 20

Comment Excerpt: The commenter identified in a table recommended revisions to the proposed requirements at [98.98] as follows:

Operational mode means the time in which an abatement system is properly installed, maintained, and operated according to the site maintenance plan for abatement systems as required in § 98.94(f)(1) and defined in § 98.97(d)(9). ~~This includes being properly operated within the range of parameters as specified in the site maintenance plan for abatement systems and within the range of parameters as specified in the DRE certification documentation.~~ An abatement system is considered to not be in operational mode when it is not operated and maintained according to the site maintenance plan for abatement systems and within the range of parameters as specified in the DRE certification documentation.

Response: See response to comment EPA-HQ-OAR-2019-0424-0299-A1, Excerpt 10. The EPA is keeping the sentence the commenter recommended deleting because it is important to the final revised definition of "operational mode." However, because the EPA is making some of the new certification documentation requirements applicable to only abatement systems installed after January 1, 2025, the EPA has added the following language: "For abatement systems purchased and installed during or after calendar year 2025, this includes being properly operated within the range of parameters as specified in the DRE certification documentation. An abatement system is considered to not be in operational mode when it is not operated and maintained according to the site maintenance plan for abatement systems or, for abatement systems purchased and installed during or after calendar year 2025, not operated within the range of parameters as specified in the DRE certification documentation."

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 6

Comment Excerpt: The inclusion of a low flow certification boundary is unduly restrictive and should not be considered within default DRE requirements. The measurement methodology drives a minimum field detection limit (FDL) and DREs can only be measured with accuracy if the concentration is above FDL's. The methods do not address destruction of low levels of GHG. This does not mean there is no destruction of the GHG but only that it cannot be measured accurately at levels below an instrument detection level. DREs measured at maximum flow conditions will be a worst case and should therefore be applied to all flows below maximum. SIA requests the use of maximum flow certified manufacturers' DREs without restricting application of DRE below detection limits; otherwise, DRE tracking and calculation complexity would significantly increase, and emissions accuracy would decrease. 2019 IPCC refers to the worst-case flow conditions as "...the highest total FC [fluorinated compound] or N_2O flows through each model of emissions control systems (gas by gas and process type by process type across the facility) and highest total flow scenarios ..." with no mention of low-flow or additional control parameters.

SIA requests that the worst-case flow definition align with the IPCC definition of highest total fluorinated compound or N_2O flows and highest total flow scenario. DREs measured at maximum flow conditions will be a worst case and should therefore be applied to all flows below maximum.

Response: The EPA agrees with the commenter that the DRE should be measured at maximum combined flows, and this is the approach in the proposed definition of "worst case flow conditions" in 40 CFR 98.94(f)(3)(ii). The EPA recognizes that the preamble language referring to "a range of total F-GHG or N_2O flows and total gas flows" (87 FR 36920, page 36953) could be construed as a requirement to also have a low flow certification, but this is not the case with the proposed rule language, which is consistent with the 2019 IPCC.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 11

Comment Excerpt: The commenter identified in a table recommended revisions to the proposed requirements at [98.94(f)(3)(ii)] as follows: Worst-case flow conditions are defined as the highest total fluorinated GHG or N_2O flows through each model of emissions control systems (gas by gas and process type by process type across the facility) ~~and the highest total flow scenarios (with N_2 dilution accounted for) across the facility~~ during which the abatement system is claimed to be operational.

Response: See response to comment EPA-HQ-OAR-2019-0424-0299-A1, Excerpt 10. The EPA is keeping the text that the commenter recommended deleting because scientifically sound, industry-accepted DRE measurement methodologies, such as EPA 430-R-10-003, account for N_2 dilution.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 7

Comment Excerpt: SIA further requests EPA include language supporting full uptime for emission control devices interlocked with manufacturing tools or with abatement redundancy.

SIA supports 2019 IPCC language that: "Inventory compilers should also note that UT [uptime] may be set to one (1) if suitable backup emissions control equipment or interlocking with the process tool is implemented for each emissions control system. Thus, using interlocked process tools or backup emissions control systems reduces uncertainty by eliminating the need to estimate UT for the reporting facility." SIA believes such language will drive further use of manufacturing tool interlocks or emission control system redundancy while having the added benefit of simplifying uptime tracking of individual POU.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

9.7 Revisions to incorporate calculations of CF_4 byproduct from hydrocarbon fueled abatement systems

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 16

Comment Excerpt: The data upon which CF_4 byproduct emissions from hydrocarbon-fuel-based emissions control system abatement of F_2 gas (from etch or remote plasma chamber cleaning processes) is based on limited and unverified data. The values documented within 2019 IPCC and referenced within EPA's rule proposal are ultimately based on a single, confidential data set from one abatement supplier. SIA is concerned that developing regulatory language around this single, unverified data set does not accurately represent the CF_4 byproduct emissions from the uses or generation of F_2 and may deliver an advantage to the single emissions control system supplier that provided the data.

SIA has a number of concerns with the information provided within the 2019 IPCC and EPA proposed rule supporting documentation upon which the CF_4 byproduct ($AB_{CF4,F2}$ and $B_{F2,NF3}$) is based.

- The F_2 emission values presented in "Influence of CH_4-F_2 mixing on CF_4 byproduct formation in the combustive abatement of F_2" by Gray & Banu (2018) are based on testing conducted in a lab under conditions that are not found in actual semiconductor abatement installations. Test methods do not appear to adhere to those specified in industry standard test methods or the EPA DRE Protocol. F_2 results are measured from a device, the MST Satellite XT, designed to provide "nominal" F_2 concentrations meant for health and safety risk management and not for environmental emissions measurement.
- "FTIR spectrometers measure scrubber abatement efficiencies" by Li, et al. (2002) and "Thermochemical and Chemical Kinetic Data for Fluorinated Hydrocarbons" by Burgess, et al. (1996) provide anecdotal and hypothetical emission pathways for the combustion of fluorinated gases, but do not confirm reliable and peer reviewed CF_4 emission results from current semiconductor manufacturing use or generation of F_2.
- Finally, EPA references a single, confidential data set from Edwards, Ltd (2018) upon which numerical $AB_{CF4,F2}$ and $B_{F2,NF3}$ values are based. This single data set of 15 measurements refers to an RPC NF_3 to F_2 emission value based on mass balance. SIA does not support using the data provided by Edwards confidentially without the ability to review the underlying data and experimental procedure of the 15 measurements upon which the RPC NF_3 to F_2 emission factor was based. Mass balance has shown to be a highly conservative method in estimating emission factors and this confidential data set lacks visibility into repeatability, experimental design, and semiconductor process applicability.

Because $AB_{CF4,F2}$ and $B_{F2, NF3}$ are based on a single set of supplier data, SIA is concerned this single supplier will have a marked advantage in demonstrating compliance with proposed requirements.

SIA requests EPA remove the requirement to calculate CF_4 emission byproduct from hydrocarbon-fuel-based emissions control systems that abate F_2 or remote plasma clean (RPC) NF_3. The data upon which these values are based are not peer reviewed, are based on assumptions, and appear to be based on emissions measurement values that did not use industry standards or the EPA DRE testing protocols.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 18

Comment Excerpt: As proposed, EPA requires the addition of calculated CF_4 emissions from HC fuel CECS abatement of F_2 based on Equation I–9 if the HC fuel CECS is not certified to not convert F_2 at less than 0.1%. This requirement appears to apply to all relevant HC fuel CECS regardless of whether a default or measured DRE is claimed for the abatement device. SIA member companies have installed HC fuel CECS for which they choose to not claim DRE under the current rule. The additional complexity of apportioning RPC NF_3 and F_2 to both <0.1% certified and uncertified HC fuel CECS will require time and cost investments, which are not justified by data. SIA requests the definition of hydrocarbon-fuel-based combustion emission control systems is tailored to include POU HC fuel CECS only and include the following language: "...and have the potential to emit fluorinated greenhouse gases"

If HC fuel CECS abatement suppliers and device manufacturers are not able to provide the required certification to exempt systems from this added emission, for every kilogram of RPC NF_3 used, CO_2e emissions out of the HC fuel CECS will increase more than 600% for 200 mm and more than 400% for 300 mm. This jump in CF_4 emissions will result in a time series inconsistency for semiconductor industry greenhouse gas reporting, based on data that is not peer reviewed, are based on assumptions, and appear to be based on emissions measurement values that did not use industry standards or the EPA DRE testing protocols.

Additionally, if EPA maintains this requirement, it is unclear if Equation I–9 applies in addition to or in place of existing CF_4 byproduct emission factors. SIA requests CF_4 emissions from the HC fuel CECS abatement of F_2, as calculated by Equation I–9, are applied instead of, not in addition to, default CF_4 BEF's for RPC NF_3.

SIA strongly requests the removal of Equation I–9 and associated $AB_{CF4,F2}$ and $B_{F2,NF3}$ data elements. However, in the alternative, SIA requests changes to hydrocarbon-fuel-based

combustion emissions control systems (HC fuel CECS) requirements to remove confusion and double counting of emissions.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 9

Comment Excerpt: We share concerns of the following language in the proposed rule:

"A hydrocarbon-fuel-based emissions control system is assumed not to form CF_4 from F_2 if the electronics manufacturer can certify that the rate of conversion from F_2 to CF_4 is <0.1% for that hydrocarbon-fuel based emission control system."

This proposed change is not supported by peer reviewed data collected under semiconductor manufacturing conditions. Further the data used as the basis for the very large byproduct emission factor (BEF) proposed by EPA was submitted as confidential business information (CBI) by one abatement vendor used within the industry. This condition as proposed conflicts with any abatement that has a certified DRE for CF_4 as they are not mutually exclusive. As written, the proposed provision penalizes facilities that install emission control equipment because the emissions from uncertified POU would be equivalent to those that are unabated. This artificial increase in CF_4 emissions would also negatively impact the time series continuity in the emission trends over time. EPA has documented in the preamble that the current testing methods cited in the MRR as required for use to verify abatement performance may be difficult to implement for F_2 and thus it may not be feasible for any vendor to certify that they do not generate this BEF. Intel agrees with SIA comments that this proposed change should not be promulgated, at least until peer reviewed data that employs industry-wide test methods is available. EPA's reliance on confidential data submitted by one abatement vendor prevents Intel from meaningfully commenting.

Adverse Impact: This proposed requirement (i) would introduce an artificial byproduct that increases emissions significantly and disincentivizes the use of low emission NF_3 cleans or abatement for the second highest known GWP chemical of NF_3 and (ii) could also slow implementation of processes with F_2 (0 GWP potential) that would drive lower overall emissions due to the artificial requirement to report CF_4 BEF generation with tools with point of use abatement.

The commenter identified in a table the proposed requirements at 98.94(e), 98.96(o), 98.97(b), and New Equation I–9 for removal.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 29

Comment Excerpt: SIA supports using the term "hydrocarbon-fuel-based combustion emissions control systems" (HC fuel CECS) which aligns with the nomenclature within 2019 IPCC rather than the less used "hydrocarbon-fueled abatement systems" or other terms. SIA requests that all emissions control systems language is updated to be consistent. SIA believes the broad definition of HC fuel CECS maybe interpreted to include all hydrocarbon-based fuel control systems, not just tool-level POU abatement. Semiconductor facilities widely implement large, facility-level volatile organic compound abatement devices to eliminate and control criteria volatile and non-volatile organic compounds, with no expectation of fluorinated greenhouse gas emissions. Additionally, although not currently implemented, future facility-level F-GHG abatement systems could be incorrectly included in the scope of Equation I–9 as it is written. SIA requests the definition of hydrocarbon-fuel-based combustion emission control systems is tailored to specify hydrocarbon-fuel-based combustion emissions control systems (HC fuel CECS) connected to manufacturing tools. SIA also requests to include the following language: "and have the potential to emit fluorinated greenhouse gases"

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 12

Comment Excerpt: The Agency further explains in the preamble their intent to "...require that the uptime... during stack testing period average at least 90% for uncertified hydrocarbon-fueled emissions control system." Uptime tracking for uncertified abatement devices is excessive, an expansion beyond the IPCC 2019 refinement requirements which puts U.S. fabs at a disadvantage in using a stack test method and does not improve the accuracy of emissions estimates.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 17

Comment Excerpt: SIA requests EPA specify that HC fuel CECS uptime during stack testing is "representative of the emissions stream." SIA requests EPA specify that HC fuel CECS uptime during stack testing applies to NF_3 remote plasma clean or input F_2 processes only. EPA is proposing to require within stack testing that all HC fuel CECS "that are not certified not to form CF_4 must operate with at least 90% uptime during the test." SIA requests language to limit this requirement to "at least 90% uptime of NF_3 remote plasma clean HC fuel CECS devices that are not certified to not form CF_4 during the test."

It is unclear if Equation I–9 applies in addition to stack testing requirements. SIA requests that CF_4 emissions from the HC fuel CECS abatement of F_2, as calculated by Equation I–9, is specifically exempted from the stack testing method as it would double count CF_4 emissions.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 24

Comment Excerpt: SIA would also like to provide brief comment in response to EPA's request within the preamble for feedback:

"required to measure the rate of conversion from F_2 to CF_4 using a scientifically sound, industry-accepted method that accounts for dilution through the abatement device, such as the EPA DRE Protocol, adjusted to calculate the rate of conversion from F_2 to CF_4 rather than the DRE. The EPA requests comment on whether there are other measurement methods that should be cited as examples or listed as options for this measurement... The EPA requests comment on this and any other issues that may arise in adapting the EPA DRE Protocol to measure the rate of conversion from F_2 to CF_4 in hydrocarbon-fuel-based emissions control systems. These issues and means of handling them could then be specifically addressed in the final rule."

SIA is currently unaware of other testing methodologies that are accurate and feasible for the purposes of testing F_2 and CF_4 simultaneously at the semiconductor manufacturing tool and POU abatement device.

Response: The EPA acknowledges the commenters' input on this issue.

9.8 Comments on proposed calibration requirements for abatement systems

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 1

Comment Excerpt: In the Proposed Revisions to Improve the Quality of Data Collected for Subpart I, Revisions to calibration requirements for abatement systems, EPA requires:

"The site maintenance plan for abatement systems must include a defined preventative maintenance process and checklist. Preventative maintenance must include, but is not limited to, calibration of pump purge flow indicators. Pump purge flow indicators must be calibrated each time a vacuum pump is serviced or exchanged."

The preamble goes on to indicate this proposed change would: ".....require calibrations every 1 to 6 months, depending on the process."

This proposal would have significant impacts to the U.S. semiconductor industry and will drive a major increase in pump replacement and tool downtime. Point-of-use (POU) abatement devices and their connected vacuum pumps are separate systems. While physically connected, POU maintenance activities and pump replacement schedules are independent of one another. Of particular importance, vacuum pumps are directly in-line with semiconductor processing tools and chambers and therefore must meet strict semiconductor manufacturing particle requirements for quality control to prevent product defects.

Based on discussions with pump manufacturers and SIA device manufacturers, pump purge flow calibration is technically and operationally infeasible for the device manufacturers to perform. Please note that the following statements represent standard practice as per SIA commenting members. The purge flow indicators are factory calibrated and are part of the pump installation and commissioning. If there is a flow indicator failure, the vacuum pump is replaced with a factory-calibrated pump. Pump maintenance and repair is not typically performed at the manufacturing tool and requires pump disconnection and physical removal, and therefore are often repaired off-site.

Pump manufacturers do not provide recommendations or specifications for re-calibration of these pumps because it is performed at the pump manufacturer's facility. There is no pump redundancy installed on a tool nor is it standard within the semiconductor industry. To check the calibration and potentially replace the flow transducer, the vacuum pump must be shutdown to safely work on it. Any replacement of the pump would require a tool shutdown for safe pump replacement and therefore 12 to 48 hours of downtime for manufacturing requalification, as strict

fab particle contamination requirements must be met upon restart of the pump. In many cases, the pump cannot be expected to immediately restart after reconnection to tool due to condensation of process byproduct.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 2

Comment Excerpt: Based on feedback from members of SIA via an August 2022 survey, semiconductor manufacturing sites can have 2,000+ POU abatement devices as well as 4,000+ vacuum pumps in a high-volume-manufacturing (HVM) site. Future semiconductor fabs will primarily be HVM sites and will also be impacted by these proposed changes. Pumps remain continually in service on the order of years, rather than months. Although EPA estimates pump purge calibrations every 1 to 6 months, pump vendors indicate that pumps can remain in service for many years without requiring calibration of the pump purge.

A pump change/refurbishment costs over $5000 per occurrence. Hiring trained personnel to perform these tasks would be operationally infeasible due to the sheer number of pumps. Process pump repair or calibration activities can require significant coordination with factory and site operations because equipment and technician resources are highly specialized. The number of staged pumps that would be required is prohibitive due to limited storage space.

SIA estimates that such increased pump downtime, process equipment tool downtime, and maintenance could cost the U.S. semiconductor industry annually about $40 million USD[3] in labor and equipment costs and significantly more cost in tool down time and other processing costs, not including impact to revenue which will lead to even greater cost impacts.

Footnotes

[3] The cost of pump change-out is approximately $5000 per pump (according to feedback from one pump vendor). The number of additional pump change-outs required for the U.S. industry per year is more than 8000 (based on SIA survey of members August 2022, the value is closer to 12,000). $5000 per pump x 8000 additional pump changeouts per year = $ 40 million per year.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)

Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 3

Comment Excerpt: SIA believes existing performance certification of POU emissions control devices based on high flow conditions are highly protective of POU system reliability. High flow POU certification is based on maximum device flows. For multi-chamber tools, this high flow certification includes all chambers running at once. Significant variations in pump purge flows are unlikely and the magnitude of these variations would be a small component of overall POU flow volumes. Therefore, pump purge flows are not necessary to calibrate after initial pump commissioning to ensure accurate POU performance.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 4

Comment Excerpt: SIA requests EPA remove proposed pump purge flow certification requirements because there is no impact on POU system performance and emissions estimate accuracy; moreover, the proposed changes would drive significant industry cost (in the tens of millions of dollars) as well as detrimental impacts to production tool uptime and go above and beyond 2019 IPCC.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Intel Corporation
Commenter Affiliation:
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0299-A1
Comment Excerpt Number: 7

Comment Excerpt: We share concerns regarding the following language in the proposed rule:

"Preventative maintenance must include, but is not limited to, calibration of pump purge flow indicators. Pump purge flow indicators must be calibrated each time a vacuum pump is serviced or exchanged."

EPA proposes that the pump purge flow indicator calibration must occur with every vacuum pump service activity and further hypothesizes that pump service routinely occurs ~every 1-6 months or that they could require the calibration 1-2 time per year. This proposed requirement goes beyond the requirements from vacuum pump vendors who complete this calibration each time a pump is exchanged. The pumps are designed to be in-service and operating within manufacturer specification for multiple years and it is not feasible to calibrate the flow indicator non-invasively without significant impacts to manufacturing. Intel respectfully submits that manufacturers do not require this pump purge flow indicator calibration as part of routine pump maintenance and therefore EPA's proposal is unwarranted, especially in the absence of technical data justifying the significant impact to manufacturing operations.

Adverse Impact: If this proposed calibration were required only one time per year for the [REDACTED AS CONFIDENTIAL BUSINESS INFORMATION] pumps in a fab, it would result in a [REDACTED AS CONFIDENTIAL BUSINESS INFORMATION] per fab annual expense which accounts for the expense of a pump exchange and tool downtime of 12+ hours per pump calibration.

Response: See section III.G.2 of the preamble to the final rule for the EPA's response to this comment.

10.0 Comments on Subpart N of Part 98

Commenter Name: Angus E. Crane
Commenter Affiliation: North American Insulation Manufacturers Association (NAIMA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0215-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA's request for additional data elements, such as those related to the use of recycled glass, also are afforded confidentiality determinations. Therefore, NAIMA supports the improvements and broadening of confidentiality determinations. NAIMA and its members appreciate EPA's effort to protect confidential and sensitive business information that if divulged would compromise production and trade secrets.

Response: EPA acknowledges the commenter's support of the proposed data elements and confidentiality determinations.

11.0 Comments on Subpart P of Part 98

11.1 General Comments on Revisions to Subpart P

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 85

Comment Excerpt: EPA should develop methods for estimating, detecting, quantifying, and reporting hydrogen emissions from leakage, venting, and purging. Developing these methods is important even in the absence of mandated reporting—it can aid in industry- and government-led lifecycle accounting efforts, offering greater flexibility and degrees of comprehensiveness. It is also important for implementing EPA's authority under section 103 of the Clean Air Act. [Section 60105 of the Inflation Reduction Act contains appropriations that could be used for these purposes. See Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 60105, https://www.congress.gov/117/bills/hr5376/BILLS-117hr5376enr.pdf.] As detection technologies progress alongside our understanding of hydrogen's climate impacts, EPA should evaluate including hydrogen as a greenhouse gas subject to reporting. EPA should work with DOE and other relevant agencies to develop best practices and guidelines for hydrogen infrastructure buildout to minimize climate and safety risks associated with hydrogen production, storage, distribution, and use where it is used.

Response: The GHGRP currently requires reporting for the greenhouse gases and other fluorinated greenhouse gases defined in 40 CFR 98.6. The EPA did not propose or request comment on requirements to expand reporting for hydrogen as a greenhouse gas or for characterization of hydrogen emissions from leakage, venting and purging, and is not taking final action on such a request in this final rule. This comment is out of scope for this rulemaking.

11.2 Revisions to the source category definition

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 6

Comment Excerpt: We recommend that EPA consider expanding the source category to include all forms of hydrogen production facilities, including those producing hydrogen through electrolysis or other less common methods. Even if these facilities are emitting lower or no greenhouse gas emissions, it is important that EPA gather activity data and information on

energy consumption for this emerging sector to understand its impact on the overall energy mix and its role in decarbonization strategies.

EPA should consider amending this definition or clarifying through guidance or preamble text that it encompasses all forms of hydrogen production facilities, including those using electrolysis and any facility where emissions from hydrogen production are not reported through other categories. The existing definition may cause confusion in situations where the hydrogen produced is used onsite or otherwise not "sold as a product to other entities." While emissions from hydrogen production used onsite at refineries should be reported through that subpart, there may be uses beyond refining that would go unreported. We therefore recommend that EPA revise the definition as follows:

> (a) A hydrogen production source category consists of facilities that produce hydrogen gas as a product or a feedstock for other processes or products ~~sold as a product to other entities.~~
>
> (b) This source category ~~eemprises~~ includes but is not limited to process units that produce hydrogen by reforming, gasification, oxidation, reaction, electrolysis, or other transformations of feedstocks.
>
> (c) This source category includes ~~merehant~~ hydrogen production facilities located within another facility if emissions from hydrogen production are not reported by the larger facility under another subpart. ~~they are not owned by, or under the direct control of, the other facility's owner and operator.~~

By ensuring the source category adequately encompasses the various forms of hydrogen production that are likely to proliferate in coming years, EPA can ensure it is gathering the data to understand the climate and energy implications of this growing sector. Gathering emission data from hydrogen facilities that emit greenhouse gases and activity data from the sector more broadly will help EPA identify potential new emission sources and could inform future regulatory or non-regulatory approaches to minimize climate and air pollution impacts from hydrogen production. This information is also important for informing EPA's implementation of section 103 of the Clean Air Act regarding improvements in nonregulatory strategies and technologies for preventing or reducing air pollutants.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 7

Comment Excerpt: This source category should also encompass forms of production that use renewable energy as the primary input. Reporting on energy consumption, is necessary to inform decarbonization strategies. Green hydrogen may be important in hard-to-decarbonize sectors, like steel and shipping; however, the energy penalty makes direct electrification preferable for all end uses where electrification is possible. With every 1 kwh of renewable energy, using it to produce green hydrogen means only half of it (0.5 kwh) makes it into the produced hydrogen-the other half is lost through the process. And with limited renewable energy capacity, producing excessive amounts of green hydrogen may risk delaying fossil fuel retirement by diverting renewable energy from other uses. Understanding the electricity input for these forms of hydrogen production is central to evaluating their benefits. Additionally, were EPA to require reporting of emissions of hydrogen itself in future rulemakings, many of the producing facilities would already be subject to reporting requirements.

With these changes to the source category definition, our recommendations on energy consumption would trigger requirements to report data on energy purchases by green hydrogen facilities that use as much energy as comparable SMR plants. For example, in NREL's H2A Hydrogen Analysis Production Model, the modeled SMR plant without CCS emits 1,487,200 metric tons of CO_2 per year.[48] The same plant produces 158,673,384 kg of H2 in a year, using 25,031,837 MMBtu of gas. Of that gas, 16.5% (4,130,000 MMBtu) is used as fuel and the rest is used as feedstock, according to this analysis (Table 3, Base Case, Specific Consumption).[49] The plant also uses 20,786,213 kWh (70,900 MMBtu) of electricity in a year.[50] So the unit's total annual energy use is about 4,200,000 MMBtu.[51] Scaling that number down to the size of a facility that emits 25,000 metric tons of CO_2 in a year, which would trigger reporting under the current 40 C.F.R. § 98.2(a)(2), the energy input would be about 70,600 MMBtu. This is the value that would trigger reporting for green hydrogen production facilities under our recommended threshold described in section XI. Applying that threshold to a typical electrolysis plant, we estimate that most would be subject to our proposed reporting on energy consumption. An electrolysis plant uses about 55.5 kWh (0.189 MMBtu) of electricity to produce a kilogram of hydrogen, according to NREL's H2A Lite Model.[52] So an electrolysis plant that uses 70,600 MMBtu per year (the suggested threshold for reporting) would produce about 373,545 kg hydrogen per year, which is a relatively low output. [53] Our recommended threshold based on energy input is therefore likely to capture most green hydrogen plants.

Footnotes

[48] NREL, H2A: Hydrogen Analysis Production Models, https://www.nrel.gov/hydrogen/h2a-productionmodels.html.

[49] Collodi et al., Techno-economic Evaluation of Deploying CCS in SMR Based Merchant H2 Production with NG as Feedstock and Fuel, 114 Energy Procedia 2690, 2707, Table 3, Base Case, Specific Consumption (2017), https://www.sciencedirect.com/science/article/pii/S1876610217317277.

[50] Id.

[51] Id.

[52] NREL, supra note 48.

[53] See, *e.g.*, Johanna Ivy, Summary of Electrolytic Hydrogen Production, NREL/MP-560-36734 (2004), https://www.nrel.gov/docs/fy04osti/36734.pdf.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 7

Comment Excerpt: The existing definition unnecessarily limits reporting to only merchant hydrogen production facilities. While we believe data on any hydrogen produced as a direct- or by-product and sold is important, broadly gathering data from all hydrogen production facilities is also important. We urge EPA to ensure that data from process units excluded from the source category definition which is reported through other subparts is compiled in a way that allows it to be analyzed as part of the hydrogen production category.

Response: We agree with the commenter that subpart P should be applicable to non-merchant facilities and are finalizing the proposed revisions. See section III.I.2 of the preamble to the final rule for the EPA's response to this comment. While hydrogen production may be used in the production of other chemicals, such as in the ammonia production process, we are not requiring separate tracking and reporting of the GHG emissions from only the hydrogen production step of those processes. We consider the data as reported under subpart G and other similar subparts to be sufficient to understand the GHG impacts of these hydrogen production processes at this time.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 8

Comment Excerpt: The Industry Trades support the exemption to the source category in 40 CFR 98.160(b)(1)(B) clearly excluding catalytic reforming units covered under Subpart Y from reporting in Subpart P.

Response: The EPA acknowledges the commenter’s support for the proposed revisions.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association

Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 9

Comment Excerpt: The Industry Trades do not support amending the source category requiring reporters to report combustion from hydrogen production process units under Subpart P in lieu of Subpart C as proposed in 40 CFR 98.160(c). These units may not be metered separately from other combustion units located at an integrated facility such as a refinery with a hydrogen production unit; therefore, we recommend reporting stationary combustion emissions from hydrogen production under Subpart C. If those emissions have to be reported under Subpart P instead of Subpart C, EPA shall allow engineering estimation for fuel consumption to avoid burdensome retrofitting of fuel meters.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Leslie Bellas
Commenter Affiliation: American Fuels and Petrochemical Manufacturers (AFPM)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0323-A1
Comment Excerpt Number: 8

Comment Excerpt: Similar to our comments about coke calciners, AFPM does not oppose expanding reporting obligations to non-merchant hydrogen units. However, AFPM offers the following suggestion to ensure the hydrogen unit GHGRR obligations.

EPA proposes to amend the source category definition to clarify that stationary combustion sources that are part of a hydrogen production unit (*e.g.*, reforming furnace and hydrogen production process unit heater) are part of the hydrogen source category and GHG emissions should be reported under subpart P, regardless of how and where the emissions are exhausted.[25] However, if a facility has integrated units with common metering, the proposal, as written, requires additional metering to comply with subpart P reporting of hydrogen and furnace emissions. AFPM proposes that 40 CFR § 98.163 be revised to allow integrated facilities with common metering to provide an engineering estimate of emissions from the combustion furnace.

Footnotes

[25] 88 Fed. Reg. at 32,928 (see 40 CFR § 98.160(c)).

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0311-A1
Comment Excerpt Number: 5

Comment Excerpt: Hydrogen gas is used extensively within the semiconductor industry including in annealing processes, epitaxial and thin film deposition, plasma etch, chemical stabilization and point of use abatement. The industry's use is projected to grow through the anticipated growth of manufacturing and the adoption of extreme ultraviolet lithography. As H2 use grows, the need for a reliable and cost optimized source of hydrogen may drive some semiconductor manufacturers to install onsite hydrogen production plants.

EPA is proposing to amend the source category definition to clarify that stationary combustion sources that are part of the hydrogen production unit (*e.g.*, the reforming furnace and hydrogen production process unit heater) are part of the hydrogen production source category and that their emissions are to be reported under subpart P. We recommend that EPA implement a threshold to limit the applicability of the subpart to larger hydrogen production facilities.

The proposed changes for subpart P as written would pull in all manufacturers of hydrogen regardless of whether greenhouse gases are generated. In doing so this would trigger reporting by facilities for the newly proposed Subpart B and be overly burdensome.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

11.3 Revisions to calculation methods to allow subtraction of carbon from products other than CO_2 and methanol

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 42
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: EPA has proposed revisions to enable a net CO_2 reporting approach for the production of hydrogen to account for the carbon that is embedded in final products. We support this change as an improvement that allows for a better estimation of net CO_2.

Response: The EPA acknowledges the commenter's support for the proposed revisions. However, the EPA is not taking final action on the requirement to calculate and report net CO_2 process emissions at this time. See sections III.E, III.I, and III.K.2 of the preamble to the final rule for additional information.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 43
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: EPA's proposed mass balance equation under § 98.163(d), Equation P–4, requires further revision to ensure that it is accurate for refineries that have non-merchant hydrogen plants reportable under subpart Y. Because subpart Y references subpart P requirements for the calculation of CO_2 emissions, as in § 98.252(i), the following revisions to Equation P–4 must be made to ensure proper accounting within subpart Y.

The variable "$C_{offsite,n}$" should be further revised to include for non-merchant hydrogen plants as follows: "Mass of carbon other than CO_2 or methanol collected from the hydrogen production unit and transferred off site or reported elsewhere by the facility under this part, from company records for month n (metric tons carbon)."

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

11.4 Request for comment on removing subpart P thresholds and adjustments to "offramping"

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 10

Comment Excerpt: We strongly urge EPA to make subpart P an "all-in" subpart by removing the reporting threshold to ensure all hydrogen production facilities are covered by reporting requirements, including those proposed under subpart B. EPA has correctly identified the need for data from hydrogen production facilities that may have smaller direct emissions but use very large quantities of energy. For example, hydrogen electrolysis facilities may consume very large amounts of grid electricity that could have significant upstream emissions impacts.[14] Understanding this information will be critical to informing future actions under the Clean Air Act and other authorities to ensure hydrogen production is not driving upstream pollution. Likewise, any hydrogen production facilities using carbon capture and sequestration technology (CCS) should be required to report in all instances as emissions data and energy consumption data from these facilities will be highly relevant to future regulatory action and to inform policy around hydrogen production more broadly.

Footnotes

[14] Hydrogen produced using electricity from the current U.S. average grid has a carbon intensity of 21 kg of CO_2/kg H2, which is far higher than hydrogen produced through steam methane reformation (carbon intensity of between 8 and 12 kg of CO_2/kg H2). See Blank & Molly, Hydrogen Decarbonization Impact for Industry: Near-term challenges and long-term potential, RMI (2020), https://rmi.org/insight/hydrogens-decarbonization-impact-for-industry/#:~:text=Near%2Dterm%20challenges%20and%20long%2Dterm%20potential&text=When%20considering%20what%20a%20global,other%20viable%20pathways%20to%20decarbonization.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 12

Comment Excerpt: We support EPA in setting a production-based reporting threshold to ensure that reporting for large facilities with lower direct emissions does not cease after three to five years. In general, hydrogen production facilities—which will require significant upfront investments and may be heavily subsidized—are readily capable of reporting emissions and energy consumption data. EPA should set a production-based reporting threshold to capture at least the top 75% of commercial scale hydrogen production facilities. Given the importance of reported data from the emerging hydrogen production sector, EPA should not consider itself limited to setting a threshold that corresponds to the existing 25,000 mtCO_2e threshold. Instead, EPA should set a threshold that captures most commercial hydrogen production facilities. Based on our analysis of proposed hydrogen production projects and the existing policy landscape—including significant federal incentives—we believe a production capacity threshold to capture the top 75% of production facilities is appropriate.[15]

Footnotes

[15] EDF analysis based on data from Rystad HydrogenCube Browser shows that a production capacity threshold of 264 thousand tons per year would capture the top 75% of planned, under construction, and currently operating facilities.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Elizabeth Ravestijn
Commenter Affiliation: Air Products and Chemicals, Inc.
Commenter Type: Industry

Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0310-A1
Comment Excerpt Number: 9

Comment Excerpt: Air Products supports the proposed updates to reporting thresholds to ensure that captive hydrogen plants not reporting under existing Subparts P, Y, etc. as well as other lower-emitting processes such as electrolysis, are explicitly included in the hydrogen plant definition to facilitate reporting under Subpart P. To avoid burdensome reporting requirements, we propose a hydrogen production threshold for applicability of 5,000 MT/year. This threshold avoids inclusion of some of the known, smaller site-based units that operate unmanned.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0311-A1
Comment Excerpt Number: 10

Comment Excerpt: We recommend EPA retain the existing threshold of 25,000 mtCO_2e versus implementing a new threshold tied to mass of hydrogen production to further incentivize the implementation of low GHG hydrogen manufacturing processes over those which traditionally generate higher GHG emissions such as steam methane reformers.

We disagree with increasing the complexity of the reporting rule by creating a new framework within Subpart P which makes it impossible to stop reporting and thus be “always in” for reporting to Subpart B.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 48

Comment Excerpt: EPA is seeking comment as to how to determine when or how a source will trigger or cease to report under Subpart P. EPA is proposing to use hydrogen production rates as the trigger for GHG reporting, instead of direct GHG emissions. EPA believes this approach will

capture hydrogen production units which use energy (rather than fossil fuel combustion). The Industry Trades believe that these types of units will frequently be part of a larger operation already subject to GHG reporting, and energy consumption will be captured under Subpart B. The Industry Trades offer the following recommendations on the provisions to cease reporting:

> i) Hydrogen production process units which produce hydrogen but emit no direct GHG emissions should become eligible to cease reporting starting January 1 of the following year after the cessation of direct GHG emitting activities associated with the process;
>
> ii) If the direct GHG emissions remain below 15,000 MT CO_2e or between 15,000 and 25,000 MT CO_2e, the Industry Trades recommend that reporting would be required for 3 or 5 years respectively, aligned with the existing Part 98 reporting off-ramp provisions; or
>
> iii) If EPA establishes a hydrogen production threshold for reporting, then the Industry Trades recommend that falling below that production threshold should be the trigger for cessation of reporting, either starting January 1 of the following year or on a parallel structure to the 3- and 5-year off-ramp emission thresholds.

The Industry Trades recommend that if the hydrogen production unit continues to combust fuel or is part of a larger process with multiple (or comingled) combustion units, those emissions will continue to be reported under Subpart C, consistent with the Industry Trades' recommendation above. Similarly, if the process unit is part of a refinery, any non-combustion energy consumption related to the process unit will be captured under proposed Subpart B.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 12

Comment Excerpt: EPA is also proposing to remove the "off-ramp" for facilities that otherwise could stop reporting (if annual emissions were under 15,000 after three years or between 15,000 and 25,000 after five years).[37] Again, EPA does not provide any justification for the proposed removal of this "offramp." In addition, EPA ignores that this "off-ramp" is intended for entities that should no longer be subject to reporting requirements under the rule by virtue of the fact that their emissions fall below a reasonable threshold. It is unclear how EPA would have authority to continue to require reporting for these entities, and, as discussed above, EPA's interest in upstream emissions related to hydrogen production is not sufficient to overcome a lack of regulatory authority justifying the collection of such data. See 88 Fed. Reg. at 32,876 (noting that upstream emissions could be greater than direct emissions for hydrogen produced via

electrolysis).[38] If EPA plans to move forward with a proposal along these lines, it should provide justification for its proposal and a proposed rule on which interested parties may comment.

Footnotes

[37] See id. at 32,876.

[38] EPA could propose a separate standard addressing emissions from hydrogen production under CAA 111. This would be more appropriate than attempting data collection fishing expeditions. If EPA needed to data to develop such standards, the Agency has other tools, outside of the GHGRP, to collect it. Moreover, EPA already has proposed to require EGUs to limit their use of hydrogen to "low GHG hydrogen" for purposes of compliance with the Proposed Section 111 Rules.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 14

Comment Excerpt: EPA is also proposing to remove the "off-ramp" for facilities that otherwise could stop reporting (if annual emissions were under 15,000 after three years or between 15,000 and 25,000 after five years).[26] Again, EPA does not provide any justification for the proposed removal of this "off-ramp." EPA ignores that this "off-ramp" is intended for entities that should no longer be subject to reporting requirements under the rule by virtue of the fact that their emissions fall below a reasonable threshold. It is not clear how EPA would have the authority to continue to require reporting for these entities, and EPA's interest in upstream emissions related to hydrogen production is not sufficient to overcome a lack of regulatory authority justifying the collection of such data.[27] If EPA plans to move forward with a proposal along these lines, it should provide justification for its proposal and a proposed rule on which interested parties may provide comment.

Footnotes

[26] See id. at 32,876.

[27] EPA could propose a separate standard addressing emissions from hydrogen production under CAA 111. This would be more appropriate than attempting data collection fishing expeditions. If EPA needed to data to develop such standards, the Agency has other tools, outside of the GHGRP, to collect it. Moreover, EPA already has proposed to require EGUs to limit their use of hydrogen to "low GHG hydrogen" for purposes of compliance with the Proposed Section 111 Rules.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Elizabeth Ravestijn
Commenter Affiliation: Air Products and Chemicals, Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0310-A1
Comment Excerpt Number: 10

Comment Excerpt: We also propose allowance for permanent use of BAMM data to determine CO_2e emissions for some of these new production unit inclusions (*e.g.*, captive plants, electrolysis) since they have admittedly low, or possibly non-existent, CO_2e emissions which may present difficulties in complying with prescribed methodologies and/or accuracy requirements. We feel an appropriate threshold below which to allow use of BAMM would be 25,000 MT CO_2e based on the current emissions-based reporting threshold.

Response: The EPA is not finalizing any revisions to the threshold to subpart P, therefore, facilities with hydrogen production plants will continue to determine applicability to part 98 based on the existing requirements of 40 CFR 98.2(a). A facility that contains a source category listed in Table A–4 to subpart A of part 98 (which includes hydrogen production) must report only if the estimated combined annual emissions from stationary fuel combustion units, miscellaneous uses of carbonate, and all applicable source categories in Tables A–3 and Table A–4 of part 98 are 25,000 metric tons carbon dioxide equivalents ($mtCO_2e$) or more Therefore, there are no changes to the monitoring requirements as a result of this comment.

11.5 Revisions to recordkeeping and reporting requirements (40 CFR 98.166 and 98.167)

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 6

Comment Excerpt: Standards that address hydrogen production, infrastructure, and end-uses will be critical to ensure hydrogen delivers the intended climate benefits. Data gathered by EPA through the GHGRP can help inform these efforts. We therefore support EPA's proposed expansion of and improvements to subpart P reporting.

Response: The EPA acknowledges the commenter's support for the proposed revisions. However, the EPA is not taking final action on the proposed expansion of the source category definition at this time, with the exception of requiring all captive plants above the current 25,000 metric tons carbon dioxide equivalents ($mtCO_2e$) threshold to begin reporting under subpart P. Additionally, the EPA is not taking final action on requiring reporting the quantity of hydrogen provided to each end-user (including both onsite use and delivered hydrogen) at this time.

Commenter Name: Elizabeth Ravestijn
Commenter Affiliation: Air Products and Chemicals, Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0310-A1
Comment Excerpt Number: 5

Comment Excerpt: Air Products supports the separate reporting of hydrogen that is produced (by reforming, gasification, oxidation, reaction, or other transformations of feedstocks) and hydrogen that is present in accepted off-gas or syngas that is only purified (via PSA, amine adsorption, membrane separation, other) for a given hydrogen production facility. Air Products requests that EPA provide sufficient implementation time and allow for Best Available Monitoring Methods (BAMM) to be utilized until, at a minimum, the next scheduled turnaround when installation of necessary monitoring equipment could occur.

Response: See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Elizabeth Ravestijn
Commenter Affiliation: Air Products and Chemicals, Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0310-A1
Comment Excerpt Number: 8

Comment Excerpt: The proposal includes a requirement for facilities to report the "process type" for each hydrogen production unit (*i.e.*, SMR, SMR–WGS, POX, POX–WGS, Water Electrolysis, Brine Electrolysis, or Other (specify) (§ 98.166(b)(ii)). We support EPA's proposal that there be an option for the reporter to select "Other" and disclose a technology that does not necessarily fit into one of the other categories.

Response: We appreciate the support of the proposed requirements to report "process type" and the inclusion of "other (specify)" as a process type. We have revised the final rule to include "autothermal reforming only" and "autothermal reforming followed by WGS" as additional process types.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 8

Comment Excerpt: We support EPA's proposal to require reporting on process type from each unit as well as clarifying reporting on the quantity of hydrogen produced and purified by each unit. This data will provide EPA with valuable insights on the amount of hydrogen being produced through different processes, which will be critical for understanding emissions and energy impacts as well as informing future actions under the Clean Air Act. The amount of hydrogen produced and sold at the unit level from facilities is important in addition to the emissions from production to understand the carbon intensity of hydrogen and for ensuring compliance with other regulations and requirements.

Response: We appreciate the support of the proposed requirements to report "process type" and the inclusion of "other (specify)" as a process type.

Commenter Name: Elizabeth Ravestijn
Commenter Affiliation: Air Products and Chemicals, Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0310-A1
Comment Excerpt Number: 6

Comment Excerpt: The proposal requires reporting of the annual net quantity of steam consumed by each hydrogen production unit which, per EPA, would be a positive quantity if the hydrogen production unit is a net steam user (*i.e.*, uses more steam than it produces) and a negative quantity if the hydrogen production unit is a net steam producer (*i.e.*, produces more steam than it uses) (§ 98.166(b)(9)). Air Products supports the reporting of annual net steam consumed by each hydrogen production unit. There may be situations where steam is sourced from equipment (*e.g.*, a stand-alone boiler) distinct from a waste heat boiler associated with the Steam Methane Reforming (SMR) process. The proposal needs to allow for this distinction and include flexibility in how the steam production and consumption is measured and quantified – including the ability to utilize BAMM.

Response: Based on our consideration of all of the comments received on the proposed requirement to report the quantity of hydrogen by each end-user, EPA is not taking any final action on this revision in this rule. We intend to continue to assess various potential end-user reporting requirements and, if appropriate, propose requirements in future rulemaking(s).

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 10

Comment Excerpt: The Industry Trades are also concerned that reporting the net quantity of steam consumed as proposed under 40 CFR 98.166(b)(9) could result in duplicative reporting based on what is proposed to be reported under Subpart B (*i.e.*, where steam is provided by a third-party supplier). The Industry Trades respectfully request removal of this requirement from Subpart P.

Response: See response to comment EPA-HQ-OAR-2019-0424-0310-A1, Excerpt 6.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 11

Comment Excerpt: EPA is proposing to require reporting of the annual net quantity of steam consumed per unit.[36] However, the Agency does not provide rationale for this proposal or indicate how it would use this information in its calculations. EPA should provide its justification for this proposal and clarify how the information would be used. To ensure that there is adequate opportunity for notice and comment on this proposal, it may be necessary for EPA to issue an additional supplemental notice of proposed rulemaking to take comment on any such justification.

Footnotes

[36] See id. at 32,875.

Response: See response to comment EPA-HQ-OAR-2019-0424-0310-A1, Excerpt 6.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 13

Comment Excerpt: EPA is proposing to require reporting of the annual net quantity of steam consumed per unit. However, the Agency does not provide its rationale for this proposal or indicate how it would use this information in its calculations. EPA should provide its justification for this proposal and clarify how the information would be used. To ensure that there is adequate opportunity for notice and comment on this proposal, it may be necessary for EPA to issue an additional supplemental notice of proposed rulemaking to take comment on any such justification.

Response: See response to comment EPA-HQ-OAR-2019-0424-0310-A1, Excerpt 6.

Commenter Name: Leslie Bellas
Commenter Affiliation: American Fuels and Petrochemical Manufacturers (AFPM)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0323-A1
Comment Excerpt Number: 9

Comment Excerpt: AFPM members also request that reporting obligations for hydrogen production units align with obligations for other source categories. Specifically, similar to other source categories,[26] the following information should be reported only when a CEMs is not used to report emissions:

- the quantities of hydrogen exiting the hydrogen production unit (40 CFR § 98.166(b)(3)).
- the annual quantity of ammonia intentionally produced as a desired product (40 CFR § 98.166(b)(4)).
- the name and annual quantity of each carbon-containing fuel and feedstock (40 CFR § 98.166(b)(5)); and
- the annual quantity of methanol intentionally produced as a desired product (40 CFR § 98.166(b)(8)).

Unless EPA can articulate a good reason for dissimilar treatment from these other source categories, EPA should delete 40 CFR §§ 98.166((b)(3)-(5) and (8). AFPM would support a revision to subpart P that would require facilities to retain this information.

AFPM also objects to EPA's effort to obtain non-emissions operational and efficiency data. EPA offers no policy justification for requiring hydrogen production units to report the quantity of CO_2 and the annual quantity of carbon other than CO_2 or methanol collected and transferred offsite (40 CFR §§ 98.166(b)(6) and (7), and annual quantity of steam consumed by the unit (40 CFR §§ 98.166(b)(9)). This is not emissions-related data, which is the subject of the GHGRR, and EPA has not demonstrated any practical utility for collecting this information.[27]

Footnotes

[26] See *e.g.*, 40 CFR §§ 98.76-77, §§ 98.86-87, §§ 98.196-197, and §§ 98.256(f)(6) and 257(b)(28)-(b)(31).
[27] 5 CFR Part 1320.3(l).

Response: The annual quantity of hydrogen exiting the hydrogen production unit and the annual quantity of ammonia intentionally produced as a desired production are currently required to be reported for each hydrogen production process unit using a CEMS to calculate emissions; see § 98.166(a)(2) and (a)(3). The EPA did not propose to require reporting the name and annual

quantity of each carbon-containing fuel and feedstock for hydrogen production process units using a CEMS to calculate emissions. The referenced proposed citation, § 98.166(b)(5), starts with "If a material balance method is used." The material balance method, as specified in § 98.163(b) is one of two methods allowed to calculate emissions, with the other being the CEMS method. The annual quantity of methanol intentionally produced is currently required to be reported for the hydrogen production facility; see § 98.166(e). The proposed revision was to require reporting on a unit-level basis and we do not interpret this comment to address that proposed revision. Similarly, the quantity of CO_2 and the annual quantity of carbon other than CO_2 or methanol collected and transferred offsite is currently required to be reported for the production facility, see § 98.166(c) and (d). The proposed revision was to require reporting on a unit-level basis and we do not interpret this comment to address that proposed revision. Please refer to section III.I of the preamble to the final rule for the final revisions and supporting basis related to the provisions discussed in this comment. As discussed in sections II and III.I of the preamble to the final rule, we disagree that such information is not relevant to the purposes of the GHGRP and maintain that these revisions are consistent with similar existing requirements of the GHGRP, and more specifically here disagree that the reporting elements that help to characterize and verify the reported data are not needed for units that use CEMS. The rationale for the proposed requirements was also discussed in section III.G of the 2023 Supplemental Proposal (88 FR 32852). The reporting requirements listed by the commenter are used to help verify the reported data.

For additional information on how EPA provided information on the practical utility of the data proposed to be collected, see response to comment EPA-HQ-OAR-2019-0424-0244-A1, Excerpt 3 in section 33.0 of this document.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 15

Comment Excerpt: We strongly support EPA requiring reporting on the quantity of hydrogen provided to each end-user, including onsite use and delivered hydrogen. This data will help EPA and stakeholders understand the sources of hydrogen demand and use, which is directly relevant to EPA's efforts to reduce pollution caused by hydrogen production and use under the Clean Air Act. For example, this data could show that utilities are purchasing significant quantities of hydrogen for co-firing in natural gas power plants. This information would be relevant to EPA regulatory efforts to reduce emissions from natural gas power plants (both greenhouse gases and conventional air pollutants) and to regulatory efforts to reduce pollution from hydrogen production. As hydrogen demand grows and hydrogen uses diversify, it will be important to EPA and other stakeholders to have data to understand emerging trends and the potential air pollution impacts. We anticipate reporting burdens for supplying this information will be minimal as

hydrogen producers will have such information readily accessible as part of their normal business operations.

Response: The EPA acknowledges the commenter's support for the proposed revisions. However, the EPA is not taking final action on requiring reporting the quantity of hydrogen provided to each end-user (including both onsite use and delivered hydrogen) at this time. See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 9

Comment Excerpt: We urge EPA to require reporting of produced hydrogen that is sent to control devices, vented, or otherwise not delivered to end users. These hydrogen releases, which can entail substantial volumes, create meaningful climate impacts as well as safety risks.[13] Impure hydrogen that is not saleable may be flared by producers, and flaring may also occur in the absence of demand and adequate storage.

We also support EPA's proposal to require reporting at the unit level of CO_2 that is collected and transferred offsite. This will help EPA track the capture and transportation of CO_2 that may occur from any "blue" hydrogen facilities.

Footnotes

[13] Frazer-Nash estimate values from purging and venting in 2050 of 0.25%-0.50% of blue hydrogen produced and 0.24%-9.2% of green hydrogen produced. Frazer-Nash Consultancy, Fugitive Hydrogen Emissions in a Future Hydrogen Economy (March 2022), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1067137/fugitive-hydrogen-emissions-future-hydrogen-economy.pdf.

Response: We did not propose to or request comment on requiring reporting of vented or flared hydrogen and are not taking final action on such requirements in this final rule. We are also not taking final action on the proposed end-user reporting requirement at this time. We may consider this comment as we evaluate other potential revisions to subpart P, which for reporting of vented or flared hydrogen would be proposed in a future rulemaking to allow proper notice and comment process. We appreciate the support of the CO_2 collected and sent offsite and are finalizing that provision as proposed.

Commenter Name: Elizabeth Ravestijn
Commenter Affiliation: Air Products and Chemicals, Inc.
Commenter Type: Industry

Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0310-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA proposes Subpart P to require reporting of the quantity of hydrogen provided to each end-user (including both on-site use and delivered hydrogen). The justification for this additional reporting asserting in the notice is that "because hydrogen production can be GHG intensive," and knowing the end use and users is important. There is no improvement to emission quantification from capturing this additional data which is the focus of the GHG reporting program. The intensity of the production is currently captured under Subpart P and as demand for lower carbon hydrogen increases, EPA will collect the necessary data to show that the average emission intensity reported decreases regardless of what entity is using the hydrogen downstream. This program should remain focused on quantifying emissions from the industrial sector and collection of additional information on downstream use does not enhance or supplement emission quantification in any way.

Response: The EPA is not taking final action at this time on the requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Elizabeth Ravestijn
Commenter Affiliation: Air Products and Chemicals, Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0310-A1
Comment Excerpt Number: 3

Comment Excerpt: This proposal is administratively complex and burdensome. This reporting depends on a number of product transfer mechanisms and accounting systems (*e.g.*, pipeline systems, non-bulk sales, truck delivery) that will have to be accessed by individual reporters in various geographic regions across the company. It is even more complicated when data needs to be compiled for individual truck loads to distinct customers as the mobility sector grows. Establishing these data collection and quality assurance systems could take multiple years to ensure that all data pulled for product transactions is sufficient and accurate for compliance reporting. Additionally, having to include the GHG ID for the end user adds to this burden and creates compliance risk because we would have to rely on the end user to provide this number and do so accurately. The benefit of data collection does not justify the burden of collection.

Air Products recommends that EPA remove this reporting requirement. If reporting is maintained, we suggest it be limited to only bulk transfers consistent with EPA's alternative proposal and that providing the GHG ID for the end-user is optional.

Response: The EPA is not taking final action at this time on the requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0311-A1
Comment Excerpt Number: 9

Comment Excerpt: We further encourage EPA to not implement the requirement for submitting the sales and internal uses of hydrogen generated onsite but also ensure that EPA specifically includes exemptions from tracking downstream use where the end customer is not known per the example cited in the preamble.

Response: The EPA is not taking final action at this time on the requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Patrick Serfass
Commenter Affiliation: American Biogas Council (ABC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0313-A1
Comment Excerpt Number: 6

Comment Excerpt: Regarding Subpart B [sic], hydrogen production, the ABC notes that the consideration given by the EPA to requiring hydrogen production facilities to report the quantity of hydrogen provided to each end-user (including both onsite use and delivered hydrogen) and, if the end-user reports to GHGRP, the GHGRP ID for that customer may be inappropriate. Though the EPA says that this policy would help the Agency understand the demand and scope of end-uses of hydrogen, it risks exposing confidential business practices and undermining proprietary research and development activities.

Response: The EPA is not taking final action at this time on the requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 15

Comment Excerpt: EPA is seeking input on requiring sales information for hydrogen production. There are several reasons the Industry Trades believe this should not be required unless proposed through a separate rulemaking process.

It is important to note that the hydrogen market is in its very early stages, and it is unknown how hydrogen for energy consumption may evolve in the near or longer term. Codifying this in the regulation will require a full regulatory rulemaking process to address changing market conditions. As this market is evolving, it is possible this proposed new GHGRP requirement will become overly burdensome without providing useful information.

It is not clear how this information would be used by EPA; information necessary to determine emissions intensity is already provided in Subpart P.

The Industry Trades recommend limiting the reporting requirement to include only bulk hydrogen sales quantities, without specifying individual buyers identities and sales quantities. If reporting sales information is required, the Industry Trades recommend reporting at corporate level, rather than individual transactions, and that a cut-off threshold for reporting be established, similar to Subpart NN.

Response: The EPA is not taking final action at this time on the requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 13

Comment Excerpt: EPA proposes to collect sales information.[39] EPA similarly does not provide justification for this proposal.

Footnotes

[39] See id. at 32,876.

Response: The EPA is not taking final action at this time on the requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 13

Comment Excerpt: We support EPA's proposed addition of subpart B (as described earlier in these comments), and here, provide additional recommendations specific to the reporting of energy consumption from hydrogen production facilities. Hydrogen production facilities should be required to report additional information about the attributes of the electricity they consume for three main reasons. First, hydrogen facilities, particularly electrolysis facilities, consume very significant amounts of energy that could have major implications for upstream emissions and the electricity grid more broadly.[16] Second, many or most of these facilities will already be tracking the attributes of the energy they consume to qualify for federal incentives and investment and will therefore have this information readily available. Finally, because the entire purpose of producing hydrogen as a fuel is to reduce greenhouse gas emissions it is critically important to understand the lifecycle emissions of hydrogen production. If producing hydrogen leads to more upstream emissions than is gained through replacing fossil fuels in end-uses, then the climate benefits are eliminated. Because the hydrogen economy is still in its infancy, EPA has the ability to set clear reporting requirements that will allow for the collection of data necessary to develop policies and track hydrogen's overall emissions impact.

Specifically, we recommend that EPA require reporting on the attributes of energy consumed by hydrogen production facilities, including: 1) whether the energy is grid-supplied, from dedicated resources procured through power-purchase agreements or energy attribute certificates, or from behind-the-meter energy resources; 2) if grid supplied, the average generation makeup during the production facilities' operating hours; 3) if dedicated resources or behind-the-meter resources, the type of energy generation and year in which the resource came online; 4) if dedicated resources, the location of the energy source, location of the production facility, hours of generation, and operating hours of the production facility.

Footnotes

[16] Ricks et al., Minimizing Emissions from Grid-Based Hydrogen Production in the United States, 18 Environ. Res. Lett. 014025 (2023), https://iopscience.iop.org/article/10.1088/1748-9326/acacb5.

Response: The EPA is not finalizing subpart B; see section III.B of the preamble to the final rule for additional information. Further, the EPA did not propose or request comment on reporting specific energy attributes of hydrogen production facilities as suggested by the commenter, and is not taking final action on such requirements in this final rule. We may consider this comment as we evaluate other potential revisions to subpart P, which would be proposed in a future rulemaking to allow the proper notice and comment process.

11.6 Revisions to monitoring requirements for unconventional non-hydrocarbon feedstocks

Commenter Name: Karen Knutson
Commenter Affiliation: Chevron
Commenter Type: Industry
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0184-A1
Comment Excerpt Number: 7

Comment Excerpt: For Subpart P, we support the proposed revision that addresses emerging feedstocks for hydrogen production and provides alternative methods to determine their composition for GHG reporting.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

11.7 Comments on other revisions and clarifications in subpart P

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 44
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: To ensure clarity and consistency for reporters, EPA should consider harmonizing flare and process vent reporting requirements, as applicable, for merchant and non-merchant hydrogen plants. Currently subpart Y, as applicable to non-merchant hydrogen plants, requires reporting of flares and process vents. This is not currently a required reporting element under subpart P for merchant hydrogen plants and should be included.

Response: Currently, the subpart P mass balance calculation already accounts for all carbon from fuels and feedstocks being emitted such that adding process vents and flares as emission sources would likely double count emissions at merchant hydrogen production facilities. It may be appropriate to add these emission sources for hydrogen production facilities that use the CEMS methodology. We did not propose to add or request comment on adding process vents and flares as an emissions source under subpart P and are not taking final action on this request at this time. This comment is outside the scope of this rulemaking. We note that we anticipate that flaring and venting emissions at merchant hydrogen production facilities are small because the flared or vented streams at merchant hydrogen production facilities are expected to have low carbon content. The EPA acknowledges this comment and may consider it in a future rulemaking.

11.8 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart P

Commenter Name: Elizabeth Ravestijn
Commenter Affiliation: Air Products and Chemicals, Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0310-A1
Comment Excerpt Number: 7

Comment Excerpt: The proposal includes a requirement for facilities to report the "process type" for each hydrogen production unit (*i.e.*, SMR, SMR–WGS, POX, POX–WGS, Water Electrolysis, Brine Electrolysis, or Other (specify) (§ 98.166(b)(ii)) Air Products supports this proposal but asks that this information be treated as business confidential.

Response: The EPA proposed that the data element "For each hydrogen production unit, the type of unit (steam methane reformer (SMR) only, SMR followed by water gas shift reaction (WGS), partial oxidation (POX) only, POX followed by WGS, water electrolysis, brine electrolysis, or other)" (40 CFR 98.166(b)(1)(i)) would be assigned to the "Facility and Unit Identifier Information" data category and that the data element would be "emissions data" which is not entitled to confidential treatment. The commenter states that this proposed data element should be held as confidential.

As discussed in 75 FR 39094 (July 7, 2010), the "Facility and Unit Identifier Information" data category includes information needed to identify each facility and emission unit subject to reporting, including an emission unit or group identification number and the type of unit (*e.g.*, cement kiln, electric arc furnace, glass production furnace, lead smelting furnace, engine, turbine, boiler, process heater). The commenter did not provide any evidence or specific justification to demonstrate that this data element should not be assigned to the "Facility and Unit Identifier Information" category or that data in this data clement is not "emissions data" as defined at 40 CFR 2.301(a)(2)(i). The commenter did not provide information that this information is customarily and actually treated as private by the reporter. Therefore, the EPA is finalizing, as proposed, that this new data element is assigned to the data category "Facility and Unit Identifier Information," along with the categorical designation of "emission data." The EPA is revising the final rule to clarify that the type of unit may include autothermal reforming and autothermal reforming followed by WGS; this revision clarifies the unit types a reporter would be able to select within e-GGRT and does not change that the data reported is "Facility and Unit Identifier Information."

Commenter Name: Elizabeth Ravestijn
Commenter Affiliation: Air Products and Chemicals, Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0310-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA proposes Subpart P to require reporting of the quantity of hydrogen provided to each end-user (including both on-site use and delivered hydrogen).

Collecting this information creates confidentiality risks and administrative burden and Air Products does not believe that the perceived value of the information proposed for collection warrants the confidentiality risks and administrative burden. The information proposed to be collected is customer-specific and considered business confidential. These confidentiality concerns are even greater in the nascent and emerging market for low carbon hydrogen where

the supply and demand balance will be highly dynamic and competitive. We would prefer not to provide this information and risk inadvertently release.

Response: The EPA is not taking final action at this time on the requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for additional information.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 16

Comment Excerpt: EPA is seeking input on requiring sales information for hydrogen production. There are several reasons the Industry Trades believe this should not be required unless proposed through a separate rulemaking process. This information is considered "Confidential Business Information" (CBI) by both the seller and/or the buyer and may be restricted by confidentiality provisions in sales contracts; therefore, it should not be publicly reported.

Response: The EPA is not taking final action at this time on a requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for additional information.

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0315-A1
Comment Excerpt Number: 15

Comment Excerpt: EPA proposes to collect sales information.[39] EPA similarly does not provide justification for this proposal. Inexplicably, while this proposal targets information that very likely could be sensitive, particularly given that the hydrogen economy is developing and prices are likely to have significant variability as users compete for a scare product, EPA does not propose any protection for this data.[40] EPA's failure to provide a confidential determination for this highly sensitive data could be because it is not an input to any emissions equation. If the data is not an input for emission equations, then EPA should consider whether such sensitive data is relevant to EPA's data collection authorities and whether it should be collected at all.

Given that the hydrogen market is in the nascent stages of developing at scale, requiring reporting of this information could have a chilling effect on market development. If EPA plans to

move forward with a proposal along these lines, it should provide justification, include a requirement that the information either be anonymized or submitted as confidential business information, and provide a proposed rule on which interested parties may comment.

Footnotes

[39] See id. at 32,876.

[40] See Memorandum to the Docket, From Jennifer Bohman, Proposed Reporting Determinations for Data Elements Assigned to the Inputs to Emission Equations Data Category in Proposed Supplemental Revisions to the Greenhouse Gas Reporting Rule (May 2, 2023).

Response: The EPA is not taking final action at this time on a requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for additional information.

Commenter Name: Not provided
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0318-A1
Comment Excerpt Number: 15

Comment Excerpt: EPA proposes to collect sales information. EPA similarly does not provide justification for this proposal. Inexplicably, while this proposal targets information that very likely could be sensitive, particularly given that the hydrogen economy is developing and prices are likely to have significant variability as users compete for a scarce product, EPA does not propose any protection for this data.[28] EPA's failure to provide a confidential determination for this highly sensitive data could be because it is not an input to any emissions equation. If that is the case, EPA should consider whether such sensitive data is relevant to EPA's data collection authorities and whether it should be collected at all.

Footnotes

[28] See Memorandum to the Docket, From Jennifer Bohman, Proposed Reporting Determinations for Data Elements Assigned to the Inputs to Emission Equations Data Category in Proposed Supplemental Revisions to the Greenhouse Gas Reporting Rule (May 2, 2023).

Response: The EPA is not taking final action at this time on a requirement to report the quantity of hydrogen provided to each end-user. See section III.I.2 of the preamble to the final rule for additional information.

12.0 Comments on Subpart Q of Part 98

12.1 Revisions to monitoring requirements for use of analyses provided by material recyclers

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 11

Comment Excerpt: EDF supports EPA's proposal for facilities to determine the carbon content of process inputs and outputs using analyses provided by material recyclers that manage process outputs for sale or use by other industries. We note that EPA should require, to the maximum extent possible, that the primary responsibility for determination of the carbon contents of each of the terms used in each of the equations Q–1 through Q–8 in 40 C.F.R. § 98.173 rest with the facility operator instead of a supplier (as currently allowed) or a material recycler (as would be enabled by the new option). While an operator can obtain carbon content data from suppliers or recyclers, it is not always true that that data is representative of the carbon contents at each facility. For example, a supplier (to multiple operating facilities) may provide a range of carbon contents or perhaps an average carbon content — neither or which may apply to the facility. Obtaining average values of carbon contents for certain types of materials (such as, say, steel scrap) may be significantly erroneous unless there is a one-to-one relationship between the supplier and the operator. That is rarely the case. Similarly, a downstream recycler may obtain materials from several operators and simply provide all of them with an average value of carbon content, which would not represent the carbon contents for any of the facilities. Thus, while sources such as suppliers or recyclers are potentially useful, they cannot be as accurate as the first option — namely the use of site-specific determinations by the operator. EPA should clarify this clearly and indicate a strong preference that option one is to be used; and while other options (suppliers and recyclers) can be sources of such data, it is the responsibility of the operator to attest to the accuracy of such third-party carbon content data, for their specific facility.

Second, EPA notes that it "determined that the use of carbon content analyses from a material supplier was appropriate because the carbon content does not vary widely at a given facility...."[54] EPA does not provide any basis for this unsupported, conclusionary, statement. As a simple inspection of the parameters for equations Q–1 through Q–8 in 40 C.F.R. § 98.173 confirms, there are a wide range of carbon-containing inputs, products, byproducts, and waste materials, depending on the specific unit type covered in these equations. To presume, for all of the various materials, that their carbon content "does not vary widely" without data, is inappropriate. To the contrary, there can be significant variations in the carbon contents of these various materials in most instances for many reasons, including the fact that at most iron and steel mills multiple grades of products (using multiple types of recipes) can be made. This is particularly true of steel making; for example, at an EAF several hundred product grades can be made from the various heats —all from the same furnace. EPA's presumption is therefore incorrect.

Third, and related to the second, EPA presumes that variations in greenhouse gas emissions are accounted for due to changes in the production rate, which are more likely to vary. While production rates do vary and can clearly affect emissions, we note that EPA is not asking facilities to report the production levels for each and every grade of product made at a facility annually, for example. In fact, EPA incorrectly presumes that each ton of product made is similar. EPA's presumption that the overall (*i.e.*, without regard to grade) production level captures most of the variability — underlying a further presumption that carbon contents of various materials do not vary as much — is overly simplified. We recognize that accounting for each grade or product made and its emissions — in effect applying equations Q–1 through Q–8, as applicable, on a grade by- grade basis and then summing the results for all grades made in the reporting period — is unwieldy and some degree of simplification is administratively necessary. But EPA goes too far in its claims about how and where carbon-content and/or production variability affects emissions. EPA should support or remove these statements.

Footnotes

[54] 87 Fed. Reg. at 36,960

Response: EPA is amending subpart Q, as proposed, to allow reporters a third option to determine the carbon content of process inputs and outputs, specifically analyses provided by material recyclers that manage process outputs for sale or use by other industries.

First, the commenter stated that EPA should indicate a strong preference for the facility operator making site specific carbon content measurements. The commenter further stated that other options (suppliers and recyclers) can be sources of such data, but that the operator should have the responsibility to attest to the accuracy of such third-party carbon content data. EPA notes that the addition of this third option for measuring carbon contents does not impact the existing requirement that facilities certify the accuracy of reported data. Under subpart Q, EPA has not historically indicated that certain methods of determining carbon content were preferred over other methods. Similarly, the proposed rule had not included such a distinction. EPA agrees that it is likely preferrable for facilities to measure the carbon contents of certain process inputs and outputs. However, EPA does not presently have information on hand to indicate that it would always be preferable that facilities make these site-specific measurements. For instance, there may be cases where minimal information is gained when making these site-specific measurements, compared to the additional effort spent on the materials testing. Therefore, EPA is not including this indication in the final rule, although EPA may consider this in future actions were EPA to have information on the circumstances where the site-specific measurements are most useful.

Secondly, the commenter objected to the statement in the preamble of the June 2022 proposed rule that "carbon content does not vary widely at a given facility." However, the commenter appears to have misinterpreted the statement. This statement was meant to apply to an individual process inputs or outputs, *i.e.*, that the carbon content of the gaseous fuel used at a facility may not vary widely. EPA agrees with the commenter that the carbon contents vary significantly across the various process inputs and outputs and continues to require individual measurements of each. Overall, this comment does not provide information that supports removal of the additional carbon content method included in this final action.

Finally, the commenter stated that subpart Q methods do not adequately factor in the influence of various grades of product when determining emissions. The EPA is not proposing and is not finalizing changes to the subpart Q methodologies to account for the influence of production levels of different grades of product on emissions. The EPA may consider this in a future rulemaking.

12.2 Revisions to report unit types, annual production, and annual operating hours by unit

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 9

Comment Excerpt: We generally support EPA's proposed revisions to subpart Q, and provide some suggestions for further refinements. We agree with EPA that the annual production capacity in combination with annual operating hours would provide useful information for understanding variations in annual emissions and would help to verify reported data. This data would provide useful information to understand trends across the sector and support analysis of these sources. EDF therefore supports EPA's proposal to require that facilities report the type of unit and the annual production capacity of each unit.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 10

Comment Excerpt: As proposed, the use of the term "annual production capacity" is confusing because the word "capacity" can sometimes mean the rating or design capacity of the unit as opposed to the available or actually utilized capacity of the unit during the specific time period. Since the goal of the reporting program is to provide estimates of actual emissions and the goal of including these additional parameters is to enable EPA to readily compare reported emissions across various time periods (and thereby understand changes over time), EPA should ask facilities to report actual production levels (not capacity) from each unit. For example, if the production capacity of an EAF is 800,000 tons of steel per year, but the actual production level was 600,000 tons of steel from that EAF, we presume that EPA would be interested in the latter and not the former. Thus, asking for the actual production level and not the production capacity

would be a better approach. Second, while we support the collection of actual operating hours for each unit, that information will not provide any additional value in estimating annual emissions since the annual emissions will depend on the annual production level we have noted prior.

Response: EPA is requiring facilities to report the annual production capacity and the annual operating hours for each unit.

The commenter noted the EPA should request facilities to report actual production levels (not capacity) from each unit rather than the annual production capacity. However, facilities using the carbon mass balance method in 40 CFR 98.173(b)(1) to determine CO_2 emissions are *already* required to measure and report annual production parameters based on the unit type. This information is entered into the Inputs Verification Tool (IVT) (see 79 FR 63772, October 24, 2014). Similarly, facilities using the CEMS method currently report the relevant production values under 40 CFR 98.176(b). Information on annual production capacity would allow the EPA to perform facility or unit specific verification checks on the annual production and the reported emissions. Additionally, reporting of annual production capacity is required throughout Subpart 98, and this new data element is consistent with other subparts.

Finally, EPA acknowledges the commenters support for requiring the reporting of annual operating hours for each unit.

12.3 Comments on other revisions and clarifications in subpart Q

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 12

Comment Excerpt: EDF also supports the proposal to correct Equation Q–5 to remove the unnecessary fraction symbol. This change corrects an obvious error in how equation Q–5 is shown in 40 C.F.R. § 98.173(b)(1)(v). The inclusion of the divisor line in the equation is a conspicuous but unambiguous error that is unlikely to have caused any actual reporting issues. But, we support correcting it and removing the confusing horizontal "divisor" line in equation Q–5. Finally, EDF supports the proposed addition of ASTM method E415-17, Standard Test Method for Analysis of Carbon and Low-Alloy Steel by Spark Atomic Emission Spectrometry (2017).

Response: The EPA acknowledges the commenter's support for the proposed revisions.

Commenter Name: David Miracle
Commenter Affiliation: Nucor Corporation
Commenter Type: Industry
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0171-A1
Comment Excerpt Number: 2

Comment Excerpt: Under subpart Q of the current Mandatory Greenhouse Gas Reporting Rule, there is no guidance on how to report biogenic and non-biogenic CO_2 emissions related to use of biomass-based alternatives for carbon used in the EAF. When reporting biogenic emissions due to combustion of biomass-based fuels under Subpart C, a facility may subtract biogenic emissions from the total and then report the associated biogenic emissions separately. The current e-GGRT system is set up to allow the separate reporting of biogenic CO_2 emissions from an EAF, only if reporting is based on CEMS data. This means biogenic CO_2 cannot be subtracted from the total if the site-specific emission factor (*i.e.*, stack test) or mass balance approach are used.

Although there are various additions of data elements to account for new source categories and emission sources, the proposed rule does not address the reporting of biogenic vs. non-biogenic CO_2 emissions related to use of biomass-based alternatives for carbon used in the EAF. However, this is a potential strategy for GHG emissions reduction. As such, Nucor would like to propose that the rule be revised to include such provisions when the site-specific emission factor (*i.e.*, stack test) or mass balance approaches are used. Subpart Q should be updated to account for biogenic CO_2 under the mass balance approach (98.173(b)(1)) and site-specific method (98.173(b)(2)). As the separate reporting of biogenic CO_2 is allowed under the Tier 4 Methodology (98.173(a)), this addition would increase consistency across the various calculation methodologies.

Response: This comment is out of scope for this rulemaking. The EPA did not propose and is not finalizing requirements regarding the reporting of biogenic vs. non-biogenic CO_2 emissions related to biomass-based materials used in EAFs at this time. The EPA may consider this in a future rulemaking.

12.4 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart Q

Commenter Name: David Miracle
Commenter Affiliation: Nucor Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0171-A1
Comment Excerpt Number: 1

Comment Excerpt: The proposed revisions propose to establish and/or amend confidentially determinations for the reporting of certain data elements. Nucor supports the inclusion of such confidentiality determinations and would like to ensure that such determinations will be made with the publishing of the proposed rule. Under the proposed revisions, the iron and steel production sector, under Subpart Q, will now be required to report information such as the type of unit, annual production capacity, and total operating hours of each unit. While Nucor has no comments or objections on the addition of these requirements, Nucor would like to ensure that

the proposed confidentially provisions are included in the rule's revisions as proposed, so such information is not made publicly available.

Response: The commenter references three data elements, including the unit type (40 CFR 98.176(g)), the annual production capacity for each unit (40 CFR 98.176(g)), and the annual operating hours (40 CFR 98.176(g)).

EPA agrees with the comment that confidentiality determinations should be included in the final rule, and EPA is making the final confidentiality determination for these data elements in this action. However, EPA understands that the commenter is suggesting that these data elements should be eligible for confidential treatment. EPA did not propose and is not finalizing that these data elements would be eligible for confidential treatment.

EPA proposed that the new data element, unit type, would be assigned to the "Facility and unit identifier" emission data category. Since this data element is assigned to a data category with a categorical designation of "emission data," it will not be eligible for confidential treatment consistent with other data found to be "emissions data." Additionally, EPA found that the unit type is already publicly available for facilities in this sector that use the mass balance calculation method. For facilities using CEMS or the site-specific emission factor, EPA found that the unit's name often contains information indicating the unit type within the previously reported data.

The EPA proposed to assign the new data element, annual production capacity for each process unit, a confidentiality determination of "no determination," which aligns with other production industries required to report annual production capacity under 40 CFR part 98. The EPA will evaluate the confidentiality status of data elements with no determination on a case-by-case basis in accordance with existing regulations in 40 CFR part 2, subpart B because capacity data elements may be customarily and actually treated as private by some reporters but may be publicly available in some instances (see 76 FR 30801, May 26, 2011).

The EPA proposed that the new data element, annual operating hours for each process unit would not be eligible for confidential treatment. The commenter did not provide any evidence or justification to demonstrate that annual production capacity and annual operating hours data are customarily and actually treated as private by the reporter. In addition to the rationale included in the proposed rule CBI memo, the EPA has found that annual operating hours data are readily available in air permits or inventories provided to states. Therefore, the EPA is finalizing the confidentiality determinations as proposed. See the final memorandum "Confidentiality Determinations and Emission Data Designations for Data Elements in the 2024 Final Revisions to the Greenhouse Gas Reporting Rule" available in the docket to this rulemaking, EPA-HQ-OAR-2019-0424.

13.0 Comments on Subpart S of Part 98

13.1 Revisions to calculation methods to allow subtraction of CO_2 captured and used in other onsite processes

Commenter Name: Johnathan DeAth
Commenter Affiliation: National Lime Association (NLA)
Commenter Type: Industry Trade Association

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0197-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA proposes to modify equation S–4 to subtract CO_2 that is captured and used onsite on a monthly basis. Currently, in e-GGRT, the question "was CO_2 used on site" (answer Yes or No) is posed. If the answer is Yes, the annual quantity used, in metric tons, must be entered. Facilities that currently use CO_2 onsite report this usage on an annual basis in e-GGRT. The proposed rule would require monthly subtraction of CO_2 used onsite. This is cumbersome for facilities that track and report this usage on an annual basis. Monthly reporting would be considerably more burdensome, to lime producers. Therefore, it is requested that EPA continue to allow the annual reporting of CO_2 usage, and thus implement an annual subtraction from total process emissions from all lime kilns combined.

Response: See section III.K.2 of the preamble to the final rule for the EPA's response to this comment.

13.2 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart S

Commenter Name: Johnathan DeAth
Commenter Affiliation: National Lime Association (NLA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0197-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA is correct to designate additional reporting requirements for Subpart S CEMs and mass balance methodology as CBI. EPA is proposing related confidentiality determinations — which NLA supports — for the additional data elements, as is also stated in section III.I of the rule preamble. Section VI of the rule preamble notes that 193 new and substantially revised data elements not proposed to be designated as "emission data," or "inputs to emission equations," are proposed to be reported under subparts...S....Table 2 in the March 2022 EPA memo titled "Proposed Confidentiality Determinations and Emission Data Designations for Data Elements in Proposed Revisions to the Greenhouse Gas Reporting Rule" (Docket Id. No. EPA-HQ-OAR-2019-0424) notes that the proposed data elements would be afforded CBI designations. NLA concurs with EPA's CBI designations for the data elements proposed to be collected by EPA.

Response: The EPA acknowledges the commenter's support. However, the EPA is not taking final action on the requirement to calculate and report net CO_2 process emissions and the proposed revisions to 40 CFR 98.196(b)(1). See section III.K of the preamble to the final rule for additional information.

14.0 Comments on Subpart W of Part 98

Comments received to subpart W of part 98 (Petroleum and Natural Gas Systems) on the 2022 Data Quality Improvements Proposal are included as Appendix A to this document. The EPA is not taking final action in this final rule on proposed revisions to subpart W from the 2022 Data Quality Improvements Proposal. See section I.C of the preamble to the final rule for additional information.

15.0 Comments on Subpart X of Part 98

15.1 Revision to clarify calculation requirements for flares

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 15

Comment Excerpt: We offer two suggestions on EPA's proposed revisions to 40 C.F.R. § 98.243(b)(3) and (d)(5). First, we urge EPA to require subpart X reporters to report emissions attributable to the combustion of pilot gas. The quantity of pilot gas and its composition should be known to operators and the combustion emissions can be estimated with simple calculations. Although pilot gas combustion may not result in the same volume of greenhouse gas emissions as flaring, as flaring is reduced the emissions from pilot gas combustion will begin to represent a larger fraction of overall flaring emissions.

Second, we ask EPA to revisit the exclusion of SSM events based on the 500,000 scf/day threshold as currently noted in equation Y–3. The 500,000 scf/day threshold is not clearly supported by any technical basis. Spread uniformly over the course of a day, this flow is slightly under 350 scf/minute. This is not an insubstantial flow of waste gases. Depending on the composition of this waste gas flow, substantial quantities of greenhouse gas emissions can result. Excluding gas released during SSM events of less than 500,000 scf/day from equation Y–3 is inconsistent with EPA's overall goals of understanding emissions and reducing flaring at all industrial facilities including subpart X and Y reporting facilities.

Response: The commenter suggested two changes to the emissions reporting for flares. The first suggestion was to require reporting of pilot gas emissions. We disagree with this suggestion for the reasons cited in the January 15, 2016, proposed amendments FR notice (81 FR 2559, January 15, 2016). Specifically, emissions are relatively small and may be difficult to determine without installation of a meter. Some facilities do not have unit-specific meters for the pilot gas, and installation of a meter is a burden that we did not intend to propose requiring in this rulemaking.

The commenter's second suggestion was for EPA to review the basis for the 500,000 scf/day threshold for calculating and reporting emissions from SSM events when using Equation Y–3. We note that this regulatory package specifically proposed clarifying the emissions calculation

requirements for flares, to clarify a point of confusion resulting from the 2016 amendments (81 FR 89188). The package did not propose to or request comment on revising the 500,000 scf/day threshold which was promulgated in 2009 (74 FR 56260); this comment is out of scope for this rulemaking. The associated rationale for the 500,000 scf/day threshold was set forth for notice and comment during the development of the 2009 final rule, which the 2016 amendments did not alter.

15.2 Revisions to report CO_2, CH_4, and N_2O emissions from flares burning off-gas

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 13

Comment Excerpt: We support EPA's proposal to add a reporting element in 40 C.F.R. § 98.246(b)(7) and (c)(3) for each flare that is reported under the CEMS and optional ethylene combustion methodologies. This would require reporters to also report estimated fractions of the total CO_2, CH_4, and N_2O emissions from these flares that are due to combusting petrochemical off-gas. EPA believes the current requirements result in an overestimate of emissions attributed to a petrochemical process unit when the flare is not dedicated to a petrochemical process unit, particularly if the flare is also used to combust off-gas from non- petrochemical process units. According to EPA, the proposed requirement would allow the fractions attributed to each petrochemical process unit that routes emissions to the flare to be estimated using engineering judgment and would allow more accurate quantification of emissions both from individual petrochemical process units and from the industry sector as a whole. We support these updates and suggest further improvements below.

EDF supports improving the accuracy of flare reporting. However, EPA's proposal does not clearly distinguish between petrochemical off-gas and non-petrochemical off-gas when various units capable of such off-gassing are present at a given facility. If non-petrochemical units are present whose function is to support the petrochemical units, the off-gases from such units—if flared—should be accounted for in the petrochemical unit off-gases. We encourage EPA to provide more details about the extent of this overestimation that it seeks to correct via this proposed distinction.

EPA further notes that reporters will use "engineering judgment" to attribute fractions "to each petrochemical process." We are concerned that deference to engineering judgment could lead to inaccurate reporting. Accordingly, EPA should require that any such engineering judgment be based on supported, site-specific, and disclosed facts.

Response: The EPA acknowledges the commenter's support for the proposed revisions. However, we disagree with the commenter's recommended enhancements to improve the accuracy of flare emissions reporting by attributing flared emissions from non-petrochemical process units that support the petrochemical process units to the petrochemical process units

subject to subpart X. Under the suggested reporting paradigm, it would be logical to also require process emissions from these units to be reported under subpart X, which is clearly not the intent of subpart X. In response to the comment that EPA should provide details about the extent of the overestimation that it seeks to correct, the EPA does not have enough information to provide a precise estimate.

The commenter also stated that EPA should require that any engineering judgment be based on supported, site-specific, and disclosed facts to minimize the potential for inaccurate reporting. The engineering judgment provision was added for estimating the fraction of flare emissions attributable to the petrochemical process to align with the use of the same technique in 40 CFR 98.246(b)(4) and (5) for estimating the fraction of emissions at continuous monitoring locations that are attributable to the petrochemical process unit. We expect that this methodology will provide data of acceptable quality for the intended purposes. Additionally, 40 CFR 98.3(g)(2) requires reporters to keep records of the data used to calculate the GHG emissions for each unit, operation, process, and activity. This would include data to support the selection of the reported fractions. These records are subject to inspection and audits by EPA if there are any concerns that the reported fractions are unrealistic.

15.3 Revisions to report names and annual quantity of each product produced in each ethylene production process under the optional ethylene combustion methodology

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 14

Comment Excerpt: We support EPA's proposal to add a requirement in 40 C.F.R. § 98.246(c)(6) to report the names and annual quantity (in metric tons) of each product produced in each ethylene production process under the optional ethylene combustion methodology. We agree that this proposed change would make product reporting under the optional ethylene combustion methodology consistent with product reporting requirements under the CEMS and mass balance reporting options, and that data on the quantities of all products will be useful in informing future policy decisions.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

15.4 Revisions to petrochemical and product reporting requirements for integrated ethylene dichloride/vinyl chloride monomer (EDC/VCM) process units.

Commenter Name: Domenic DeCaria
Commenter Affiliation: Vinyl Institute (VI)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0243-A1
Comment Excerpt Number: 3

Comment Excerpt: Based on a July 10, 2015 letter received from Occidental Chemical Company, EPA made changes to Subpart X in 2016. Occidental explained that in an integrated EDC/VCM process unit, EDC is continuously produced as an intermediate. Production streams pass back and forth between the EDC and VCM portion of the unit. The streams are not isolated and not measured in a manner that would allow for accurate calculations of the amount of intermediate EDC produced. Hence, EPA revised the rule to allow that the total reported amount of EDC produced could be based on a measurement or an estimate.

Some facilities with an integrated EDC/VCM process unit withdraw small amounts of EDC as a separate product stream. In this proposed rule, EPA appears to be attempting to clarify that the amount of EDC product not used as an intermediate would be treated as if it came from a standalone EDC unit and this amount would be added to the amount of intermediate EDC, and the total would be reported under § 98.246(a)(5) as the amount of EDC petrochemical produced by the integrated EDC/VCM process unit.

Rather than prescribe the method of measurement of this EDC stream that is separated from the EDC used in VCM production, VI proposes that EPA limit the requirement to the reporting of the value measured and calculated through reliable and known practices. EPA should allow either the use of company records or the use of "best available information" to quantify this stream. Prescribing new measurement methods will increase the compliance burden and associated costs for flow meters that meet the calibration accuracy specified in 40 CFR 98.3(1), along with the maintenance burden for calibrating new process equipment.

Response: The EPA did not propose a new or additional measurement requirement. The intent of the proposed changes to 40 CFR 98.246(a)(5) is to clearly specify that the amount of petrochemical to report should include both the estimated or measured amount of intermediate EDC that is used in the production of vinyl chloride monomer (VCM) plus the measured amount of any withdrawn EDC product that is not used for VCM production. Any EDC withdrawn from an integrated process unit is a carbon-containing output of the integrated process unit and thus is a product according to the definition of product in 40 CFR 98.248. According to 40 CFR 98.243(c)(1), the volume or mass of each product must be measured (in accordance with the procedures in 40 CFR 98.244(b)(2) or (3)). This provision is unchanged by the amendments. Thus, since the withdrawn EDC is a product, it must be measured the same as any other product; "best available information" may not be used to calculate the amount of such product streams.

Commenter Name: Domenic DeCaria
Commenter Affiliation: Vinyl Institute (VI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0243-A1
Comment Excerpt Number: 6

Comment Excerpt: Under the mass balance option, the amount of product must be a measured value because the quantity is used in the emissions calculation equation; thus, the entire integrated unit could be considered the petrochemical process unit so the amount of VCM product could be the primary reported product, and it would be measured. Under the CEMS option, the product quantity is used only in data verification procedures and other data analyses, and the EPA has tentatively determined that, for these purposes, reporting an estimated value is an acceptable alternative to incurring the expense of modifying an integrated unit process unit so that measurements can be taken. In consideration of these points, VI agrees with EPA's proposal, by revising 40 CFR 98.246(b)(8) such as to remove language related to considering the petrochemical process unit to be the entire integrated EDC/VCM process unit. [87 Fed. Reg. 36997]

Response: The EPA acknowledges the commenter's support for the proposed revisions.

15.5 Comments on other revisions and clarifications in subpart X

Commenter Name: Domenic DeCaria
Commenter Affiliation: Vinyl Institute (VI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0243-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA is proposing to amend § 98.246(a)(2) to remove the requirement to report feedstock and product names. EPA has determined that the language in § 98.246(a)(2) is also identical to the language in § 98.246(a)(12) & (13). To eliminate redundancy, EPA is proposing to remove the following language:

Users of the mass balance methodology in § 98.243(c) must report the information specified in paragraphs (a)(1) through (15) (13) of this section for each type of petrochemical produced, reported by process unit.

> (1) The petrochemical process unit ID number or other appropriate descriptor.
>
> (2) The type of petrochemical produced, names of products, and names of carbon containing feedstocks.

This change reduces the reporting burden, which is an outcome that VI supports.

Response: The EPA acknowledges the commenter's support for the proposed revisions. However, to be clear, of the language cited by the commenter, we proposed removing only "names of products, and names of carbon containing feedstocks" in 40 CFR 98.246(a)(2). We did not propose removing 40 CFR 98.246(a)(1) or the requirement to report "the type of petrochemical produced" in 40 CFR 98.246(a)(2). The changes are being finalized as proposed.

16.0 Comments on Subpart Y of Part 98

16.1 Revisions to the source category definition

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 19

Comment Excerpt: The Industry Trades support the removal of reporting requirements for non-merchant hydrogen production plants in Subpart Y, and instead report these units under Subpart P. Likewise, the Industry Trades support the reporting of coke calcining units in the newly added Subpart WW.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

16.2 Revisions to calculation requirements for delayed coking units (DCU) (Equations Y–18a and Y–18b)

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 17

Comment Excerpt: We also support the addition of the phrase "or draining" to the definitions of "M_{water}" and "H_{water}" in equation Y–18b. We ask that the steam generation model used to account for the heat balance at a DCU use site-specific data to the maximum extent possible. Thus, we also support the use of the "f_{coke}" variable to account for situations when the coke bed is not fully submerged. However, the "universality" of this parameter should not mean that a single value be used in all cases. Rather, the value of the "f_{coke}" parameter should be based on site-specific data reflecting site-specific, typical practices including the degree to which the coke bed is or is not submerged.

Response: The EPA acknowledges the commenter's support for the proposed revisions. We note that the "f_{coke}" variable is proposed to be defined as the fraction of coke-filled bed that is covered by water at the end of the cooling cycle just prior to atmospheric venting or draining. The "f_{coke}" value will be a site-specific value in any case where the coke bed is partially submerged. When the coke is completely submerged, a value of 1 must be used.

16.3 Revisions to reporting requirements (98.256)

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 16

Comment Excerpt: We support EPA's proposed additional reporting requirements for DCU data collection, including requiring facilities to report, for each DCU: (1) the internal height of the DCU vessel; and (2) the typical distance from the top of the DCU vessel to the top of the coke bed (*i.e.*, coke drum outage) at the end of the coking cycle (feet). We agree with EPA that these new elements will allow EPA to estimate and verify the reported mass of dry coke at the end of the cooling cycle as well as the reported DCU emissions.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 45
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: We question the rationale for EPA to begin collecting data that are not necessarily part of the calculations used to generate the emission estimate. EPA has proposed to require operators to report 1) the internal height of the DCU vessel, and 2) the typical distance from the top of the DCU vessel to the top of the coke bed (*i.e.*, coke drum outage) at the end of the coking cycle (feet), with the stated intent of improving EPA's ability to verify emissions reported by operators using mass measurements. While retention of the above elements are required for operators using equation Y–18, these elements are not inputs to the mass measurement approach. As such, it is not clear how reporting of these specific elements would improve the ability of EPA to verify emissions reported using the mass measurement approach. Further, while EPA has asserted that there should be no increased burden because they are likely available in existing company records, this may not be the case for all operators.

Response: We disagree that collecting additional data from facilities using the mass measurement approach will not enhance EPA's verification of the facility recorded values because the added reporting elements provide a means to independently estimate the dry mass of coke in the DCU at the end of the coking cycle. The mass of coke, irrespective of whether it is determined using company records or estimated using Equation Y–18a, is an input to the

emissions calculations for DCU, namely equations Y–18e and Y–18f. For reporters electing to use mass measurements from company records, the EPA currently has no means to verify the mass measurements of coke retained in the verification software records (*i.e.*, the inputs verifier tool (IVT)) other than to compare year-to-year values for outliers. In contrast, for facilities electing to estimate the mass of coke using Equation Y–18a, the EPA requires the inputs (*i.e.*, height of the coking vessel, coke drum outage, and diameter) to be entered into IVT as equation inputs. The IVT data are then used to determine an EPA-estimated mass of coke to compare to the facility's quantity of mass of coke entered into IVT. By requiring reporters electing to use the mass measurement approach to report the height of the coking drum and the drum outage, the EPA can make similar estimates of the mass of coke to compare directly to the value entered by facilities in IVT. With respect to the burden associated with these added reporting elements, we expect that equipment design and operating parameters are known by nearly all if not all facilities, and did not receive any specific information from commenters that demonstrated any facilities do not know such parameters; thus, we maintain that the burden, if any, is expected to be insignificant. We are finalizing these reporting elements as proposed.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 20

Comment Excerpt: EPA's rationale for requesting the capacity of each asphalt blowing unit is not clear to the Industry Trades, nor is it clear how this data would be used. It is unclear how the individual capacity data will support more accurate reporting. With the additional data collection and reporting requirements, the Industry Trades would like to better understand EPA's reasoning for requesting this information, so that we can recommend the most appropriate and effective data to meet EPA's objectives.

Response: The EPA routinely collects unit-level capacity data for equipment in 40 CFR part 98 subpart Y. We use these data to perform statistical analyses as part of our verification process. For example, there are a number of verification analyses performed which correlate rated equipment capacity to expected GHG emissions. These analyses have allowed the EPA to develop ranges of expected emissions by emission source type and successfully identify outliers in the reported data. To date, we have been unable to perform analogous analyses for asphalt blowing operations. The collection of capacity data for asphalt blowing will enable the EPA to perform analogous verification checks thereby increasing and improving our ability to verify emissions comprehensively for 40 CFR part 98 subpart Y emission sources.

16.4 Revisions to monitoring to allow use of mass spectrometer analyzers

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Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)

Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 22

Comment Excerpt: We ask that EPA provide additional information regarding its proposal to allow the use of mass spectrometer analyzers to determine gas composition and molecular weight without the use of a gas chromatograph. Specifically, we request information demonstrating that the use of direct mass spectrometer analyzers alone provides the same level of accuracy in determining the composition of a gas stream as would be possible by first using gas chromatographic pre separation followed by a mass spectrometer analyzer. While we agree that reduced cycle time is a desirable goal, it is not appropriate if the underlying accuracy of the gas composition is compromised. Similarly, just because direct mass spectrometry without gas chromatography is used by refinery operators to determine gas composition, as noted by EPA, it does not mean that such determinations are accurate or accurate enough for the determination of greenhouse gas emissions. Therefore, we ask that EPA provide support for the level of accuracy in the proposed approach to determining gas composition as compared to the combined gas chromatograph and mass spectrometer approach.

Response: First, it must be clearly understood that the gas chromatography (GC) methods in subpart Y do not have to use mass spectrometry (MS) as the detection method. Detectors allowed in the GC methods currently provided in subpart Y include the use of flame ionization detectors (FID), thermal conductivity detectors (TCD), or photo ionization detectors (PID) in addition to MS detectors. FID, TCD, and PID detection methods cannot speciate the compounds in a mixture and cannot confirm the speciation of the compounds detected beyond what the chromatographic retention time reveals. For these detection methods, it is the retention time of the compound from the GC that is used to determine the chemical's identity and the detector is used only to determine its relative concentration. Some chemicals may co-elute (*i.e.*, have the same elution time) from the GC based on the ability of the GC column to separate, which may make full speciation of the compounds difficult using these other detectors. For research studies, MS is commonly used because the pattern of mass to charge ratios (output of MS detectors) can provide additional compound identity. Mass detector response can in many cases also be used to determine the identity and relative concentrations of compounds that co-elute without chromatographic separation. However, in most industrial applications, GC/MS is not commonly used, but rather GC is coupled with FID, TCD, or PID.

While we agree that GC/MS may be preferable to direct MS because you have independent assessments of chemical identity and because the mass spectrum is easier to analyze with two compounds co-eluting than with a multiple compounds "co-eluting" when no GC is used, that is not the appropriate comparison. The comparison that needs to be made is between direct MS and GC with FID, TCD, or PID. We find that, with advances in direct MS methods and computational algorithms, direct MS offers adequate accuracy for chemical identification and concentration determinations compared to GC used with the other detection methods. Thus, the EPA confirms that the accuracy of direct MS when following the manufacturer's operation, calibration and maintenance requirements are similar to the accuracy of GC methods. The EPA has promulgated the use of mass spectrometer analyzers to determine gas composition and molecular weight without the use of a gas chromatograph in other rules, such as the NESHAP for

Ethylene Production facilities (40 CFR part 63 subpart YY). EPA also recently proposed to include this option in the Refinery NESHAP (40 CFR part 63, subpart CC). These part 63 provisions provide requirements for calibration and operation of mass spectrometers that parallel the requirements for gas chromatographs.

16.5 Comments on other revisions and clarifications in subpart Y

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 18

Comment Excerpt: We support EPA's proposal to add clarifying language to 40 C.F.R. § 98.253(c) and 98.253(e) to reiterate the language from 40 C.F.R. § 98.252(b) that the emissions being quantified in these paragraphs are coke burn-off emissions rather than emissions that may occur from other venting events. We ask EPA to clarify where the greenhouse gas emissions from the other venting events at these units, as applicable, would be addressed.

Response: The EPA acknowledges the commenter's support for the proposed revisions. Generally, a catalytic reforming unit has several venting cycles including depressurization venting, purging, and venting that occurs during catalyst regeneration (*i.e.*, coke burn-off). Typically venting from depressurization or purging, is sent to either a boiler or flare depending on the equipment configuration. The venting from the coke burn-off is rarely sent to a flare or boiler. The calculation procedures in section 98.253(e) for catalytic reforming units, as clarified in the proposed rule, are specific to the coke burn-off venting event(s) when they are not routed to a flare or boiler. Emissions from a boiler or flare used to control any venting from the catalytic reforming unit are reported to subpart C or subpart Y, as appropriate. If any of these other venting activities are released directly to the atmosphere, any GHG emissions resulting from these venting releases would be calculated using the process vent method in 40 CFR 98.253(j), provided the GHG content of the vent streams meets on or more of the criteria in 40 CFR 98.253(j).

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 20

Comment Excerpt: We support correcting the erroneous cross-reference in 40 C.F.R. § 98.253(1)(5) relating to the term M_{stream} in equation Y–18f for DCUs.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 19

Comment Excerpt: We do not support the exclusion of events with gas flows of 500,000 scf/day or below from equation Y–3. EPA should require the inclusion of all gases, including purge and sweep gases as was revised in 2016, as well as pilot gas. We do not believe that achieving consistency requires perpetuating the exclusion of SSM events less than 500,000 scf/day. SSM events, even those below 500,000 scf/day, can lead to significant flaring and harmful emissions that EPA should gather data on to better understand and use to inform regulatory approaches that minimize or eliminate such events. EPA should at least explain why reporting of emissions from flaring during these SSM events should not be reported.

Response: We note that this regulatory package specifically proposed clarifying the emissions calculation requirements for flares, to clarify a point of confusion resulting from the 2016 amendments (81 FR 89188). The package did not propose to or request comment on revising the 500,000 scf/day threshold which was promulgated in 2009 (74 FR 56260); this comment is out of scope for this rulemaking. The associated rationale for the 500,000 scf/day threshold was set forth for notice and comment during the development of the 2009 final rule, which the 2016 amendments did not alter.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 21

Comment Excerpt: We support the proposed recordkeeping requirement for the "f_{coke}" variable and removal and reservation of the recordkeeping requirements in § 98.257(b)(54)-(56) since equation Y–19, the process vent calculation method, is no longer used to calculate DCU emissions.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

17.0 Comments on Subpart DD of Part 98

17.1 Revisions to the source category to include equipment containing F-GHGs other than SF_6 or PFCs to account for alternative gas mixtures

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 6

Comment Excerpt: While it is generally reasonable to update the requirements for Subpart DD, given changes in the gases used to insulate T&D equipment—particularly the move to gases with lesser Global Warming Potential (GWP), EPA should ensure that its reporting requirements recognize the benefits of using these different fluorinated GHGs (F-GHGs) and do not serve to discourage this beneficial change. EPA also should note that efforts to reduce SF_6, PFC, and F-GHG emissions from T&D equipment should be addressed via the successful voluntary SF_6 Emission Reduction Partnership for Electric Power Systems (EPS Partnership), which the Agency manages.

Including F-GHGs as emissions that should be reported under Subpart DD is appropriate, as their use as an insulator for T&D equipment is increasing. Accordingly, the conforming changes to the definition of "facility," proposed 40 C.F.R. § 98.304(b), also are appropriate.

EPA claims that, while the use of alternative insulation gases generally will result in lower GHG emissions, the Agency expects that increased usage of these alternative technologies, particularly fluoronitrile mixtures, could still significantly contribute to the total GHG emissions from this sector if used in large quantities. See 87 Fed. Reg. at 37,000. Such an increase in emissions related to increased use of F-GHGs and mixtures involving F-GHGs in place of SF_6 or PFCs to insulate T&D equipment, however, has not yet come to pass and EPA has not indicated if this potential outcome is likely to happen in a reasonably near timeframe, particularly as EPA has not indicated the prevalence of the switch from SF_6 to other F-GHGs. It is appropriate to modify the requirements of Subpart DD to capture these emissions, but any concerns that EPA may have about increased emissions from these facilities would be best addressed via the successful SF_6 EPS Partnership. This collaborative effort between EPA and the electric power industry works to identify, recommend, and implement cost-effective solutions to reduce SF_6 emissions.

Any concerns about emissions related to the use of F-GHGs in place of SF_6 should be addressed via the EPS Partnership.

Response: The reporting of alternative insulation gases with GWPs greater than one will improve the accuracy and completeness of the emissions reported under this subpart and enhance the overall quality of data collected under the GHGRP. As discussed in the preamble to the final rule, the EPA is excluding insulating gases with weighted average GWPs of one or less from the reporting requirements of subpart DD. The EPA agrees that the SF_6 Partnership for Electric Power Systems can help facilities to quantify and decrease their emissions of not only SF_6, but other insulating gases that contain fluorinated GHGs.

17.2 Comments on specific revisions to calculation, monitoring, and reporting requirements to include F-GHGs other than SF_6 or PFCs

Commenter Name: Katherine Rubin
Commenter Affiliation: Los Angeles Department of Water and Power (LADWP)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0245-A1
Comment Excerpt Number: 1

Comment Excerpt: LADWP asks EPA to clarify in the final rule, that the equipment user should account for insulating gas remaining inside gas-insulated equipment (GIE), specifically fully charged switches and hermetically sealed GIE that are transferred to another entity (vendor) for repair or salvage, in addition to equipment that is sold, as a gas disbursement in the equipment user's mass-balance emission calculation (Equation DD–3).

Since the equipment (with gas inside) is leaving the equipment user's inventory, it should be counted as both retired equipment and a gas disbursement in the equipment user's emission calculation in order to balance out. If the equipment is sent for repair and will be returned, the equipment user retains ownership of the equipment. If the equipment is sent for salvage and will not be returned, the equipment user is paying the vendor to dismantle the equipment rather than the vendor buying the equipment. Neither of these scenarios seems to fit under equipment that is sold to other entities.

Ideally, the vendor should communicate to the equipment user how much insulating gas the vendor extracted from the switch; this value should be counted as a gas disbursement in the equipment user's emission calculation. In the absence of that communication, as a practical matter the equipment user will need to count the GIE nameplate gas capacity value as a disbursement, similar to how fully charged switches and hermetically sealed equipment are counted as an acquisition based on the nameplate gas capacity.

The Acquisitions term of Equation DD–3 includes (pounds of each insulating gas purchased from equipment manufacturers or distributors with or inside equipment, including hermetically sealed-pressure switchgear). LADWP suggests the Disbursements term in Equation DD–3 be modified to include similar language, to clarify that gas inside equipment that is transferred to another entity for repair or salvage, in addition to equipment that is sold, counts as a disbursement. For example, the modification could read as follows: "(pounds of each insulating gas j in bulk and contained in equipment that is sold **or transferred** to other entities, **including hermetically sealed-pressure switchgear**)."

Response: See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition

Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 14

Comment Excerpt: Coalition Responses to EPA Requests for Industry Input:

Is the weight fraction of F-GHGs readily available from supplier data? Yes, the weight fraction can be determined as part of the mixing service based on the OEM's requirements for the mixture.

Are there facilities that mix gas in equipment on site, or that expect to mix gas in equipment at the facility in the future? Should EPA account for this mixing in the current equipment? As far as Coalition members are aware, GIE owners currently only source pre-mixed gas. However, while owners/suppliers of current mixed gases have not indicated any intention to do so, there may be a point in the future when GIE owners have the option to mix gases on-site. This could be a preference if, for example, there are substantial cost-savings for doing so.

Response: EPA appreciates the response to our request for industry input on these items and has taken this information into account in this final rule.

17.3 Revisions to applicability to change the nameplate capacity threshold to an emissions threshold (addition of Equations DD–1 and DD–2)

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 7

Comment Excerpt: The changes to the proposed applicability threshold also are reasonable. To calculate this threshold, EPA proposes two equations that include the nameplate capacity of applicable gas insulated equipment, an updated (and, in some instances, lower) default emissions factor, and the GWP of each insulating gas. See id. These changes to the calculation and expression of the Subpart DD reporting threshold are reasonable. However, EPA should clarify that reporters who do not believe that these changes will result in them falling below the reporting threshold or are not otherwise using F-GHGs instead of SF do not have to engage in any recalculations to demonstrate that they must report emissions under this Subpart.

Response: See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 17

Comment Excerpt: [Commenter provided feedback on the EPA's request for comment on maintaining subpart DD in Table A–3 as opposed to moving to Table A–4:

> *One option that we are considering is to move use of electrical equipment to Table A–4 of subpart A, which would require facilities that used electrical equipment but that were not electric power systems to determine applicability according to 40 CFR 98.2(a)(2). Under this option, facilities that used electrical equipment but that were not electric power systems would be required to add their total estimated F–GHG emissions from electrical equipment to their combined emissions from stationary fuel combustion units, miscellaneous uses of carbonate, and all other applicable source categories that are listed in Table A–3 and Table A–4 to determine whether the facility emits 25,000 mtCO_2e or more per year in combined emissions and whether they were required to report under part 98. In other words, if the result of this calculation exceeded 25,000 mtCO_2e, they would be required to report their emissions from electrical equipment even if the F–GHG emissions from such equipment, by themselves, were below 25,000 mtCO_2e. We are considering requiring more comprehensive reporting of emissions from users of electrical equipment other than electric power systems because comparisons between the consumption of SF_6 reported to the GHGRP by SF_6 suppliers have generally exceeded the consumption reported by (or estimated by the EPA for) SF_6 users. It is possible that SF_6 consumption by users of electrical equipment with nameplate capacities under the current threshold (and therefore with SF_6 emissions that are likely to fall under the 25,000 mtCO_2e threshold) could account for some of this gap, and therefore it is possible that reporting by these facilities would at least partially explain the gap. However, we recognize that if we move subpart DD to Table A–4, numerous facilities that are subject to this part because of emissions from another source category would potentially be newly required to report under subpart DD with only a few pieces of gas-insulated equipment. One option for addressing this concern would be not to require reporting when emissions from the facility's electrical equipment, as calculated using equation DD–2, fell below a threshold, such as 1,000 mtCO_2e. We request comment on these options. (87 FR 37007, June 21, 2022)*]

EPA introduces the potential to require reporting of fluorinated GHGs outside the electric transmission and distribution facility regardless of whether the threshold is exceeded for facilities already reporting under the GHGRP. Requiring the tracking of fluorinated GHGs would entail a significant burden, and adding such a requirement would result in a very small magnitude of additional emissions captured compared to the significant level of effort and cost required.

Response: After considering public comments on this issue, the EPA has decided not to move use of electrical equipment to Table A–4 of subpart A, which would require facilities that used electrical equipment but that were not electric power systems to determine applicability according to 40 CFR 98.2(a)(2). Thus, facilities that are not currently required to report their emissions under subpart DD and whose emissions of insulating gases, as calculated using equation DD–2, fall below 25,000 metric tons CO_2e will not be required to report those

emissions under the GHGRP. (Facilities that are currently reporting their emissions under subpart DD because they exceeded the previously applicable threshold in the past are subject to the "off-ramp" provisions at 40 CFR 98.2(i).)

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 1

Comment Excerpt: The proposed revisions would require electric power systems to calculate total annual GHG emissions for comparison to the 25,000 metric ton CO_2e (MT CO_2e) per year emission threshold and report emissions to the US EPA when exceeding that threshold. Under the emissions calculation formula required to be used for this purpose (eq DD-1), regulated entities must estimate an emissions factor of 0.1 (or 10%). While the Coalition generally supports use of an emissions factor for reasons of facility and efficiency, an estimate that each GIE will emit, on average, 10% of its gas each year is very high.

[See DCN EPA-HQ-OAR-2019-0424-0187-A1, page 2 for graph submitted by commenter.]

The above graph (created by the Coalition) demonstrates annual SF_6 emissions rate since 2011 as reported by federal mandatory reporters under the GHG Reporting Program. The underlying data was drawn from EPA's online FLIGHT tool, using the filter 'SF_6 from Electric Power Systems' and aggregating 'Total Facility Emissions' and 'Nameplate Capacity' from each individual reporter on an annual basis. The 'Emissions Rate' data above was calculated by dividing 'Total Facility Emissions' figures by 'Nameplate Capacity' for each facility. According to the graph, the reported average SF_6 emission rate started near 3% in 2011 and steadily decreased to about 1.25% in 2020. Therefore, the estimated 10% emissions rate in the draft regulation is over six times what the data reveals. The Coalition believes that an exaggerated over-estimation of the emission rate will impose an unnecessary regulatory burden on facilities whose actual emissions are much lower than the estimate. We therefore recommend that US EPA revise its emission factor to 3% rate that is closer to what the data demonstrates has been the highest annual industry average over the last 10 years.

Response: We are finalizing the 10-percent emission rate factors in Equations DD–1 and DD–2. Like the 13-percent emission rate that was implicit in the original nameplate-capacity-based threshold, the 10-percent emission rate is intended to be conservative, but not unreasonably so, capturing the majority of facilities that may have emissions greater than or equal to 25,000 $mtCO_2e$. (Note that the 10-percent emission rate represents a less conservative emission rate than the original 13-percent rate.) Experience with both the SF_6 Emission Reduction Partnership and the GHGRP has shown that facilities tend to reduce emissions after they begin reporting to EPA (Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2021, pp. 4-149 and 4-159); thus, it would not be appropriate to apply an average emission rate for reporting facilities to non-

reporting facilities. Any newly reporting facilities that have emissions below 25,000 mtCO_2e and meet the conditions of the "off-ramp" provisions at 40 CFR 98.2(i) will eventually be eligible to exit the program under those existing provisions.

17.4 Revisions to add a measurement methodology for determining nameplate capacities of new and retiring equipment

Commenter Name: Katherine Rubin
Commenter Affiliation: Los Angeles Department of Water and Power (LADWP)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0245-A1
Comment Excerpt Number: 2

Comment Excerpt: LADWP appreciates that EPA added the Nameplate Capacity Adjustment procedure to the rule, which will enable users to measure and use the actual gas capacity of the GIE in lieu of the estimated gas capacity stated on the manufacturer nameplate. A more accurate gas capacity value will enable the user to correctly report emissions. LADWP has noticed significant discrepancies between the actual gas fill of SF_6 circuit breakers (based on the full and proper charge) and the estimated nameplate gas capacity, especially for the larger, high voltage circuit breakers.

Subsection 98.303(b)(1) states "You must adopt the measured nameplate capacity value for any piece of equipment for which the absolute value of the difference between the measured nameplate capacity value and the nameplate capacity value most recently specified by the manufacturer equals or exceeds two percent of the nameplate capacity value most recently specified by the manufacturer."

Rather than a threshold based on two percent (2%) of the nameplate capacity value, LADWP recommends a difference of five pounds or more of insulating gas weight to trigger mandatory adoption of the measured nameplate capacity value and the associated requirements. For example, LADWP has SF_6 circuit breakers with voltages between 72.5 - 245 kilovolts (kV) with nameplate gas capacities ranging from 20 to 350 pounds SF_6. Two percent of 20 pounds is only 0.4 pounds, whereas two percent of 350 pounds is seven pounds. Small differences of a few pounds will not make a significant difference in the emission calculation and may not be worthwhile (in terms of administrative burden) to make the adjustment.

Response: The error propagation analyses discussed in the document "Technical Support for Proposed Revisions to Subpart DD" (2021), available in the docket for this rulemaking (Docket Id. No. EPA–HQ–OAR–2019–0424), indicated the true nameplate capacity of equipment would be expected to fall within 1.5 to 2 percent of the user-measured value based on the accuracy and precision requirements for measuring devices at 40 CFR 98.303(b)(10). Although 2 percent of the nameplate capacity of a specific piece of equipment may equal less than 5 pounds, the impact of that quantity may be significant, depending on (1) the number of pieces of equipment of the same make and model whose nameplate capacity is being measured and (2) the GWP of the associated F-GHG. For example, 4.9 pounds of SF_6 has the same ability to trap heat in Earth's atmosphere as 52 metric tons of CO_2, based on the GWP of 23,500 provided for SF_6 in AR5. For

this reason, we are finalizing our proposal that measured nameplate capacities be adopted if they differ by more than two percent from the nameplate capacity value most recently specified by the manufacturer.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 15

Comment Excerpt: Coalition Responses to EPA Requests for Industry Input:

Should the nameplate adjustment threshold be 2% of a mass? Yes, this is a reasonable threshold that takes into account the minute nature of many nameplate inaccuracies.

Response: EPA appreciates the response to our request for industry input on this item and has taken this information into account in the final rule.

Commenter Name: Katherine Rubin
Commenter Affiliation: Los Angeles Department of Water and Power (LADWP)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0245-A1
Comment Excerpt Number: 3

Comment Excerpt: With regards to the Nameplate Capacity Adjustment procedure itself, LADWP recommends the following revisions to the rule language:

1) Subsection 98.303(b)(4)(ii)(A) remove the word "covered" prior to insulating gas, since covered is not included in EPA's definition of insulating gas.

2) Subsection 98.303(b)(5)(ii) delete "Convert the initial system pressure to a temperature compensated initial system pressure by using the temperature/pressure curve for that insulating gas" and replace with "Compare the measured initial system pressure and temperature to the temperature-pressure curve specific for the equipment to confirm the equipment is at the proper operating pressure prior to recovery of the insulating gas." In addition, LADWP recommends having two options for measuring the initial gas pressure to determine whether the equipment is at the proper pressure prior to recovery of the gas.

a. Option 1: use external pressure and temperature gauges as described in 98.303(b)(5)(i).

b. Option 2: most non-hermetically sealed circuit breakers have an integrated temperature-compensated gas pressure gauge attached directly to the gas vessel. If the integrated gauge was used for the initial gas fill and to monitor and maintain the gas at the proper operating pressure over the service life of the circuit breaker, it makes sense to use this same gauge to determine whether the circuit breaker is at the proper operating pressure prior to the Nameplate Capacity Adjustment procedure.

3) Subsection 98.303(b)(5)(iv): when doing complete recovery of the insulating gas from equipment, use of a mass flow meter to measure the insulating gas recovered is not recommended since a mass flow meter does not accurately measure gas at low flow rates. The gas container weighing method should be used to accurately measure the total weight of insulating gas recovered from the equipment.

4) Subsection 98.303(b)(10) please revisit whether the term "precise" is appropriate to include in the accuracy specifications for gauges, flow meters and weigh scales. A general search of specifications for pressure and temperature gauges, mass flow meters and cylinder weigh scales state the device accuracy but make no mention of precision, so it may be difficult to find measurement devices that are "certified by the manufacturer to be accurate and precise."

Response: See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 7

Comment Excerpt: § 98.303(b)(5)(ii) ~~Convert the initial system pressure to a temperature-compensated initial system pressure by using the temperature/pressure curve for that insulating gas.~~ Using an accurate pressure gauge, measure the initial system pressure and the vessel temperature prior to removal of any insulating gas, and compare the pressure to the equipment manufacturer's temperature/pressure curve designed specifically for the GIE being measured.

The proposed language states that the temperature/pressure curve is used to "convert" initial system pressure to a temperature-compensated pressure. The curve is not to perform a conversion. It is to reference the expected pressure and confirm density based on the temperature of the gas and GIE.

Response: See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 6

Comment Excerpt: The Coalition supports the proposed inclusion of a process for GIE users to adjust nameplate values to more accurately reflect mass when the GIE is charged to full and proper density. In order to clarify and correct some of the provisions, we offer the following:

§ 98.303(b)(4)(iii)(B) Connect a mass flow meter between the electrical equipment and a gas cart. Transfer gas to the equipment to reach the temperature-compensated design operating pressure per manufacturer specifications. During gas transfer ensure that the minimum gas flow, per the gas flow meter manufacturer's instructions, is maintained through the flow meter. Close the connection to the GIE from the mass flow meter hose and ensure that the gas trapped in the filling hose returns through the mass flow meter. Calculate the amount of gas transferred from the mass reading on the mass flow meter or through use of an in-calibration cylinder scale.

Mass flow meters can be used provided they are properly configured for the application. To ensure proper configuration, the maximum & minimum flow rates of the meter, as well as the displacement of the pumps & compressors on the gas cart being used must be taken into consideration. Generally speaking, mass flow meters designed for high flow applications will not be suitable for low flow conditions and meters designed for low flow applications will not be suitable for high flow conditions.

The Coalition also recommend allowing an in-calibration cylinder scale as an option for accountability of the gas transferred as some users may find this approach preferable.

Response: See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 8

Comment Excerpt: § 98.303(b)(5)(iii)

If the temperature-compensated initial system pressure of the electrical equipment does not match the temperature-compensated design operating pressure specified by the equipment manufacturer, you may either:

(A) Add or remove insulating gas to/ from the electrical equipment until the manufacturer-specified value is reached, or

(B) If the temperature-compensated initial system pressure of the electrical equipment is no less than 90 percent of the temperature compensated design operating pressure specified by the manufacturer (in absolute terms), use Equation DD–4 to calculate the nameplate capacity based on the mass recorded under paragraph (b)(5)(vi) of this section.

~~(iv) Follow one of the following processes, depending on the methodology being used to measure the amount of gas recovered:~~

~~(A) Connect a mass flow meter between the electrical equipment and a gas cart; or~~

(iv) Weigh the gas container being used to receive the gas and record this value.

…

(vi) Record the amount of insulating gas recovered (pounds), ~~either based on the reading from the mass flow meter, or~~ by weighing the gas container that received the gas and subtracting the weight recorded pursuant to paragraph (b)(5)(iv)(B) of this section from this value. Account for any gas contained in hoses before and after the transfer. The amount of gas recovered shall be the measured nameplate capacity for the electrical equipment unless recovery of 99.1% has not been achieved ~~the final temperature-compensated pressure of the electrical equipment exceeds 0.068 psia (3.5 Torr)~~ or the electrical equipment user is calculating the nameplate capacity pursuant to paragraph (b)(5)(iii)(B) of this section, in which cases the measured nameplate capacity shall be the result of Equation DD–4.

The Coalition recommends that the language referring to use of a mass flow meter be removed from this section due to the potential for errors when a mass flow meter is used in this process. For example, a mass flow meter may require that >0.8 kg/hr. (1.7lbs/hr.) of continuous gas flow must be maintained to ensure the meter manufacturer's stated accuracy. Because the GIE will be 100% recovered (all insulating gas removed) and subsequently brought to a blank-off pressure, the mass flow meter may not be able to accurately account for any gas that flows through its measuring device at less than the stated gas flow rate. The process of weighing all gas removed from a GIE and transferred into a cylinder includes weighing all the gas trapped in hoses and in gas cart, which would not be accounted for by the flow meter. The gas (*i.e.*, trapped in hoses and in the gas cart) would need to be moved into cylinders to be accurately weighed with a cylinder scale. The Coalition also recommends removing the reference to 3.5 Torr.

Response: See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 10

Comment Excerpt: In several subsections of the proposed regulation, US EPA requires that measurement devices be precise as well as accurate.

"When speaking about the accuracy of a measurement, you are referring to the data's correctness. This means that an accurate instrument would provide measurements closest to the actual value or standard. Precision, on the other hand, is the ability of a device to provide you with consecutive measurements that are close to one another. An instrument can give extremely precise measurements that are not at all correct. Precision is directly related to the repeatability and reproducibility of your measurements."[3]

We recommend that the requirement for precision be removed since there is a much greater importance for accurate measurements than for repeatable measurements. Precision has little value if the measurements performed are not accurate.

Footnotes

[3] Metrology Terminology - Accuracy, Precision, Resolution: https://www.crossco.com/resources/articles/metrology-terminology-accuracy-precision-resolution/

Response: See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 5

Comment Excerpt: In 40 CFR 98.303(b)(5) US EPA is proposing to allow equipment users to account for gas leakage using one of two approaches. Both approaches involve removing gas from the gas insulated equipment (GIE) until reaching a pressure of 3.5 Torr. Not all facilities own gas carts capable of reaching 3.5 Torr, and, for some GIE, that level of pressure is not necessary in order for an accurate reading. We recommend that the GIE recovery is performed to

allow for 99.1% or greater recovery of the insulating gas. This would allow users to determine their preferred methodology and equipment for gas recovery.

Response: See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 17

Comment Excerpt: Coalition Responses to EPA Requests for Industry Input:

Are there alternative methods for addressing nameplate capacity measurements for equipment with large leaks? Yes, there are alternative methods. A process exists where nameplate capacity measurement for equipment with large leaks can be completed, including achieving a 99.1% or greater gas recovery. This requires a specific process that avoids cross contamination of 86% or greater of the gas.

What is the appropriate minimum temperature equilibrium time following the gas filling procedure? We recommend 24 hours minimum temperature equilibrium time to allow the gas to condition itself to its container in order to confirm the correct density has been met. Additionally, we recommend 24 hours of wait time before analysis of gas in the GIE to determine its state.

Is it sufficient to require that any gas inside hoses be "accounted for" both before and after equipment filling or emptying processes, or should US EPA specify a more detailed procedure for evacuating hoses before and after equipment filling and emptying? Yes, it is sufficient for US EPA to require that any gas inside hoses be "accounted for" both before and after equipment filling or emptying processes. However, we recommend that US EPA establish a minimum recovery threshold of 99% gas recovery by calculating the difference between the pre-fill and post-fill absolute pressures, respectively, and dividing that sum by the pre-fill absolute pressure.

Response: Regarding alternative methods for addressing nameplate capacity measurements for equipment with large leaks, the commenter did not identify or describe these methods and therefore EPA did not have enough information to include consideration of such methods in this final rule.

Regarding whether it is sufficient to require that any gas inside hoses be accounted for both before and after equipment filling or emptying processes, the EPA is finalizing the proposed requirement that such gas be accounted for. See section III.Q.2 of the preamble for EPA's response to the commenter's recommendation that the EPA require recovery of 99% of the insulating gas during the nameplate capacity measurement.

Regarding the temperature equilibration time, see section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Regarding the recommended 24 hours of wait time before analysis of gas in the GIE to determine its state, this is not directly relevant to the nameplate capacity measurement and we are therefore not taking action on this recommendation in this final rule.

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 2

Comment Excerpt: EPA should not require that all reporters measure all newly installed gas insulated equipment to determine if there are discrepancies between the nameplate capacity and the capacity that could be measured in the field. Owners and operators of facilities that report under Subpart DD should have the option to use the nameplate capacity if they choose, as long as they make that choice consistently for all equipment and otherwise follow the requirements for measuring and reporting emissions using the mass balance equation.

Response: We did not propose to require all reporters to measure the nameplate capacity all newly installed gas insulated equipment, and we are not finalizing such a requirement. To clarify, in 40 CFR 98.303(b) we proposed to require users of electrical equipment to follow certain procedures when they *elect* to measure the nameplate capacities (in units of mass of insulating gas) of new and retiring equipment rather than relying on the rated nameplate capacities provided by equipment manufacturers. This option is available only for closed-pressure equipment with a voltage capacity greater than 38 kV, not for hermetically sealed pressure equipment or smaller closed-pressure equipment. To avoid biases that could result from measuring and adopting nameplate capacities for some pieces of eligible new or retiring equipment but not others, electrical equipment users electing to measure the nameplate capacities of any new or retiring equipment will be required at 40 CFR 98.303(b)(1) to measure the nameplate capacities of all eligible new and retiring equipment in that year and in all subsequent years.

17.5 Revisions to reporting and recordkeeping (40 CFR 98.306 and 40 CFR 98.307) for equipment for which the nameplate capacity is measured

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Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 4

Comment Excerpt: Revised § 98.305(q) and § 98.456(u) both require the reporting of an ID number or other appropriate descriptor for each unique insulating gas. Gases mixed onsite will not have an ID number assigned by the supplier, so we assume the US EPA is referring to an ID number that is assigned by the user. If so, this should be clearly stated. Accordingly, the Coalition recommends the following revisions:

For ~~each unique~~ any insulating gas reported in paragraphs…of this section, an ID number assigned by the electric power system, or other appropriate descriptor that is unique to the reported insulating gas.

For each ID number or descriptor reported in paragraph…of this section, ~~for each unique insulating gas,~~ the name (as required in § 98.3(c)(4)(iii)(G)(1)) and weight percent of each gas in the insulating gas.

Response: In the final rule, the EPA is implementing the commenter's recommendation to clarify that the ID number or other appropriate descriptor must be unique to the reportable insulating gas. The goal of the ID numbers and descriptors is to allow the reporter and EPA to identify the name(s) and weight percent(s) of each fluorinated gas of each insulating gas reported, for both individual F-GHGs and F-GHG mixtures. We are finalizing the proposed language "an ID number or other appropriate descriptor" without the modifier "assigned by the electric power system" because the modifier could be assigned by the gas producer, distributor, or electric power system.

17.6 Comments on proposed definitions (40 CFR 98.308)

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 3

Comment Excerpt: Insulating Gases Should be Defined as Gases with a GWP > 1. The proposed revisions would require reporters to track and report emissions of any fluorinated greenhouse gas or gas mixture used as an insulating gas or arc quenching gas in electrical systems. This definition ignores other potential gases that may come onto the market that are not fluorinated but still have a GWP potential. In order to track emissions of these gases, we recommend revising the definition of 'insulating gas' as follows: "Any gas with a global warming potential greater than 1 used as an insulating gas and/or arc quenching gas in electrical equipment." This approach also mirrors the reporting threshold implemented by the California Air Resources Board (CARB). Aligning the federal definition with state regulations would provide consistency for reporters to both the federal and state reporting rules[2].

Footnotes

[2] If EPA changes the proposed definition of 'insulating gas' to mirror the definition used by CARB then there is no need to update Table A–1 by adding Novec™ 5110, because Novec™ 5110 has a GWP < 1.

Response: See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 17

Comment Excerpt: Duke Energy supports the proposed revision to the definition of "energized" for equipment assets that are included in the inventory of SF_6-containing components. The overall methodology for estimating annual emissions of SF_6 under Subpart DD appears relatively straightforward—it is based on a simple accounting of SF_6 inventories purchased, used, and returned to suppliers and an accounting of the SF_6 that is contained in electrical components. However, the actual implementation has been subject to significant year-to-year variation in inventories that goes beyond any expectation that all reported changes are representative of actual releases to the environment. In Duke Energy's experience, one significant source of error appears to be the accounting for SF_6 that is attributed to equipment that has been installed at substation locations under construction or modification but has not yet been energized and tied into the electric transmission network, pending completion of the project. The change in the definition of "energized" equipment to provide for accounting of equipment "that is fully-charged, ready for service, and being prepared for connection to the electrical power system" will provide a more accurate accounting of how much SF_6. Is stored in equipment. [40 C.F.R. § 98.308]

Response: EPA acknowledges the commenter's support of the proposed revision to the definition of "energized" and the associated estimation methodologies. We agree that the revised definition will provide further clarity for reporters and improve the accuracy and completeness of each yearly report. See also response to comment EPA-HQ-OAR-2019-0424-0187-A1, Excerpt 16.

Commenter Name: Katherine Rubin
Commenter Affiliation: Los Angeles Department of Water and Power (LADWP)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0245-A1
Comment Excerpt Number: 5

Comment Excerpt: The term "energized" has a specific meaning within the electric utility industry that differs from EPA's proposed definition of equipment that is connected to (or being prepared for connection to) the electrical power system. To avoid confusion from this term having two different meanings, LADWP recommends replacing the term "energized" with "active" to be consistent with the term used in CARB's regulation.

Response: We are retaining the term "energized," which has been included in the mass-balance equation (now equation DD–4) previously. We note that other commenters supported the proposed definition of "energized." See also response to comment EPA-HQ-OAR-2019-0424-0187-A1, Excerpt 16.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 16

Comment Excerpt: Coalition Responses to EPA Requests for Industry Input:

Is new equipment typically filled with gas in the same year that it is energized? Not always. The frequency of this scenario varies based on the user. Some utilities, particularly larger ones, often fill GIE in the calendar year prior due to project delays and other contingencies. On this topic, the Coalition notes inclusion of a definition for the term 'Energized' which establishes parameters for when equipment must be reported. We understand this term to include equipment that is fully charged with insulating gas and being prepared for connection (though not yet connected to) the electric power system. We understand this approach to be consistent with CARB's approach for determining when equipment must be reported. It is important that the Federal and CARB approaches align in this regard to reduce regulatory burden on reporters for both jurisdictions.

Is retiring equipment typically emptied of gas during the same year that it ceases to be energized? Not always. Facilities may remove and make inactive GIE, leaving gas in the GIE for several months, if not longer. This scenario may occur if the GIE is waiting to be decommissioned. Depending on timing, the "waiting" period could touch two calendar years.

Response: EPA appreciates the response to our request for industry input on these items. The new definitions of "energized," "new equipment," and "retiring equipment" largely address the situations described by the commenter. In addition, the EPA is clarifying in Equation DD–4 (Mass-Balance Equation) that reportable insulating gas inside equipment that is not energized is considered to be "stored in containers." Together, these revisions to subpart DD should help to ensure that the nameplate capacities and contents of both energized and non-energized equipment are properly reflected in Equation DD–4.

Commenter Name: Katherine Rubin
Commenter Affiliation: Los Angeles Department of Water and Power (LADWP)
Commenter Type: State Government/Regulatory Agency
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0245-A1
Comment Excerpt Number: 4

Comment Excerpt: LADWP recommends revisiting the assumptions behind the proposed definitions of "new" and "retired" equipment:

- Is new equipment typically filled with gas in the same year that it is energized?

Sometimes but not always. The timing of gas filling and energizing of a new GIE depends on the circumstances, including whether the GIE is at a new substation under construction (longer timeline), or replacing a GIE at an existing substation (shorter timeline that depends on the scheduled outage). Commissioning a new GIE is a multi-step process. After the GIE is filled, a series of tests are performed to ensure the GIE will operate correctly. If the GIE is filled with gas in December, the testing may extend into January of the following year. If the GIE fails the testing, the gas must be removed and the GIE sent to the manufacturer for repair. Another example is a standby spare GIE located at a critical substation that is filled with gas but not energized until it is needed, which could be years in the future. Another example is training where a spare GIE is filled with gas, then the gas is recovered for training purposes, but the GIE is never energized.

- Is retiring equipment typically emptied of gas during the same year that it ceases to be energized?

Sometimes but not always. The timing of gas recovery from a GIE also depends on the circumstances. If a circuit breaker position is taken out-of-service, the deenergized GIE may be left in place with the gas inside for several months or longer, until a crew with a gas cart has time to recover the gas. If a circuit breaker in an active position is being replaced, the gas would be recovered promptly so the old breaker can be removed and the new breaker installed, filled and tested.

In addition, LADWP recommends that the definitions of "new" and "retired" equipment be tied to the filling and removal of insulating gas, since the mass-balance approach to calculating emissions must account for the movement of gas between GIE and gas containers, which does not always coincide with the GIE being energized or deenergized. The definition of "retired" equipment should also include fully-charged switches and hermetically sealed equipment that is sent to the manufacturer for repair or to a vendor for salvage, in addition to equipment that is sold to another entity.

Response: See response to comment EPA-HQ-OAR-2019-0424-0187-A1, Excerpt 16.

18.0 Comments on Subpart GG of Part 98

Commenter Name: Audrey Lumpkin
Commenter Affiliation:

Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0175-A1
Comment Excerpt Number: 2
Supportive Commenters: 0175 is coded as 0175-A1

Comment Excerpt: Zinc is an essential nutrient that is vital for DNA creation, cellular growth, protein synthesis, and immune support among many other functions. The EPA proposed to report the total amount of electric arc furnace (EAF) dust, however the dust is typically associated with CO_2 emissions (Omran et al., 2019). The addition of this requirement would provide essential data to help mitigate environmental waste and promote conservation of resources. However, how would the zinc be capable of recovery post usage? Does the removal of zinc from EAF dust uphold proper chemical standards for human usage or would it need further decontamination techniques? The process of removing zinc from the dust is also energetically expensive, thus is there a way to mitigate zinc waste in EAF dust or is recycling of the mineral the best option?

Response: The EPA acknowledges the commenter's input, as well as the included journal article concerning selective zinc removal using microwave heating. Subpart GG – Zinc Production of the Greenhouse Gas Reporting Program (GHGRP) is a mandatory greenhouse gas (GHG) reporting program for certain zinc production facilities. As a data reporting rule, subpart GG does not mandate specific zinc production or recycling methodologies and does not regulate the usage of produced zinc. As such, this comment is outside the scope of this rulemaking.

Commenter Name: Audrey Lumpkin
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0175-A1
Comment Excerpt Number: 1

Comment Excerpt: The commenter provided a copy of the journal article, "Selective Zinc Removal from Electric Arc Furnace (EAF) Dust by Using Microwave Heating," Omran, Mamdouh, Fabritius, Timo, and Heikkinen**,** Eetu-Pekka. Journal of Sustainable Metallurgy, https://doi.org/10.1007/s40831-019-00222-0. This study aimed to investigate the selective zinc removal from EAF dust by means of microwave heating oven as a heat source. The study indicated that EAF dusts are good microwave absorbers owing to the contents of carbon and iron oxides and that a temperature of 950 °C is suitable for selective removal of zinc from EAF dust. Therefore, Zn is recovered as a valuable element, and the remaining solid residue can be reused in steelmaking processes. Moreover, the results revealed that significant reductions in the contents of lead, chloride, and alkaline elements are observed after microwave heating."

References

Omran, M., Fabritius, T. & Heikkinen, EP. Selective Zinc Removal from Electric Arc Furnace (EAF) Dust by Using Microwave Heating. J. Sustain. Metall. 5, 331–340 (2019). https://doi.org/10.1007/s40831-019-00222-0.

Response: See response to comment EPA-HQ-OAR-2019-0424-0175-A1, Excerpt 1.

19.0 Comments on Subpart HH of Part 98

19.1 General Comments on Revisions to subpart HH (Municipal Solid Waste Landfills)

Commenter Name: Prof. Nickolas J. Themelis
Commenter Affiliation: Earth Engineering Center, Columbia University
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0228-A1
Comment Excerpt Number: 3

Comment Excerpt: The major problem in the EPA estimate of methane emission from U.S. landfills (114 million metric tons of CO_2 equivalent; https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks) is that the tonnage of MSW landfilled in 2018 is grossly underestimated by EPA, at **146.1** million short tons (132.8 million metric tons; (https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling). However, Themelis and Bourtsalas (Journal of Environmental Science and Engineering A 10, p.199-206; 2021) conducted a study of the 1,164 U.S. operating landfills, using the data provided by the landfill operators to the government. Analysis of the 2018 data showed that in fact **348** million short tons (316 million metric tons) were disposed in MSW landfills. This number is 138% higher than the EPA estimate of 146.1 million short tons and results in the underestimate of methane emissions of U.S. landfills.

Also, the Columbia University study of U.S. operating landfills ((Themelis and Bourtsalas, Journal of Environmental Science and Engineering A 10, p.199-206; 2021) showed that, after subtraction of methane captured by landfills in EPA's Landfill Methane Outreach Program (LMOP: 5.1 million short tons of methane), the U.S. operating landfills in 2018 emitted 11.9 million short tons of methane. On a 100-year horizon, the MSW landfill emissions were equivalent to 270 million metric tons of carbon dioxide, *i.e.*, 85% higher than the EPA estimate.

Response: The EPA reviewed the article cited by the commenter and disagrees that annual disposal rates estimated from LMOP waste-in-place values are more accurate than direct measurement of the quantity of waste disposed in a given year. We note that LMOP is a voluntary program and there are no direct methods by which LMOP's waste-in-place numbers must be estimated.

The LMOP database does not include data for every MSW landfill in the United States. Data received for inclusion in the LMOP database are reviewed for reasonableness and are corroborated via other data sources when possible. Not all data are updated each year. While the Program strives to keep the information as updated and accurate as possible, the database is not exhaustive.

Second, the commenter cites the EPA's Facts and Figures report for the low estimate of waste quantities. The EPA's Facts and Figures focuses on MSW and many MSW landfills dispose of other wastes in addition to MSW, such as construction and demolition (C&D) wastes. As such the quantity of waste disposed of in landfills is higher than the quantity of MSW in landfills as estimated in the Facts and Figures report.

In the 2018 reporting year, the total quantity of waste disposed of in landfills required to report under subpart HH was just over 320-million metric tons. This value agrees well with the value suggested to be accurate by the commenter, but since not all landfills are required to report to subpart HH, the actual waste disposal rates nationwide are somewhat higher than that suggested by the commenter. We similarly find that the study authors appear to assume the full quantity of waste disposed of in landfills was MSW (rather than a mixture of MSW and other wastes) so the study authors tended to over-estimate the methane generation potential of the waste disposed. We also find that the methods used to determine methane recovery in subpart HH are more defined compared to the assumptions needed to estimate landfill gas recovery from LMOP reported data. While we appreciate the commenter's input, the EPA will not be making any revisions to subpart HH as a result of this comment.

Commenter Name: John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele
Commenter Affiliation: RMI
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0234-A1
Comment Excerpt Number: 1

Comment Excerpt: Recent advances in methane detection technologies have improved our ability to observe and quantify methane emissions from individual landfills.[7] Multiple studies find little correlation between top-down observations and bottom-up emissions calculated under the Subpart HH equations. In some cases, observed emission rates are orders of magnitude higher than those reported under GHGRP, at least in part reflecting variable large emission events that bottom-up models fail to capture.[8]

The Next Generation Airborne Visible/Infrared Imaging Spectrometer (AVIRIS-NG) is one example of airborne instrument technology that can remotely sense methane emissions with high spatial resolution from individual sources.[9] Top-down observations can be used to derive emission rates that can be compared to greenhouse gas inventories, although there are some limitations in sensitivity that we discuss further in Section III.

For example, the California Methane Survey flew AVIRIS-NG, mounted on an aircraft, over 270 landfills and 166 organic waste facilities repeatedly during 2016-18 to quantify their contribution to the state methane budget.[10] The survey found methane "super-emitter" activity in every surveyed sector including waste, where a few point sources had an outsized impact on overall emissions (*e.g.*, 10% of sources represented nearly 60% of emissions). Specifically, 30 landfills and 2 composting facilities were the largest methane point source emitters in the state (43% of

total emissions in the study), exhibiting persistent, potentially anomalous activity that was not adequately accounted for in state or national inventories.[11] Across six representative California landfills in the survey, four had reported emission rates to the GHGRP that were well below AVIRIS-NG and other aircraft-based observations, while two landfills reported emissions slightly higher than observed (Figure 1).[12] [See DCN EPA-HQ-OAR-2019-0424-0234-A1 for Figure 1: California Methane Survey: Measured vs. Reported Emission for Representative Landfills[13]]

Site-level aerial data can drive design and operational improvements at high-emitting landfills. For example, following the initial flyovers, Sunshine Canyon landfill updated its covers, collection pipes, and well design, contributing to a 55-60% reduction in methane emissions as corroborated by follow-up AVIRIS-NG flights and records of the LFG collection volumes.[14]

Beyond California, emission rates observed by AVIRIS-NG show little correlation with those reported under GHGRP. Figure 2 compares observed and modeled emissions at select landfills in Arizona, California, Colorado, Louisiana, New York, Ohio, Pennsylvania, and Utah between 2016 and 2021. About half of the sampled landfills had observed emissions higher than those reported under GHGRP across multiple revisits, and on a weighted average, the airborne surveys in the study estimated emissions 3.5 times higher than the bottom-up estimates.[15] Furthermore, AVIRIS-NG estimates capture point source emissions (*i.e.*, emissions from an area typically less than 10 meters in scale), not area sources (*i.e.*, emissions from a diffuse area), and are therefore generally conservative when estimating total annual emissions from a landfill.

[See DCN EPA-HQ-OAR-2019-0424-0234-A1 for Figure 2: Comparison of Methane Emissions Estimates from Bottom-Up Inventories and Top-Down Aerial Surveys[16]]

Other studies in Maryland, Texas, and Indiana found large discrepancies between modeled and observed methane emissions at landfills. In Maryland, the methane emission rates observed during 48 mass balance aircraft flights over eleven landfills were about 1.8 times higher on average than emission rates reported to GHGRP. One Maryland landfill had observed emissions 9 times higher than GHGRP.[17] In Texas, aircraft-based observations of methane emissions during five flights at three landfills were about 2.8 times higher than reported GHGRP values.[18] At a central Indiana landfill, emissions reported to GHGRP (based on equation HH–8) between 2010 and 2014 fell generally below aircraft-based measurements, and at or below the lower 10% percentile of other direct measurement techniques at the landfill over the same period.[19]

The substantial body of top-down and direct measurement data shows significant discrepancies between top-down and bottom-up emissions estimates and that landfill emissions as reported under the GHGRP do not adequately reflect landfill emissions estimates, which could significantly impact both the waste sector's contribution to the methane budget and the availability of accurate public information about the environmental impacts of individual facilities.

Footnotes

[7] Daniel H Cusworth et al. (2020) Using remote sensing to detect, validate, and quantify methane emissions from California solid waste operations. Environmental Research Letters, 15(5). https://iopscience.iop.org/article/10.1088/1748-9326/ab7b99; The White House Office of Domestic Climate Policy. (2021, November). U.S Methane Emissions Reduction Action Plan.

https://www.whitehouse.gov/wp-content/uploads/2021/11/US-Methane-Emissions-Reduction-Action-Plan-1.pdf

[8] Hamid R Amini et al. (2013) Comparison of first-order-decay modeled and actual field measured municipal solid waste landfill methane data. Waste Manag., 3(12): 2720-8. https://pubmed.ncbi.nlm.nih.gov/23988298/; Riley M Duren et al. (2019). California's methane super-emitters. Nature, 575: 180-184. https://doi.org/10.1038/s41586-019-1720-3.

[9] Daniel H Cusworth et al. (2020) Using remote sensing to detect, validate, and quantify methane emissions from California solid waste operations. Environmental Research Letters, 15(5). https://iopscience.iop.org/article/10.1088/1748-9326/ab7b99

[10] California Energy Commission: Energy Research and Development Division (2020, July). Final Project Report: The California Methane Survey. https://www.energy.ca.gov/sites/default/files/2021-05/CEC-500-2020-047.pdf

[11] Id.

[12] Id.

[13] California Energy Commission: Energy Research and Development Division (2020, July). Final Project Report: The California Methane Survey, 37. https://www.energy.ca.gov/sites/default/files/2021-05/CEC-500-2020-047.pdf

[14] Daniel H Cusworth et al. (2020) Using remote sensing to detect, validate, and quantify methane emissions from California solid waste operations. Environmental Research Letters, 15(5). https://iopscience.iop.org/article/10.1088/1748-9326/ab7b99; Tseng, Eugene (2020, November), When Viewed From Space. https://www.mswmanagement.com/landfills/odor-dust-control/article/21157296/when-viewed-from-space.

[15] RMI, Carbon Mapper, IG3IS. (2022, July). Key Strategies for Mitigating Methane Emissions from Municipal Solid Waste. https://rmi.org/insight/mitigating-methane-emissions-from-municipal-solid-waste/.

[16] Carbon Mapper. Methane, CO_2 Data, Global Open Portal, Carbon Mapper., accessed June 2, 2022, https://carbonmapper.org/data/.

[17] Xinrong Ren et al. (2018). Methane emissions from the Baltimore-Washington area based on airborne observations: Comparison to emissions inventories. J. Geophys. Res.-Atmos, 123(16): 8869-8882. https://doi.org/10.1029/2018JD028851

[18] Lavoie et al. (2015). Aircraft-Based Measurements of Point Source Methane Emissions in the Barnett Shale Basin. Environmental Science & Technology, 49 (13): 7904-7913. https://pubs.acs.org/doi/10.1021/acs.est.5b00410

[19] Cambaliza et al. (2017). Field measurements and modeling to resolve m2 to km2 CH_4 emissions for a complex urban source: An Indiana landfill study. Elementa: Science of the Anthropocene, 5(36). https://doi.org/10.1525/elementa.145.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 71

Comment Excerpt: Recent advances in methane detection technologies have improved our ability to observe and quantify methane emissions from individual landfills.[148] Multiple studies find little correlation between top-down observations and emissions calculated under the subpart HH equations. In some cases, observed emission rates are orders of magnitude higher than those reported under GHGRP, at least in part reflecting variable large emission events that bottom-up models fail to capture.[149]

The Next Generation Airborne Visible/Infrared Imaging Spectrometer (AVIRIS-NG) is one example of airborne instrument technology that can remotely sense methane emissions with high spatial resolution from individual sources.[150] Top-down observations can then be used to derive annual emission rates that can be incorporated into greenhouse gas estimates, although there are some limitations in sensitivity and measurement frequency that we discuss further below.

For example, the California Methane Survey flew AVIRIS-NG, mounted on an aircraft, over 270 landfills and 166 organic waste facilities repeatedly during 2016 through 2018 to quantify their contribution to the state methane budget.[151] The survey found methane "super-emitter" activity in every surveyed sector, where a few point sources had an outsized impact on overall emissions (*e.g.*, 10% of sources represented 60% of emissions). Specifically, 30 landfills and 2 composting facilities were the largest methane point source emitters in the state by sector (43% of the total emissions in the study), exhibiting persistent, potentially anomalous activity that was not adequately accounted for in state or national inventories.[152] Across six representative California landfills in the survey, four had reported emissions to the GHGRP that were well below AVIRIS-NG and other aircraft-based observations, while two landfills reported emissions slightly higher than observed (Figure 6).[153]

[See DCN EPA-HQ-OAR-2019-0424-0241-A1, pg. 56, for Figure 6: Measured vs. Reported Emissions at Six California Landfills]

Site-level aerial data can drive design and operational improvements at high-emitting landfills. For example, following the initial flyovers, Sunshine Canyon landfill updated its covers, collection pipes, and well design, contributing to a 55-60% reduction in methane emissions as corroborated by follow-up AVIRIS-NG flights.[154]

Beyond California, emissions observed by AVIRIS-NG show little correlation with those reported under GHGRP. Figure 7 compares observed and modeled emissions at select landfills in Arizona, California, Colorado, Louisiana, New York, Ohio, Pennsylvania, and Utah between 2016 and 2021. About half of the sampled landfills had observed emissions higher than those reported under GHGRP across multiple revisits, and on a weighted average, airborne surveys estimated emissions 3.5 times higher than the bottom-up estimates in the study.[155] Furthermore, AVIRIS-NG estimates capture point source emissions (*i.e.*, emissions from an area typically less than 10 meters with an emission rate above ~50 kg/h CH_4) and are therefore generally conservative, likely underestimating total annual emissions from sources such as landfills that often have diffuse emissions spread over a larger area.

[See DCN EPA-HQ-OAR-2019-0424-0241-A1, pg. 57, for Figure 7: Comparison of Methane Emissions Estimates from Bottom-Up Inventories and Top-Down Aerial Surveys][156]

Additional studies in Maryland, Texas, and Indiana found large discrepancies between modeled and observed methane emissions at landfills. In Maryland, the methane emission rates observed during 48 mass balance aircraft flights over eleven landfills were about 1.8 times higher than emission rates reported to GHGRP. One Maryland landfill had observed emissions 9 times higher than were reported to GHGRP.[157] In Texas, aircraft-based observations of methane emissions at three landfills were about 2.8 times higher than reported GHGRP values.[158] At a central Indiana landfill, emissions reported to GHGRP (based on equation HH–8) between 2010 and 2014 fell generally below aircraft-based measurements, and at or below the lower 10% percentile of observations from other direct measurement techniques at the landfill over the same period.[159]

Footnotes

[148] Cusworth et al., Using Remote Sensing to Detect, Validate, and Quantify Methane Emissions from California Solid Waste Operations, 15 Env. Res. Letters 054012 (2020), https:/Aopscience.iop.org/article/10.1088/1748-9326/ab7b99; White House Office of Domestic Climate Policy, U.S. Methane Emissions Reduction Action Plan (2021) www.whitehouse.gov/wp-content/uploads/202 1/1 1/US-Methane-Emissions-Reduction-Action-Plan-1.pdf.

[149] See, *e.g.*, Amini et al., Comparison of First-order-decay Modeled and Actual Field Measured Municipal Solid Waste Landfill Methane Data. Waste Manag. 2013 Dec; 33(12):2720-8. https://pubmed.ncbi.nlm.nih.gov/23988298/; Duren, et al., California's Methane Super-emitters. Nature 575, 180—184](2019), https://doi.org/10.1038/s41586-019-1720-3.

[150] Cusworth et al., Using Remote Sensing, supra note 148.

[151] Id.; The California Methane Survey (2020), https://www.energy.ca.gov/sites/default/files/202 1-05/CEC-500-2020-047.pdf.

[152] Id.

[153] Id.

[154] Cusworth et al., Using Remote Sensing, supra note 148; Eugene Tseng, When View From Space, Nov. 2020, https://www.mswmanagement.com/landfills/odor-dust-control/article/2 1 157296/when-viewed-from-space.

[155] RMI, Carbon Mapper, IG3IS "Key Strategies for Mitigating Methane Emissions from Municipal Solid Waste," July 2022; Carbon Mapper, "Methane, CO_2 Data, Global Open Portal, Carbon Mapper" (last accessed June 2, 2022), https://carbonmapper.org/data/.

[156] Carbon Mapper, Methane, CO_2 Data, Global Open Portal, Carbon Mapper (last accessed June 2, 2022), https://carbonmapper.org/data/.

[157] Ren et al., Methane Emissions from the Baltimore-Washington Area Based on Airborne Observations: Comparison to Emissions Inventories, J. Geophys. Res.-Atmos. 123, 8869-8882 (2018), https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2018JD028851.

[158] Lavoie et al., Aircraft-Based Measurements of Point Source Methane Emissions in the Barnett Shale Basin, Environ. Sci. Technol. 2015, 49, 13, 7904-7913 (2015), https://doi.org/10.1021/acs.est.5b00410.

[159] Cambaliza et al., Field Measurements and Modeling to Resolve M2 to Km2 CH_4 Emissions for a Complex Urban Source: An Indiana Landfill Study, Elementa: Science of the Anthropocene (2017), https://do.org/10.1525/elementa.145.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele
Commenter Affiliation: RMI
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0234-A1
Comment Excerpt Number: 7

Comment Excerpt: Advanced methane detection technologies offer a promising pathway to more frequent and cost-effective methane monitoring that can serve as a critical check on the bottom-up equations. In this section, we discuss the costs and availability of advanced monitoring technologies and recommend that EPA require monitoring and reporting with these technologies for a subset of large landfills, as defined by EPA.

Advanced methane monitoring technologies are already widely available and in use across the oil and gas sector, as well as by some leading landfill operators.[52] Many of these technologies are highly effective and inexpensive. These technologies are particularly capable and efficient at screening broad geographic areas for emissions to detect large, potentially intermittent emission sources. Layered approaches utilizing multiple techniques may be required in some cases to pinpoint sources of smaller leaks. Many companies providing advanced methane mitigation services are domestic and provide well-paying jobs in geographies across the country.

A recent comprehensive survey from Datu Research shows that advanced leak detection services are widely-available for the oil and gas sector. Many of these same companies and technologies can be deployed for landfills, and firms offering advanced methane monitoring are poised to scale up in coming years under the upcoming oil and gas regulations.[53] Firms offering advanced monitoring services have nearly doubled in the past four years alone and operate in regions across the country. Nearly half of firms surveyed (47%) said they could scale up significantly in the coming years; these respondents comprised those using fixed sensors, airplanes, satellites, or a combination of these technologies. Eighty-nine percent of the firms surveyed can detect emissions at the site level, while 53% can pinpoint smaller leak sources. Datu's findings underscore that advanced methane detection technologies are already widely available and could be deployed for use at landfills.

Surface Emission Monitoring (SEM) that is currently required by federal and state regulations varies greatly in cost depending on the size of the landfill.[54] The costs for large sites scale roughly proportionately with the site's area, and costs for small sites (smaller than 50 acres) are driven by fixed costs such as mobilization, equipment and reporting rather than the size of the site. Costs can range from several thousand dollars to more than $10,000 per event.[55]

A broad range of advanced methane monitoring technologies are available and can be utilized to detect, pinpoint, and quantify emissions. Over the past decade, rapid innovation has led to a diverse array of advanced methods: there are now at least 100 distinct methane measurement technologies that are commercially available for leak monitoring in the oil and gas industry.[56] The use of screening technologies has grown rapidly across the oil and gas sector in the last few years.[57] Widespread adoption and deployment of emerging technologies—even in the absence of

regulatory requirements—demonstrates their effectiveness and low costs, and underscores the opportunity to incorporate these methods into the reporting program and future regulations for landfills.

Methane monitoring technologies can be classified in several ways. Generally, technologies can be grouped into screening (*e.g.*, aerial) and close-range (*e.g.*, handheld IR cameras). Screening technologies are those that can quickly scan larger geographic areas. In some cases screening technologies may require follow-up with close-range methods. Most close-range methods are handheld instruments that can diagnose and pinpoint individual leaks or emission sources. Detection capabilities vary greatly and typically increase with proximity to the emission source. However, technologies that monitor from farther away, like aircraft and satellites, are usually much faster and can cover broad geographic areas at low cost.[58]

Comprehensive monitoring using both screening and close-range technologies is likely to be highly effective.[59] In this type of approach, screening technologies are used to monitor across broad geographic areas frequently to quickly detect the largest emission sources. Close-range methods are used for directed follow-up to pinpoint emission sources detected during screening and for routinely monitoring emissions that would not be detected by screening methods.

In general, detection sensitivity declines with spatial scale of measurement, meaning those farthest from the source will be less able to detect smaller emissions. However, there is typically a trade-off between sensitivity and survey speed, and the cost of deployment tends to decline as speed increases. For example, aerial surveys with high detection limits are low cost and can quickly cover broad areas but will only detect the largest emission events, missing smaller leaks.

Methane detection technologies differ not only in performance but also in the types of sources that can be identified and how these sources are characterized. For example, a recent study using aerial surveys identified far fewer—but much larger—sources than handheld surveys performed at the same time (39 vs 357 sources, respectively).[60] Many of the emissions found during the handheld survey were too small to be seen by aircraft, while many of the largest emission events occurred at a small number of locations and may have been missed during the close-range ground inspection. This indicates that full coverage of a system is most effective with multiple technologies.[61]

When considering the performance of a monitoring approach, it is important to distinguish between technologies and methods. Technologies include deployment platforms and sensor types, while methods include the work practices and follow up procedures after emissions are detected. Understanding the methods in combination with a technology is critical when evaluating performance and overall mitigation.[62]

Technologies typically consist of sensors and deployment platforms. Sensing modes include point measurement of ambient mixing ratios, path integrated laser-based measurements (active imaging), and column-integrated passive imaging. Sensors can be broadly categorized as:

- Point sensing (in plume sensing) — Point sensors range from simple solid-state metal oxide detectors to complex cavity ringdown spectrometers (CRDS) and gas chromatographs. Points sensors can be deployed on any platform that passes through methane plumes.

- Active imaging (remote sensing) — Active imaging systems generate sources of light that traverse methane plumes, reflect off a remote surface, and return to a detector. Changes in the reflected light are used to infer methane concentrations along the path. A common example is Light Detection and Ranging (LiDAR).
- Passive imaging (remote sensing) — Passive imaging systems use natural light to measure methane concentration in the atmosphere. They are used in all types of platforms, ranging from infrared (IR) cameras to satellite imagery.
- Non-methane — Many sensors infer the presence of leaks by measuring variability in pressure, temperature, vegetation growth, physical disturbance of equipment or the areas nearby, and other proxies.[63]

Deployment platforms can be broadly classified into the following categories:

- Aircraft[64] — Passenger aircraft, both planes and helicopters, can be equipped with various sensor technologies and used at different elevations and frequencies. These factors, along with the methodologies used, affect survey speed and detection capabilities. Some aerial technologies or methods may use remote sensing and fly higher and faster to achieve broad coverage more rapidly. Other aerial technologies and methodologies may call for lower and slower flights or use a technology with a higher sensitivity that detects more emission events but achieves less coverage in the same time period. Aircraft detection limits range from a few kilograms of methane per hour to tens of kilograms per hour. This technology is readily available and has undergone multiple, controlled release tests to verify performance metrics. Although aircraft systems are less sensitive than other systems, some aircraft are able to cover large geographic regions. This makes it possible to survey entire landscapes for large methane sources that may not otherwise be detected by targeted, site-specific inspections. The primary limiting factors for aerial methods are weather (high winds, precipitation, cloud cover), variable reflectivity from uneven snow cover, and flight permits.
- Unmanned Aerial Vehicles (UAVs)[65] — Also called drones, these can reach dangerous or hard-to-reach places and can fly very close to the source of plumes. They can be equipped with IR cameras and other relatively small, lightweight sensor devices and, like aircraft, can operate in three-dimensional space. Like manned aircraft, UAVs are not restricted to roads and can complement close-range methods by reaching dangerous or inaccessible places. Some UAV systems use point measurement technologies that directly measure methane concentrations. These point measurement UAVs are often more sensitive than aircraft techniques because of their ability to fly closer to the methane source. The primary limitations for this technology are weather, the distance from the operator, and the relatively short flight times of a few hours (at most). UAVs can typically detect and pinpoint smaller emission sources. This technology is readily available and has undergone multiple controlled release tests to verify performance metrics.
- Mobile Ground Labs (MGLs)[66] — Consisting of a vehicle with a global positioning system and a methane sensor, MGLs enable an operator to generate a map of methane concentrations along the vehicle's path. Because it is limited to the path (usually a

road), this method collects data in a two-dimensional space. Typically, MGLs will also measure environmental conditions, especially wind speed, wind direction, temperature, and humidity. MGLs can take an active or passive approach to surveying. The active approach entails MGLs driving a predetermined route along the infrastructure to be monitored, while the passive approach entails mounting sensing equipment on vehicles performing unrelated tasks, like delivery trucks.[67]

- Continuous Monitoring[68] — These systems are unique in that they are stationary. Fixed sensors are installed at a facility—typically in high-risk areas—to provide continuous, real-time readings of methane concentration and will trigger an alarm if concentrations exceed certain limits. Fixed and continuous monitoring technologies can be divided into active and passive categories. Active continuous monitors regularly scan an entire site or use a laser detector to monitor a large area of the site for emissions. Tower-based systems provide even greater coverage and can scan broadly from a single location. Passive continuous monitors use point sensors to monitor a single location at the site. For passive sensors to detect a leak, the emission plume must be carried via the wind to the location of the sensor; therefore, these kinds of sensors must be deployed in larger numbers.
- Satellites[69] — Satellites equipped to measure atmospheric methane concentrations can be combined with other data sources to identify large sources of emissions.[70] Many methane-sensing satellites are in orbit today, and still more are in development; these systems are diverse in form and function. Some global scanning satellites image most of the Earth's land surface in a matter of days with wide-ranging spatial resolution and detection limits (1,000-10,000 kg/hr)—this makes them better suited to detect only very large emissions plumes. Other satellites can be tasked to point at priority targets, offering improved sensitivity (100-1,000 kg/hr) and granular enough spatial resolution to detect and pinpoint large sources. Near-future satellite observing systems could offer improved sensitivity and frequent, global observations at facility scale, affording greater coverage and precision in locating emission sources. [71,72]

Over the past decade, there has been considerable innovation in advanced methane detection strategies. Significant advancements have occurred in technologies and deployment platforms, but also in the most effective methodologies and work practices. This innovation has largely occurred in the oil and gas production sector, but the knowledge and experimentation can be used to inform approaches to landfill methane monitoring as well.

Currently, most monitoring regulations for landfills require the use of Surface Emission Monitoring (SEM) on a quarterly basis.[73] SEM is a technique that involves using a portable methane meter near the landfill's surface to measure concentrations while traversing the site. Quarterly SEM is a requirement under EPA's New Source Performance Standards (NSPS) for landfills generating greater than 34 megagrams per year of non-methane organic compound (NMOC) emissions.[74] EPA requires monitoring using a serpentine pathway with 30-meter intervals. California has quarterly SEM requirements for landfills, which require more extensive monitoring and a lower methane concentration limit. California also requires much tighter spacing of 7.6 meters (25 feet).

Methane can be emitted by a landfill both from the landfill surface and from the gas collection and control system (GCS) components. Methane leaks from oil and gas facilities tend to be localized hot spots, such as components and equipment. Leaks from the landfill GCS are comparable and therefore advanced monitoring approaches used for oil and gas may transfer well to this source. Methane is also emitted on an ongoing basis from the landfill surface area. Some emissions are released through the landfill cover, and emissions vary with cover material and stage. Methane can also escape through surface cracks or fissures, as well as edges, steeper slopes, and areas of less compacted trash.[75] Given the pervasiveness of these emissions, they would not necessarily contrast with the surrounding methane concentration to the same degree as would a leak from oil and gas equipment, although emissions from a crack or fissure may be larger relative to background, and so may be easier to detect. Therefore to detect and monitor these ongoing landfill surface emissions, approaches transferred from oil and gas may require modification.

The technology and techniques used in the oil and gas industry can be readily adapted in many instances for landfill gas capture systems, but layered approaches using these technologies in conjunction with SEM may be more effective to look for surface emissions. Handheld IR cameras could be used by landfill personnel to look for methane emissions from the GCS. Drone-mounted IR cameras have the potential to monitor areas where personnel are not available or that cannot be safely accessed.[76] Aerial techniques, including flyovers, are already being deployed and can capture point source emissions from landfills (and in some cases, diffuse area source emissions, depending on their detection sensitivity and flight patterns).[77]

Advanced methane monitoring technologies can be highly effective at locating hotspots and super-emitters at landfills—particularly aerial technologies such as flyovers, satellites, and drones.[78] This is important not only for mitigation efforts but for improving the accuracy of emission estimates. The existing requirements for emissions estimation under Subpart HH assume that GCS systems are operating normally and the estimation methodologies do not account for emissions due to operational anomalies. Specifically they fail to capture large quantities of emissions that may leak from the GCS system, degraded surface areas of the landfills, or other sources. These leaks could be short term events, such as a blockage in a gas well that is detected and cleared, or longer term, such as emissions from surface cracks in areas with infrequent inspections. As a result, the existing estimation methodologies inherently tend to undercount emissions, as indicated by the substantially higher emissions levels measured in overflights. While we have suggested some improvements to the estimation methodologies, these suggested modifications alone are unlikely sufficient to fully capture the effect of these anomalous events (and EPA may or may not adopt our recommendations in full). Monitoring with advanced technologies can help to correct these systemic inaccuracies in the reported emissions data. These technologies are able to catch large emission events that are not accounted for in the existing reporting requirements and can be easily missed by ground-based monitoring methods. Emissions observed using advanced methods can and should be used to supplement and improve the accuracy of estimates derived and reported under the existing framework. To effectuate this, we urge EPA to require quarterly monitoring with advanced aerial technologies at a subset of the largest landfills, as defined by EPA, and reporting of all detected emissions.

EPA's authority under section 114 of the Clean Air Act is broad. The section clearly authorizes EPA to require anyone who "operates any emission source" to "install, use, and maintain such monitoring equipment," "sample such emissions," and "provide such other information as the

Administrator may reasonably require."[79] Imposing a monitoring requirement undersection 114 that is necessary to obtain accurate emissions data not otherwise currently available is reasonable. And, the relatively low cost of aerial monitoring—which is typically done by contractors—further underscores the reasonableness of such a requirement. Data gathered through quarterly aerial monitoring at large landfills would be valuable for informing future landfill regulations, including monitoring requirements, and would also serve as a model for future revisions to the reporting program that rely on measurement data.[80] It should also help EPA understand how much existing regulations are driving down emissions and how operators are complying with those regulations.[81]

We urge EPA to require quarterly monitoring and emissions reporting at certain large landfills using aerial or drone-based methods with technologies that are capable of quantifying a total emission flux from the site. Emissions detected during surveys should be quantified using the best available engineering estimates and operational data, or otherwise quantified using a default duration, such as since the last monitoring survey occurred. Operators that conduct follow-up investigations and determine the root cause of the large emission event should be required to report that information, including whether and how it supports quantification using a shorter duration than the default. Those that do not, or who cannot determine a root cause, should be required to quantify emissions using the default duration set by EPA.

Paralleling a similar proposal for Subpart W, emissions detected through quarterly aerial monitoring should be reported as a separate category of "large release events" in Subpart HH. However, instead of defining a large release event by the quantity of methane released, here we urge EPA to define this category for landfills as any emissions detected and quantified during aerial monitoring. Aerial technologies, depending on their sensitivity and coverage, often only capture and quantify point source emissions (*e.g.*, concentrated methane emissions from a condensed surface feature or infrastructure component) rather than area sources (*e.g.*, the release of methane in a more diffuse fashion across a wider surface area, as estimated by the existing or proposed reporting requirements for landfills.)[82] In these cases, there is little risk of double counting emissions and a much greater risk that omitting the emissions detected by aerial technologies would make estimates less accurate overall. Nevertheless, if EPA were to conclude that a substantial proportion of the emissions detected by aerial technologies would have already been represented in the estimated emissions, EPA could maintain the aerial emissions data in a separate category that would not count toward a landfill's emission total. This would eliminate any risk of double counting but still allow EPA to gather advanced monitoring data that it could use to inform regulatory approaches and revisions to emission estimating methods. To ensure that operators do not intentionally or otherwise conduct advanced monitoring in ways that are less likely to uncover large emissions events, we recommend that EPA set forth monitoring requirements, including detection capabilities, operating parameters, and acceptable technologies.[83]

Footnotes

[52] See, *e.g.*, Waste Management, Sustainable Technology Factsheet, https://www.wm.com/content/dam/wm/assets/inside-wm/sustainable-technology/wm-emissions-fact-sheet.pdf; see also Datu Research, Find, Measure, Fix: Jobs in the U.S. Methane Emissions Mitigation Industry (2021); EPA, Methane Detection Technology Workshops,

https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry/epa-methane-detection-technology-workshop.

[53] Marcy Lowe, Advanced Methane Monitoring: Gauging the Ability of U.S. Service Firms to Scale Up, Datu Research (July 22, 2021), https://blogs.edf.org/energyexchange/files/2021/08/Advanced-Methane-Monitoring-Survey_Datu-Research_8-10-2021.pdf

[54] Pat Sullivan and John Henkelman, Understanding landfill gas monitoring techniques, Waste Today (March 2019), https://www.wastetodaymagazine.com/article/landfill-gas-monitoring-techniques/.

[55] Id.

[56] Highwood Emission Management, Technical Report: Leak detection methods for natural gas gathering, transmission, and distribution pipelines (2022) https://highwoodemissions.com/reports/leak-detection-methods-for-natural-gas-gathering/ [hereinafter "Highwood 2022"].

[57] See Highwood 2022; Datu 2021; see also Scientific Aviation, Major Energy Companies Join Forces to Battle Methane Emissions (March 2021), http://www.scientificaviation.com/major-energy-companies-join-forces-to-battle-methane-emissions/.

[58] Id.

[59] Fox et al., A review of close-range and screening technologies for mitigating fugitive methane emissions in upstream oil and gas, 14 Env. Res. Letters 53002 (2019), https://iopscience.iop.org/article/10.1088/1748-9326/ab0cc3.

[60] Tyner & Johnson, Where the Methane Is—Insights from Novel Airborne LiDAR Measurements Combined with Ground Survey Data, 55 Env. Sci. Tech. 9773 (2021), https://pubs.acs.org/doi/10.1021/acs.est.1c01572.

[61] Fox et al., A review of close-range and screening technologies for mitigating fugitive methane emissions in upstream oil and gas, 14 Env. Res. Lett. 053002 (2019), https://iopscience.iop.org/article/10.1088/1748-9326/ab0cc3.

[62] See id.

[63] Highwood 2022.

[64-69] Id.

[70] Datu Research, Find, Measure, Fix (2021); Highwood Emission Management, Technical Report: Leak detection methods for natural gas gathering, transmission, and distribution pipelines (2022), https://highwoodemissions.com/pipeline-report/.

[71] Id.

[72] Daniel J. Jacob et al. (2022). Quantifying methane emissions from the global scale down to point sources using satellite observations of atmospheric methane. Atmospheric Chemistry and Physics, 22(14). https://acp.copernicus.org/articles/22/9617/2022/acp-22-9617-2022-assets.html

[73] Pat Sullivan and John Henkelman, Understanding landfill gas monitoring techniques, Waste Today (March 2019), https://www.wastetodaymagazine.com/article/landfill-gas-monitoring-techniques/.

[74] 40 CFR 60.764(a)(6); 40 CFR 60.35f(a)(6).

[75] Sonderfeld et al. (2017). CH_4 emission estimates from an active landfill site inferred from a combined approach of CFD modelling and in situ FTIR measurements. Atmospheric Measurement Techniques, 10(10). https://amt.copernicus.org/articles/10/3931/2017/

[76] See, *e.g.*, Arlene Karidis, Will Evolving Drones Shape Future Landfill Operations'. Waste 360 (Sept. 28, 2022), https://www.waste360.com/landfill-operations/will-evolving-drones-shape-future-landfill-operations.

[77] See, *e.g.*, Nichola Groom, Methane menace: Aerial survey spots 'super-emitter' landfills, Reuters (June 18, 2021), https://www.reuters.com/business/sustainable-business/methane-menace-aerial-

survey-spots-super-emitter-landfills-2021-06-18/ (Scientific Aviation has been conducting aerial flyovers since 2016); see also Cusworth et al., Strong methane point sources contribute a disproportionate fraction of total emissions across multiple basins in the United States, 119 PNAS 38 (2022), https://www.pnas.org/doi/full/10.1073/pnas.2202338119 (landfill emission data gathered by GAO aircraft).

[78] See, *e.g.*, Katherine Bourzac, Methane-monitoring satellites spot landfill superemitters, Chemical Engineering News (August 17, 2022), https://cen.acs.org/environment/greenhouse-gases/Methane-monitoring-satellites-spot-landfill/100/i29

[79] 42 U.S.C. § 7414(a)(1)

[80] See id. § 7414(a) (setting forth the purposes for which EPA can require monitoring, which include "developing or assisting in the development of any implementation plan under section 7410 or section 7411(d) of this title, any standard of performance under section 7411 of this title, any emission standard under section 7412 of this title...").

[81] See id.

[82] The California Methane Survey (2020), https://www.energy.ca.gov/sites/default/files/2021-05/CEC-500-2020-047.pdf

[83] Many of these requirements could be aligned with, or even cross-reference, monitoring requirements for alternative leak detection and repair standards that are currently under development for EPA's oil and gas section 111 standards, OOOOb/c.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 81

Comment Excerpt: Advanced methane monitoring technologies are already widely available and in use across the oil and gas sector, as well as by some leading landfill operators.[194] Many of these technologies are highly effective and inexpensive. And many companies providing advanced methane mitigation services are domestic and provide well-paying jobs in geographies across the country. These technologies are particularly capable and efficient at screening broad geographic areas for emissions to detect large, potentially intermittent emission sources. Layered approaches utilizing multiple techniques may be required in some cases to pinpoint sources of smaller leaks. A recent comprehensive survey from Datu Research shows that advanced leak detection services are widely-available for the oil and gas sector. Many of these same companies and technologies can be deployed for landfills, and firms offering advanced methane monitoring are poised to scale up in coming years under the upcoming oil and gas regulations.[195] Firms offering advanced monitoring services have nearly doubled in the past four years alone and operate in regions across the country. Nearly half of firms surveyed (47%) said they could scale up significantly in the coming years; these respondents comprised those using fixed sensors,

airplanes, satellites, or a combination of these technologies. Eighty-nine percent of the firms surveyed can detect emissions at the site level, while 53% can pinpoint smaller leak sources. Datu's findings underscore that advanced methane detection technologies are already widely available and could be deployed for use at landfills. The Surface Emission Monitoring (SEM) that is currently required by federal and state regulations varies greatly in cost depending on the size of the landfill.[196] The costs for large sites scale roughly proportionately with the site's area, and costs for small sites (smaller than 50 acres) are driven by fixed costs such as mobilization, equipment and reporting rather than the size of the site. Costs can range from several thousand dollars to more than $10,000 per event.[197] The aerial monitoring techniques described below are comparable in costs, and in many cases are less expensive.

A broad range of advanced methane monitoring technologies are available and can be utilized to detect, pinpoint, and quantify emissions. Over the past decade, rapid innovation has led to a diverse array of advanced methods: there are now at least 100 distinct methane measurement technologies that are commercially available for leak monitoring in the oil and gas industry.[198] The use of screening technologies has grown rapidly across the oil and gas sector in the last few years.[199] Widespread adoption and deployment of emerging technologies — even in the absence of regulatory requirements — demonstrates their effectiveness and low cost and underscores the opportunity to incorporate these methods into the reporting program and future regulations for landfills. Methane monitoring technologies can be classified in several ways. Generally, technologies can be grouped into screening (*e.g.*, aerial) and close-range (*e.g.*, handheld IR cameras). Most close-range methods are handheld instruments that can diagnose and pinpoint individual leaks or emission sources. Screening technologies are those that can quickly scan larger geographic areas. In some cases screening technologies may require follow-up with close-range methods. Detection capabilities vary greatly and typically increase with proximity to the emission source. However, technologies that monitor from farther away, like aircraft and satellites, are usually much faster and can cover broad geographic areas at lower cost.[200] Comprehensive monitoring using both screening and close-range technologies is likely to be highly effective.[201] In this type of approach, screening technologies are used to monitor across broad geographic areas frequently to quickly detect the largest emission sources. Close-range methods are used for directed follow-up to pinpoint emission sources detected during screening and for routinely monitoring for emissions that would not be detected by screening methods. This type of approach may be required for adequate mitigation but not necessarily for quantifying and estimating total emissions. In general, detection sensitivity declines with spatial scale of measurement, meaning those farthest from the source will be less able to detect smaller emissions. However, there is typically a trade-off between sensitivity and survey speed, and the cost of deployment tends to decline as speed increases. For example, aerial surveys with high detection limits are low cost and can quickly cover broad areas but will only detect the largest emission events, missing smaller leaks. Methane detection technologies differ not only in performance but also in the types of sources that can be identified and how these sources are characterized. For example, a recent study using aerial surveys identified far fewer — but much larger — sources than handheld surveys performed at the same time (39 vs 357 sources, respectively).[202] Many of the emissions found during the handheld survey were too small to be seen by aircraft, while many of the largest emission events occurred at a small number of locations and may have been missed during the ground inspection. This indicates that full coverage of a system is most effective with multiple technologies.[203] When considering the performance of a monitoring approach, it is important to distinguish between technologies and

methods. Technologies include deployment platforms and sensor types, while methods include the work practices and follow-up procedures after emissions are detected. Understanding the methods in combination with a technology is critical when evaluating performance and overall mitigation.[204] Technologies typically consist of sensors and deployment platforms. Sensing modes include point measurement of ambient mixing ratios, path integrated laser-based measurements (active imaging), and column-integrated passive imaging. Sensors can be broadly categorized as:

- Point sensing (in plume sensing) — Point sensors range from simple solid-state metal oxide detectors to complex cavity ringdown spectrometers (CRDS) and gas chromatographs. Point sensors can be deployed on any platform that passes through methane plumes.
- Active imaging (remote sensing) — Active imaging systems generate sources of light that traverse methane plumes, reflect off a remote surface, and return to a detector. Changes in the reflected light are used to infer methane concentrations along the path. A common example is Light Detection and Ranging (LIDAR).
- Passive imaging (remote sensing) — Passive imaging systems use natural light to measure methane concentration in the atmosphere. They are used in all types of platforms, ranging from infrared (IR) cameras to satellite imagery.
- Non-methane — Many sensors infer the presence of leaks by measuring variability in pressure, temperature, vegetation growth, physical disturbance of equipment or the areas nearby, and other proxies.[205]

Deployment platforms can be broadly classified into the following categories:

- Aircraft[206]— Passenger aircraft, both planes and helicopters, can be equipped with various sensor technologies and used at different elevations and frequencies. These factors, along with the methodologies used, affect survey speed and detection capabilities. Some aerial technologies or methods may use remote sensing and fly higher and faster to achieve broad coverage more rapidly. Other aerial technologies and methodologies may call for lower and slower flights or use a technology with a higher sensitivity that detects more emission events but achieves less coverage in the same time period. Aircraft detection limits range from a few kilograms of methane per hour to tens of kilograms per hour. This technology is readily available and has undergone multiple, controlled release tests to verify performance metrics. Although aircraft systems are less sensitive than other systems, some aircraft are able to cover large geographic regions. This makes it possible to survey entire landscapes for large methane sources that may not otherwise be detected by targeted, site specific inspections. The primary limiting factors for aerial methods are weather (high winds, precipitation, cloud cover), variable reflectivity from uneven snow cover, and flight permits.
- Unmanned Aerial Vehicles (UAVs)[207]— Also called drones, these can reach dangerous or hard-to-reach places and can fly very close to the source of plumes. They can be equipped with IR cameras and other relatively small, lightweight sensor devices and, like aircraft, can operate in three-dimensional space. Like manned

aircraft, UAVs are not restricted to roads and can complement close-range methods by reaching dangerous or inaccessible places. Some UAV systems use point measurement technologies that directly measure methane concentrations. These point measurement UAVs are often more sensitive than aircraft techniques because of their ability to fly closer to the methane source. The primary limitations for this technology are weather, the distance from the operator, and the relatively short flight times of a few hours (at most). UAVs can typically detect and pinpoint smaller emission sources. This technology is readily available and has undergone multiple controlled release tests to verify performance metrics.

- Mobile Ground Labs (MGLs)[208] — Consisting of a vehicle with a global positioning system and a methane sensor, MGLs enable an operator to generate a map of methane concentrations along the vehicle's path. Because it is limited to the path (usually a road), this method collects data in a two-dimensional space. Typically, MGLs will also measure environmental conditions, especially wind speed, wind direction, temperature, and humidity. MGLs can take an active or passive approach to surveying. The active approach entails MGLs driving a predetermined route along the infrastructure to be monitored, while the passive approach entails mounting sensing equipment on vehicles performing unrelated tasks, like delivery trucks.[209]
- Continuous Monitoring[210] — These systems are unique in that they are stationary. Fixed sensors are installed at a facility—typically in high-risk areas—to provide continuous, real-time readings of methane concentration and will trigger an alarm if concentrations exceed certain limits. Fixed and continuous monitoring technologies can be divided into active and passive categories. Active continuous monitors regularly scan an entire site or use a laser detector to monitor a large area of the site for emissions. Tower-based systems provide even greater coverage and can scan broadly from a single location. Passive continuous monitors use point sensors to monitor a single location at the site. For passive sensors to detect a leak, the emission plume must be carried via the wind to the location of the sensor; therefore, these kinds of sensors must be deployed in larger numbers.
- Satellites[211] — Satellites equipped to measure methane concentrations can be combined with other data to identify large sources of emissions.[212] Many methane-sensing satellites currently exist, and still more are in development. These systems are diverse in form and function; some have very high minimum detection limits and therefore are better suited to detect large plumes, while others with improved sensitivity are capable of detecting smaller sources.[213] Minimum detection limits of satellites have been estimated to be between 1,000 and 7,100 kg CH_4/hr.[214] More recently, GHGSat has claimed facility-scale detection limits as low as 100 kg/h, but these have not yet been independently verified, and other point source imagers, such as PRISMA and EnMAP, report sensitivity in the 100-1,000 kg/h range.[215]

Currently, most monitoring regulations for landfills require the use of Surface Emission Monitoring (SEM) on a quarterly basis.[216] SEM is a technique that involves using a portable methane meter near the landfill's surface to measure concentrations while traversing the site. Quarterly SEM is a requirement under EPA's New Source Performance Standards (NSPS) for landfills generating greater than 34 megagrams per year of non-methane organic compound

(NMOC) emissions.[217] EPA requires monitoring using a serpentine pathway with 30-meter intervals. California also has quarterly SEM requirements for landfills, which require more extensive monitoring and a lower methane concentration limit. California also requires much tighter spacing of 7.6 meters (25 feet). Methane can be emitted by a landfill both from the landfill surface and from the GCS components. Methane leaks from oil and gas facilities tend to be localized hot spots, such as components and equipment. Leaks from the landfill GCS are comparable and therefore advanced monitoring approaches used for oil and gas may transfer well to this source. Methane from the landfill surface is usually emitted in smaller quantities on an ongoing basis from a large area. While some of these emissions filter up through the cover material across the landfill, there is also a strong likelihood that much of the methane escapes through surface cracks or fissures, as well as edges, steeper slopes and areas of less compacted trash. Given the pervasiveness of these emissions, they would not necessarily contrast with the surrounding methane concentration to the same degree as would a leak from oil and gas equipment, although emissions from a crack or fissure may be larger relative to background, and so may be easier to detect. Therefore to detect and monitor these ongoing landfill surface emissions, approaches transferred from oil and gas may require modification. The technology and techniques used in the oil and gas industry can be readily adapted in many instances for landfill GCS, but layered approaches using these technologies in conjunction with SEM may be more effective to look for and mitigate surface emissions. Handheld IR cameras could be used by landfill personnel to look for methane emissions from the GCS. However, there are some questions as to their efficacy, and aerial techniques are more commonly used. Drone-mounted IR cameras have the potential to monitor areas where personnel are not available or that cannot be safely accessed.[218] Aerial techniques, including flyovers, are already being deployed in some instances and can capture large emissions events from landfills.[219] Aerial techniques used for monitoring and quantification may not require pinpoint follow up, although that may be necessary to locate the underlying source for mitigation.

Advanced methane monitoring technologies can be highly effective at locating hotspots and super-emitters at landfills—particularly aerial technologies such as flyovers, satellites, and drones.[220] This is important for improving the accuracy of emission estimates. The existing requirements for emissions estimation under subpart HH assume that GCS systems are operating normally, and the estimation methodologies do not account for emissions due to operational anomalies. Specifically, they fail to capture large quantities of emissions that may leak from the GCS system, degraded surface areas of the landfills or other sources. These leaks could be short term events, such as a blockage in a gas well that is detected and cleared, or longer term, such as emissions from surface cracks in areas with infrequent inspections. As a result, the existing estimation methodologies inherently tend to undercount emissions, as indicated by the substantially higher emissions levels measured in overflights. While we have suggested some improvements to the estimation methodologies, these suggested modifications alone are unlikely sufficient to fully capture the effect of these anomalous events (and EPA may or may not adopt our recommendations in full). Monitoring with advanced technologies can help to correct these systemic inaccuracies in the reported emissions data. These technologies are able to catch large emission events that are not accounted for in the existing reporting requirements and can be easily missed by ground-based monitoring methods. Emissions observed using advanced methods can and should be used to supplement and improve the accuracy of estimates derived and reported under the existing framework. To effectuate this, we urge EPA to require quarterly monitoring with advanced aerial technologies at a subset of the largest landfills, as defined by

EPA (*e.g.*, based on waste acceptance rates)[221] and reporting of all detected emissions. EPA's authority under section 114 of the Clean Air Act is broad. The section clearly authorizes EPA to require anyone who "operates any emission source" to "install, use, and maintain such monitoring equipment," "sample such emissions," and "provide such other information as the Administrator may reasonably require.[222] A monitoring requirement imposed under section 114 that is necessary to obtain accurate emissions data not otherwise currently available is reasonable. And the relatively low cost of aerial monitoring—which is typically done by contractors—further underscores the reasonableness of such a requirement. Data gathered through quarterly aerial monitoring at large landfills would be valuable for informing future landfill regulations, including monitoring requirements, and would also serve as a model for future revisions to the reporting program that rely on measurement data.[223] It should also help EPA understand how much existing regulations are driving down emissions and how operators are complying with those regulations.[224] We urge EPA to require quarterly monitoring and emissions reporting at certain large landfills using aerial or drone-based methods with technologies that are capable of quantifying a total emission flux from the site. Emissions detected during surveys should be quantified using the best available engineering estimates and operational data, or otherwise quantified using a default duration, such as since the last monitoring survey occurred. Operators who conduct follow-up investigations and determine the root cause of the large emission event should be required to report that information, including whether and how it supports quantification using a shorter duration than the default. Those that do not, or who cannot determine a root cause, should be required to quantify emissions using the default duration set by EPA. Paralleling a similar proposal for subpart W, emissions detected through quarterly aerial monitoring could be reported as a separate category of "large release events" in subpart HH. However, instead of defining a large release event by the quantity of methane released, here we urge EPA to define this category for landfills as any emissions detected and quantified during aerial monitoring. Most emissions detected by aerial technologies will be quite large, as the sensitivities of aerial technologies are generally not low enough to capture and quantify the dispersed surface emissions that are estimated through the existing or proposed reporting requirements for landfills. Thus, there is little risk of double counting emissions and a much greater risk that omitting the emissions detected by aerial technologies would make estimates less accurate overall. Nevertheless, if EPA were to conclude that a substantial proportion of the emissions detected by aerial technologies would have already been represented in the estimated emissions, EPA could maintain the aerial emissions data in a separate category that would not count toward a landfill's emission total. This would eliminate any risk of double counting but still allow EPA to gather advanced monitoring data that it could use to inform regulatory approaches and revisions to emission estimating methods. To ensure that operators do not intentionally or otherwise conduct advanced monitoring in ways that are less likely to uncover large emissions events, we recommend that EPA set forth monitoring requirements, including detection capabilities, operating parameters, and acceptable technologies.[225]

Footnotes

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https://www.edf.org/sites/default/files/content/FindMeasureFixReport202 1.pdf [hereinafter "Datu 2021"]; EPA, Methane Detection Technology Workshops, https://www.epa.gov/controlling-air-pollution-oil-and-natural-gasindustry/epa-methane-detection-technology-workshop.

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[196] Pat Sullivan & John Henkelman, Understanding Landfill Gas Monitoring Techniques, Waste Today (Mar. 2019),

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[197] Id.

[198] Highwood Emission Management, Technical Report: Leak Detection Methods for Natural Gas Gathering, Transmission, and Distribution Pipelines (2022), https://highwoodemissions.com/pipeline-report/ [hereinafter "Highwood 2022").

[199] See Highwood 2022; Datu 2021; see also Scientific Aviation, Major Energy Companies Join Forces to Battle Methane Emissions (Mar. 2021), http://www.scientificaviation.com/major-energy-companies-join-forces-to-battlemethane- emissions/.

[200] Id.

[201] Fox et al., A Review of Close-range and Screening Technologies for Mitigating Fugitive Methane Emissions in Upstream Oil and Gas, 14 Env. Res. Letters 53002 (2019), https://opscience.iop.org/article/10.1088/1748- 9326/ab0cc3.

[202] Tyner & Johnson, Where the Methane Is—Insights from Novel Airborne LiDAR Measurements Combined with Ground Survey Data, 55 Env. Sci. Tech. 9773 (2021), https://pubs.acs.org/doi/10.1021/acs.est. lcO1572

[203] Fox et al., supra note 201.

[204] See id.

[205] Highwood 2022.

[206-211] Id.

[212] Datu 2021; Highwood 2022.

[213] See, *e.g.*, EDF, MethaneSAT, https://www.methanesat.org/; Daniel J. Jacob et al., Quantifying Methane Emissions from the Global Scale Down to Point Sources Using Satellite Observations of Atmospheric Methane, 22 Atmospheric Chemistry and Phys. 14 (2022), https://acp.copernicus.org/articles/22/96 17/2022/acp-22-9617-2022-assets html.

[214] Highwood 2022.

[215] Id

[216] Pat Sullivan & John Henkelman, supra note 196.

[217] 40 C.LE.R. § 60.764(a)(6); 40 C.F.R. § 60.35f(a)(6).

[218] See, *e.g.*, Arlene Karidis, Will Evolving Drones Shape Future Landfill Operations?, Waste 360 (Sept. 28, 2022), https://www.waste360.com/landfill-operations/will-evolving-drones-shape-future-landfill-operations.

[219] See, *e.g.*, Nichola Groom, Methane Menace: Aerial Survey Spots 'Super-emitter' Landfills, Reuters (June 18, 2021), https://Awww.reuters.com/business/sustainable-business/methane-menace-aerial-survey-spots-super-emitterlandfills-2021-06-18/ (Scientific Aviation has been conducting aerial flyovers since 2016); see also Cusworth et al., Strong Methane Point Sources, supra note 143 (landfill emission data gathered by GAO aircraft).

[220] See, *e.g.*, Katherine Bourzac, Methane-monitoring Satellites Spot Landfill Superemitters, Chemical Engineering News (Aug. 17, 2022), https://cen.acs.org/environment/greenhouse-gases/Methane-monitoring-satellites-spotlandfill/100/129.

[221] A reasonable threshold for the subset of large landfills could be landfills accepting 1 million tons or more of waste per year. Of the 906 open landfills that reported waste acceptance rates to LMOP in 2020, 76 (~8% of the total) reported annual waste acceptance over | million tons, and this group accounts for about 28% of LFG generation as reported under LMOP.

[222] A U.S.C. § 7414(a)(1).

[223] See id. at § 7414(a) (setting forth the purposes for which EPA can require monitoring, which include "developing or assisting in the development of any implementation plan under section 7410 or section 7411(d) of this title, any standard of performance under section 7411 of this title, any emission standard under section 7412 of this title."

[224] See id.

[225] Many of these requirements could be aligned with, or even cross-reference, monitoring requirements for alternative leak detection and repair standards that are currently under development for EPA's oil and gas section 111 standards, OOOOb/c.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 25

Comment Excerpt: While we support EPA's efforts to improve emissions reporting requirements for municipal solid waste landfills, we would urge EPA to give consideration to research suggesting these bottom-up emission estimation methodologies are inherently flawed.[87]

First order-decay (FOD) methane emissions models, like those utilized in Subpart HH and the U.S. Greenhouse Gas Inventory, were developed early in the lifetime of waste sector emissions quantification studies – around the same time as the first field studies on methane emissions from landfills in the 1980s and 1990s. [88] Since that time, these FOD models have been neither significantly updated nor adjusted. Unfortunately, these models and the assumptions used in them contain serious shortcomings that inhibit fully accurate understanding of landfill emissions.[89] Recent studies have utilized remote sensing technology to measure landfill emissions and have found that there are significant discrepancies between the emissions estimated per FOD models and measurements via remote sensing.[90]

We acknowledge that the updates to the FOD methodology presented in the proposed revisions to the GHGRP are intended to add flexibility while improving accuracy for landfill operators with varying levels of data availability. However, considering the discrepancies that are evident with FOD models, it is likely that these changes will not actually contribute to increased accuracy. According to the National Academy of Sciences ("NAS"), recent changes to the

GHGRP methodology have yet to be field validated for use at specific sites, and may in fact "magnify[ies], rather than reduce[s] the shortcomings of the FOD method." [91] Increased complexity from the proposed changes will likely further magnify these shortcomings.

While remote sensing technology presents exciting opportunities to gather empirical data on landfill emissions, we acknowledge that these methods are not currently practiced at scale by landfill operators to regularly collect data. Luckily, there are options available to produce more accurately modeled emissions estimates. For modeled (rather than empirical) methodologies to yield more accurate results, however, more site-specific data collection is required. At this point in time, many landfill operators are not collecting or reporting the data points necessary to satisfy an improved modeling framework. These data points can include site specific characterization of the waste stream, information on the type, thickness, and coverage of cover soils, and types of improved landfill gas management practices implemented at the site. This information could then be used to improve the degradable organic carbon and k values, methane oxidation, and collection efficiency variables, respectively, used in the modeling approaches.

In order to improve the accuracy of reporting, as well as the overall efficacy of the GHGRP, EPA ought to implement the following tactics: (1) acknowledge the uncertainties linked to FOD models regarding methane emission estimates from landfills; (2) phase in additional required data points for reporting by landfill operators to improve site specific GHGRP methane emission estimates and improve estimation of default values; and (3) begin to incorporate top-down measurements into reporting to validate or support bottom-up modeling estimates. CATF consulted RMI, the Environmental Defense Fund, and Carbon Mapper during the creation of their comments. We support RMI's detailed recommendations to integrate additional site-level data and advanced monitoring technologies into the GHG reporting requirements.[92]

Footnotes

[87] Cusworth et al., Using remote sensing to detect, validate, and quantify methane emissions from California solid waste operations, 15 Env't Rsch. Letters 054012 (2020), https://iopscience.iop.org/article/10.1088/1748- 9326/ab7b99.

[88] Kurt Spokas et al., From California Dreaming to California Data: Challenging Historic Models for Landfill CH_4 Emissions, 3 Elementa 51 (2015), https://online.ucpress.edu/elementa/article/doi/10.12952/journal.elementa.000051/112713/From-Californiadreaming-to-California-data.

[89] Lavoie et al., Aircraft-Based Measurements of Point Source Methane Emissions in the Barnett Shale Basin, 49 Env't Sci. & Tech. 7904 (2015), https://doi.org/10.1021/acs.est.5b00410.

[90] See Xinrong Ren et al., Methane Emissions from the Baltimore-Washington Area Based on Airborne Observations: Comparison to Emissions Inventories, 123 J. Geophysical Rsch.: Atmospheres, 8869 (2018), https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2018JD028851; Joannes D. Maasakkers et al., Using Satellites to Uncover Large Methane Emissions from Land-fills, 8 Sci. Advances (2022), https://www.science.org/doi/10.1126/sciadv.abn9683; see also Hamid R. Amini HR et al., Comparison of first order-decay modeled and actual field measured municipal solid waste landfill methane data, 33 Waste Mgmt. 2720 (2013), https://pubmed.ncbi.nlm.nih.gov/23988298/; Riley M. Duren et al., California's methane super-emitters 575 Nature 180 (2019), https://doi.org/10.1038/s41586-019-1720-3.

[91] Nat'l Acad. of Sciences, Engineering, and Medicine, Improving Characterization of Anthropogenic Methane Emissions in the United States (2018),

https://nap.nationalacademies.org/catalog/24987/improving-characterizationof-anthropogenic-methane-emissions-in-the-united-states.

[92] RMI, Comments for the Environmental Protection Agency's Proposed Rule Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule on Subpart HH - Municipal Solid Waste Landfills (2022).

Response: EPA agrees with the commenter that additional site-level data and advanced monitoring technologies might enhance GHG reporting under subpart HH. In the 2023 Supplemental Proposal, we proposed modifying equations HH–6, HH–7, and HH–8 to incorporate direct-measurement data collected from methane surface emissions monitoring. While we are not finalizing the proposed reporting requirements to incorporate direct-measurement data collected from surface emissions monitoring at this time, we are reviewing comments on these modifications along with comments received on other methane monitoring technologies and how such data may be incorporated into future subpart HH reporting. We appreciate the recommendations offered by the commenter.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 6

Comment Excerpt: EPA should lower the reporting threshold in order to require more landfills to report to GHGRP. At present, landfills are required to report only if they emit at least 25,000 metric tons of CO_2e or more. In 2020, EIP conducted an analysis of emissions data for landfills in Maryland using 2017 data. Of the 40 gas-producing landfills in Maryland that year, only 19 reported their greenhouse gas emissions to the GHGRP because of the threshold.[34] EPA should set a lower threshold in order to obtain data from more sites. This will provide more accurate picture of the climate impact of landfills.

Footnotes

[34] EIP, Greenhouse Gases from Maryland's Landfills: Underestimated and Under Regulated, at 17 (June 9, 2021), https://environmentalintegrity.org/wp-content/uploads/2021/06/MD-Landfill-Methane-Report-6.9.2021-unembargoed_with-Attachments.pdf; see also 2017 Maryland Greenhouse Gas Inventory, available at https://mde.maryland.gov/programs/air/climatechange/pages/greenhousegasinventory.aspx.

Response: First, the EPA notes that the reporting requirement (trigger for a landfill to start reporting under subpart HH) is based on a landfill's methane generation and not its actual emissions. This requirement was included in the original rule to collect information from all landfills that had the potential to emit over 25,000 mt CO_2e. Once facilities are subject to reporting, the off-ramp provision in subpart A allows facilities to discontinue reporting based on their actual emissions. We did not propose to revise the reporting thresholds for subpart HH,

therefore, this comment is out of scope for this proposed rulemaking. However, the EPA acknowledges this comment and may consider it in a future rulemaking.

Commenter Name: Not provided
Commenter Affiliation: Institute for Energy and Resource Management (IeRM)
Commenter Type: Academia
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0189-A1
Comment Excerpt Number: 2

Comment Excerpt: Direct methane emissions are only part of the problems created by landfills. The European Union has recognized this and has adopted legislation for all members to phase out entirely the landfilling of untreated municipal solid waste. The alternative, based on the international waste management hierarchy, reduces the amount of waste generated, greatly improves recycling rates, recovers materials and energy, and leaves only a small amount of inert material to be disposed of. While the marginal costs of landfilling may be low, the practice ignores significant externalities that the government and the citizens pay for. Landfilling can and should be phased out by 2030.

Response: The EPA acknowledges the commenter's concern. However, the EPA did not propose the phaseout of landfilling for municipal solid waste. Therefore, this comment is out of scope for this proposed rulemaking.

Commenter Name: Susan Glickman
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0309
Comment Excerpt Number: 3

Comment Excerpt: Recent research points to methane and its largest sources, notably landfills, as significant drivers of human-induced climate change. The only effective way to reduce landfill methane emissions over the long-term and combat adverse climate effects is by diverting waste away from landfills and requiring landfills to monitor actual emissions using available technologies.

Response: While the EPA appreciates the comment, it is not specific to what is proposed or the type of information the EPA sought comment on for subpart HH. For example, we proposed updated emission factors for modeling methane generation from landfills, new reporting requirements for landfills, and modifications to equations HH–6, HH–7, and HH–8 to incorporate surface emissions monitoring data. We also requested information on how methane monitoring technologies such as satellite imaging, aerial measurements, vehicle-mounted mobile measurement, or continuous sensor networks, might enhance subpart HH emissions reporting, as

well as examples of methane data collected from available monitoring methodologies and how such data might be incorporated into subpart HH for estimating annual emissions.

Commenter Name: Susan Glickman
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0309
Comment Excerpt Number: 4

Comment Excerpt: Allowing landfills to report emissions into the Inventory of U.S. Greenhouse Gas Emissions and Sinks based on outdated models and estimations inaccurately informs policy decision making especially by using models that do not reflect up to date research thus significantly underreporting GHG emissions. The EPA should reevaluate the proposed revisions to the GHGRP, considering all relevant data and give actual measurements precedence over models. Accurate landfill emissions reporting is critical to informing effective climate policies and promoting the climate benefits brought by diverting waste to other more sustainable waste management solutions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0309, Excerpt 3.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 17

Comment Excerpt: In July 2007, the Solid Waste Industry for Climate Solutions ("SWICS") released its first white paper entitled *Current MSW Industry Position and State-of-the-Practice on LFG Collection Efficiency, Methane Oxidation, and Carbon Sequestration in Landfills* ("SWICS White Paper"). The White Paper was updated in 2009 (version 2.1) to incorporate additional studies and data, and again in 2012 (version 2.2) to include methane oxidation results from evaluations of cover soils at 90 landfills. As a general matter, the SWICS White Paper can be considered the most comprehensive compilations of peer-reviewed data and studies relating to a broad range of municipal solid waste landfills, for the express purpose of creating a methodology that would result in more accurate inventories of methane from landfills. Unlike the Duren and EIP studies set forth above, the SWICS studies do not suffer from a lack of representativeness – SWICS presents the municipal solid waste industry state-of-the-practice on LFG collection efficiency, methane oxidation, carbon sequestration, LFG generation modeling, and methane destruction efficiency in LFG control devices as they occur at landfills based upon reviewed literature. Literature was reviewed to:

- Compile and critically analyze published information on LFG collection efficiencies;
- Compile and critically analyze published information on methane oxidation;
- Evaluate carbon storage factors (CSFs) reported for MSW and individual components thereof;
- Establish the best practice methodology for modeling methane generation in landfills;
- Compile and critically analyze published information on methane destruction efficiencies for LFG-fired flares, engines, and turbines.

EPA relied on the SWICS 2012 Addendum in considering revisions to methane oxidation fractions identified within Subpart HH in the *2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantially Revised Data Elements*, 78 Fed. Reg. 71904-71981 (November 29, 2013). See *e.g.*, Review of Methane Flux and Soil Oxidation Data (Docket No. EPA-HQ-OAR-2012-0943-0015).

The SWICS White Paper is again undergoing a revision (to version 3.0), which will address several of the same data quality objectives and variables that the Agency seeks to address in the Proposed Rule. This includes a move toward a more quantified basis for GCCS collection efficiency assessment, as well as an integration of prior versions of SWICS and a revisit on the current state-of-the- practice on collection efficiencies, oxidation, carbon storage, methane generation in landfills, and destruction efficiencies. The intent of SWICS 3.0 will be to serve as a protocol under SBTi for landfill emissions reporting, for both sites with and without a GCCS. The Landfill Industry Commenters expect that the SWICS revision will be complete in 2023, and we are eager to collaborate with EPA for review and discussion of the data and methodologies considered therein. We ask EPA to delay finalization of the proposed revisions to the Subpart HH within the Proposed Rule pending completion of this process.

Response: The EPA appreciates the commenter's input. We will review version 3.0 of the SWICS white paper when it is available.

See section III.T.2 of the preamble to the final rule for the EPA's response to this comment regarding finalization of collection efficiencies.

Please see response to comment EPA-HQ-OAR-2019-0424-0319-A1, Excerpt 6 for discussion on the studies used to support the proposed revisions to subpart HH.

Commenter Name: Not provided
Commenter Affiliation: Carbon Mapper
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0324-A1
Comment Excerpt Number: 10

Comment Excerpt: EPA should also leverage the $850 million allocated through the Inflation Reduction Act's Methane Emissions Reduction Program to support annual grants and contracts for sustained third-party remote sensing. While focused on the oil and gas sector, sustained third-

party remote sensing can identify plumes across sectors and generate credible data to improve subpart HH reporting.

Response: We appreciate the commenter's suggestion; however, the EPA did not propose and is not finalizing requirements related to third party remote sensing. Therefore, this comment is out of scope for this rulemaking and the EPA is not taking final action at this time.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 16

Comment Excerpt: EPA should also leverage the $850 million allocated through the Inflation Reduction Act's Methane Emissions Reduction Program to support annual grants and contracts for sustained third-party remote sensing. While aimed at the oil and gas sector, sustained third-party remote sensing can identify plumes across sectors and generate credible data to improve subpart HH reporting.

Response: See response to comment EPA-HQ-OAR-2019-0424-0324-A1, Excerpt 10.

19.2 Comments on proposed revisions for other large release events (Equations HH–6, HH–7, and HH–8)

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA should further specify the circumstances in which the reporter would be required to exclude the f_{Dest} term, meaning the circumstances when the control device is not properly combusting. EPA should require monitoring of both the pilot light and the flow rate and should specify that f_{Dest} must be excluded during any period when the pilot light and flow rate are not meeting manufacturer specifications for complete combustion. EPA should likewise specify that f_{Dest} must be excluded during any period when the reporter has operational data indicating that the combustion device is not operating according to manufacturer specifications or when the reporter has received credible monitoring data (aerial or otherwise) showing an unlit or malfunctioning control device.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0305-A1
Comment Excerpt Number: 6

Comment Excerpt: EIP supports the recommendations set forth in the EDF July 21, 2023 Comments on how EPA can improve the indicators of periods during which the destruction system is performing poorly.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Hannah Nesser
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0306-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA limits its recommendations to GCCS landfills. I appreciate the importance of this focus as these landfills represent a large fraction of the underestimate we find in GHGRP reporting. However, we still find a median 36% increase at the 32 non-GCCS landfills considered in our work. At the City of Dothan Sanitary Landfill, which reached capacity in 2014 and is the sixth largest landfill by our accounting, our TROPOMI-informed emission estimate is a factor of six larger than the reported value. Non-GCCS landfills produce 35% of the methane emissions from the 70 landfills considered in our work. And, three of our top ten methane-emitting landfills are non-GCCS facilities. We find no correlation between our TROPOMI-informed emissions and reported values, indicating that GHGRP methods have little predictive power.

These results suggest that GHGRP estimates for non-GCCS landfills are biased low and do not account for landfill-to-landfill variability. Incorporating high emission events, particularly those from a poorly or non-operating destruction device or from a leaking cover system, could improve the predictive power of GHGRP methods. These events should be incorporated by adding a term to Equation HH–5 that accounts for emissions over and above the modeled emissions and that are not affected by oxidation. The term could be adapted to allow for the incorporation of routine surface observations, as recommended in the proposed rule, or to allow for the addition of observations triggered by external observations of high emission events (Section III(c)).

Response: We requested information on how methane monitoring technologies such as satellite imaging, aerial measurements, vehicle-mounted mobile measurement, or continuous sensor networks, might enhance subpart HH emissions reporting, and requested examples of methane data collected from available monitoring methodologies and how such data might be incorporated into subpart HH for estimating annual emissions. We will review this information for its potential applicability to the non-GCCS modeling equations in subpart HH and may consider it in a future rulemaking.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 3

Comment Excerpt: Although EPA states that the proposed changes to the definitions of f_{Rec} and f_{Dest} are intended to capture large release events, they would likely not serve that purpose and instead would add burden rather than value to landfill reporting. Most importantly, far from generating data relating to large release events, the revisions would instead tend to capture very limited and/or marginal data related to very short and otherwise typical operational periods. First, the Agency proposes revisions to the term f_{Rec}, as used in Equations HH–7 and HH–8, to exclude from the calculation of landfill gas collection system operations those circumstances in which systems may be operating "poorly" such as when pressure, temperature, or other parameters indicative of system performance are outside of normal variances. See 88 Fed. Reg. at 32877 and 32931. The Landfill Industry Commenters believe that this seemingly simple language makes little sense and will be impossible to implement in the context of a typical gas collection system, which may consist of hundreds of wells and other components. In particular, use of the term "normal variances" is misleading, because gas collection systems are dynamic rather than static and require constant adjustment, all of which are expected aspects of system operation and the very basis for EPA's selection of the work practice standards underlying the Municipal Solid Waste Landfill NSPS and NESHAP standards. In fact, pressure, temperature and other parameters are adjusted quite frequently and system components and cover are subject to frequent repairs, none of which would be expected to affect the overall collection efficiency that is otherwise taken into account within the NSPS, the NESHAP and Subpart HH. Further, with a lack of clear direction as to how to account for such periods of "poor" operation as compared to "normal variances," which concept is undefined, reporters will inevitably arrive at various means of defining these periods, thus leading to inconsistency and unreliability in reporting. Finally, reducing collection system operating hours to only include periods of "normal" operation effectively double counts the gas collected during those periods by reducing the calculated f_{Rec} value to the same extent as if the collection system were not operating, resulting in potentially significant overestimation of emissions. Accordingly, the Landfill Industry Commenters request that EPA remove the word "normally" from the first sentence and remove "or poor operation,

such as times when pressure, temperature, or other parameters indicative of operation are outside of normal variances," from the second sentence of the proposed definition of f_{Rec}.

Likewise, the proposed revision to the term f_{Dest} would attempt to define and exclude periods when the destruction device is operating "poorly" such that the calculation of annual operating hours for the destruction device should include only "those periods when flow was sent to the destruction device and the destruction device was operating at its intended temperature or other parameter indicative of effective operation. For flares, the times when there is no pilot flame present must be excluded from the annual operating hours for the destruction device." See 88 Fed. Reg. at 32878, 32931. Again, the Landfill Industry Commenters believe that this level of detail in Subpart HH reporting is neither necessary nor warranted in order to ensure that reported data is robust, and instead would tend to overcorrect a perceived problem. A large portion of landfill gas control devices are open flares, which have no parameter for monitoring effective operation other than the presence of flame. The default EPA methane destruction efficiency for open flares is 99%. Regardless of operating temperature, the destruction efficiency of enclosed flares is always as high or higher than the destruction efficiency of open flares due to residence time within the flare stack. Further, most landfill gas destruction devices, such as flares, are equipped with automatic shutoffs in the event that temperature falls below a set point, loss of flame, or other applicable parameter to ensure proper operation, and such shutdown occurs quickly to prevent prolonged periods of operation at low temperature, loss of flame, or other applicable parameter. Likewise, startup procedures are well defined and designed to proceed through the sequence deliberately and safely. While these periods are defined by manufacturers' specifications for safe operations, it would be extremely difficult to pinpoint the duration of these events on an individual or collective basis in an attempt to quantify the insignificant increased emissions during these periods. Even at low temperatures, some landfill gas destruction is occurring within the device, and therefore exclusion of these periods from the calculation would incorrectly over report GHG emissions during those periods since f_{Dest} would be calculated as if the device were free-venting the gas with no combustion during the period. (In fact, if a control device is operating with the presence of flame, virtually all methane is destroyed regardless of operating temperature – the default methane destruction efficiency for control devices is 99%, regardless of device type.) Accordingly, the Landfill Industry Commenters suggest that the definition of f_{Dest} should exclude the proposed reference to "intended temperature or other parameter indicative of effective operation."

The sentence addressing the pilot flame should also be removed from the proposed revision of f_{Dest}, because it is confusing, unnecessary, and technically incorrect. First, a pilot is not typically required to maintain combustion in landfill gas flares and is only used during the startup process. The presence of a flame, either the pilot or the main flame, shows the flare is operating and destroying gas. To prevent the unnecessary combustion of pilot fuel (typically propane), landfill gas flares do not typically run with a continuous pilot flame. Instead, the flare startup sequence starts by a spark lighting the pilot flame. After the presence of a pilot flame is confirmed, the landfill gas fail-closed valve opens, and landfill gas is introduced into the flare combustion process. After a brief period of time (usually several minutes) the pilot turns off. However, the presence of flame continues to be monitored. If the presence of flame is no longer detected, the flare shuts down and the fail-closed valve shuts to prevent venting of unburned gas. Periods where there is no flame (either pilot or main) are addressed by the first sentence of the f_{dest} definition and therefore need not be separately addressed.

We recommend removing the phrase "… as measured at the nth measurement location" from the first sentence of f_{Dest} description. This text is unnecessary and adds confusion by implying that the time gas is sent to the nth measurement location equals the time gas is sent to the control device, which is not necessarily the case when more than one control device is associated with the measurement location. Because flares and other destruction devices are designed with fail-closed valves or other devices to prevent venting of gas when they are not operating, applying the definition as written overestimates emissions when a measurement location has more than one destruction device and all devices are not operating at the same time.

Based on all of the above, the Landfill Industry Commenters suggest the following definition of f_{Dest}:

Fraction of hours the destruction device associated with the nth measurement location was operating during active gas flow calculated as the annual operating hours for the destruction device divided by the annual operating hours flow was sent to the destruction device. If the gas is transported off-site for destruction, use $f_{dest,n} = 1$. If the volumetric flow and CH_4 concentration of the recovered gas is measured at a single location providing landfill gas to multiple destruction devices (including some gas destroyed on-site and some gas sent off-site for destruction), calculate $f_{dest,n}$ as the arithmetic average of the fdest values determined for each destruction location with that measurement location.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Morton Barlaz
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0286-A1
Comment Excerpt Number: 1

Comment Excerpt: I take issue with the statement that:

"Presently, Equations HH-6 and HH-8, which are used to quantify CH_4 emissions from controlled landfills, do not account for fugitive CH_4 emissions from cover system leaks."

Estimates of CE have always been just that - "an estimate." Ultimately, the estimates are based on engineering judgement given the complexity of measuring CE and the paucity of data. Estimates of CE have always had cracks embedded in the estimate. The fact that there are cracks in a landfill's cover soil is one reason why we do not use >90% CEs, even for a site with a good soil cover with no visible cracks, good well density, and good operations. (Of course, on a site-specific basis, higher CEs may be achieved.) To add an adjustment for cracks is to take a number (CE) which is already uncertain and add another number that is even more uncertain. Adding an additional factor for cracks does not make sense given that consideration of cracks is embedded in the original CE.

EPA should also recognize that estimates represent averages across all landfills. Some landfills will have higher and lower actual CEs. As such, the defaults should not represent upper limits. Some landfills may be able to demonstrate better than average CE.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Morton Barlaz
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0286-A1
Comment Excerpt Number: 4

Comment Excerpt: If EPA thinks that there are conditions under which the OX term in HH-6 is too high, then I would encourage EPA to propose lower OX levels under well-defined conditions. I would similarly encourage EPA to specify cases where oxidation efficiencies greater than 35% are appropriate as higher oxidation efficiencies are well documented (Chanton et al., 2011). I think that by further modifying HH-6, EPA is taking an equation that already has some uncertainty and increasing the uncertainty. I recognize that the addition to HH-6 incentivizes operators to reduce surface emissions but as set up, a concentration of 450 ppm leads to no change in HH-6 while a concentration of 503 ppm leads to an increase in emissions. A simpler approach would be to lower OX as a function of surface emission concentrations. As proposed, there is something very important about 500 ppm when in fact any number above 0 means that there are methane emissions and there is nothing special, from a technical perspective, about 500 ppm.

The same argument applies to the proposed modifications to HH-7 and HH-8. I would much prefer that EPA simply mandate lower CEs when there is evidence of an abnormal number of exceedances or high surface concentrations of methane. Of course, if EPA lowers the CE for landfills with a high number of exceedances, then EPA should raise the CE for landfills with limited or no exceedances. As above, the difference between 450 ppm and 503 ppm is small but EPA is proposing a step change in the emissions calculations. As stated above, from my perspective, the CE has always included the fact that there is some gas escaping through cracks.

References

Chanton, J., Abichou, T., Langford, C., Hater, G., Green, R., Goldsmith, D. and N. Swan, 2011, "Landfill methane oxidation across climate types in the U.S.," Env. Sci. Technol., 45, p.313 – 9.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 5

Comment Excerpt: Citing an aerial study by Duren, et.al as a basis for its proposal, the Agency noted in its preamble that the proposed revisions to Subpart HH in the Proposed Rule would account for "methane emissions from large release events that are currently not quantified under the GHGRP." 88 Fed. Reg. at 32877; Duren, R.M. et.al., 2019: California's Methane Super-Emitters," Nature 575, 180-184, 7 November 2019. The Agency identified three potential causes for large releases of methane: 1) a poorly operating or non-operating gas collection system; 2) a poorly operating or non-operating destruction device; and 3) a leaking cover system due to cracks, fissures, or gaps around protruding wells. Id. Notably, EPA's own Technical Support Memo acknowledges that:

It is important to note that only landfills with anomalous emissions could be quantified by the aerial methods used by Duren, et al., (2019) and that these emissions only occurred at 7 percent of the surveyed landfills. However, when these anomalous emissions occur, the CH_4 emissions reported to the EPA under Subpart HH are consistently lower than the measured emission rates extrapolated to annual estimates……. Because the California aerial study of Duren, et al., (2019) could not quantify the emissions from 93% of the landfills that did not have anomalous emissions, this study does not provide evidence that the Subpart HH methodologies are inaccurate or unbiased under typical conditions that exist for most landfills.

Memo from Liz Goodiel to Docket ID No. EPA-HQ-OAR-2019-0424, Technical Support for Supplemental Revisions to Subpart HH; Municipal Solid Waste Landfills, at p. 3. In addition to this express limitation acknowledged by EPA, its analysis of the California aerial surveys fails to take into account the large percentage of landfills for which the aerial surveys did not detect anomalous emissions. The Landfill Industry Commenters also agree with and incorporate by reference the observations made by Morton Barlaz, in his review of the Duren paper and associated Agency conclusions, set forth in a comment letter submitted separately to the rulemaking docket. Barlaz's observations include, importantly, that EPA fails to identify all of the factors that can affect collection efficiency, such as type of cover and well density. As such, the Agency's proposal for adjustments to reporting do not fully capture all of the factors affecting overall collection efficiency, which is already subject to numerous assumptions and qualifications under Subpart HH. Further, EPA's reliance on the California aerial studies in determining the need for rule revision does not appear to comport with its General Assessment Factors; in particular, the soundness of the assumptions and conclusions arising from that study and their application across the landfill sector, as well as the level of completeness of the data set for the purposes intending to be served.

Specifically, the California aerial surveys do not correlate identified plumes with anecdotal periods of GCCS system maintenance, construction, or other downtime event - events that would already be captured in the current f_{Rec} and f_{Dest} methodologies. It is therefore likely that at least

some of the anomalous events surveyed were already captured in GHGRP submissions. Second, the California aerial surveys do not determine whether identified plumes are from the same release event for different overpasses, which are frequently on the same day – leading to reliability questions for the calculated "Persistence" when trying to inform changes to annual emissions reporting methodologies. These two points lead the Landfill Industry Commenters to question whether the "anomalous emissions" identified are actually exclusive to the emissions estimates reported through GHGRP. Further, the Landfill Industry Commenters point to the Duren paper's Supplemental Table 5, in which 4 of 30 "landfill – 4A1 Managed Waste Disposal Sites" have a calculated emissions rate less than the GHGRP reporting threshold of 114 kg/hr (1,000 metric tons / annum). The Landfill Industry Commenters view these relatively low detection and quantification levels as casting doubt on the theory that diffuse area emissions cannot be detected by this methodology – at least for sites that report much larger calculated emissions through Subpart HH calculations. Given that the extrapolating of the aerial surveys' calculated emissions rates to whole-year emissions amounts is inappropriate due to diurnal and seasonal variation, one would still expect aerial survey to find methane plumes from areas susceptible to methane emissions already identified by Subpart HH methodologies (areas with only daily cover, areas with no GCCS, etc.). These plumes would then need to be subtracted from the "anomalous emissions" to determine exclusive, additional emissions – a calculation step not explored by the Duren paper. The calculated emissions rates fall within the reported range of GHGRP emissions rates and therefore don't present clear evidence that the emissions are actually anomalous. Further, for the 93% of landfills that were not identified as having persistent plumes, the paper cannot determine any emissions rate, neither in comparison to GHGRP reporting thresholds nor GHGRP reported emissions – a key consideration given the proposed changes affecting the entire Subpart HH sector. Lastly, the Duren paper generates individual source uncertainties ranging from +/- 4% to +/-95%, which they comment is consistent with "the theoretical best-case performance of 15-50% uncertainty for an equivalent precision instrument and ideal plumes…" The Landfill Industry Commenters do not believe these ranges comport with the General Assessment Factors.

Response: While we agree and have stated that the California study data does not provide evidence that the Subpart HH methodologies are inaccurate or biased under typical conditions that exist for most landfills, we find that certain emission events are not well characterized by the existing reporting methodologies under subpart HH. EPA has the regulatory authority to revise the requirements in subpart HH to more effectively estimate emissions from unaccounted for emission events.

Please see section III.T.2 of the preamble to the final rule for discussion on finalizing revisions to the f_{Rec} and f_{Dest} methodologies.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 6

Comment Excerpt: We believe that the Agency would exceed its legal authority under Section 114 of the Clean Air Act and/or would contravene its own data quality and decision-making standards if certain aspects of the Proposed Rule are finalized. In short, the Agency is considering changes to Subpart HH of Part 98 that will not further its goals, and are based on data and conclusions that are unsupported by the scientific literature. As explained further herein, the Agency has proposed changes that would tend to overcorrect perceived gaps or undercounting of methane emissions from municipal solid waste landfills based on limited datasets and critical assumptions underlying third-party studies of landfills located in California and Maryland. As further described herein, we do not believe that those observations are representative of the municipal solid waste landfill sector as a whole, and are not an appropriate basis for Agency decision-making.

The Proposed Rule does not meet EPA's data quality and scientific standards, and thus cannot be supported as an appropriate exercise of EPA's rulemaking authority under Section 114 of the Clean Air Act. Indeed, EPA repeatedly states in the preamble to the Proposed Rule that the purpose of the proposal is to improve the quality and consistency of the rule and to provide for the collection of improved data under the GHGRP. See, *e.g.*, 88 Fed. Reg. at 32852. EPA's proposal in some instances is based on externally generated data and assumptions that do not meet EPA's standards for scientific and technical information which it may rely upon, and therefore are not well founded. For example, EPA's Summary of General Assessment Factors For Evaluating the Quality of Scientific and Technical Information (June 2003) (available at https://www.epa.gov/sites/default/files/2015-01/documents/assess2.pdf) (hereinafter "General Assessment Factors") established five factors for the Agency's evaluation of externally generated information: 1) soundness - the extent to which the scientific and technical procedures, measures, methods or models employed to generate the information are reasonable for, and consistent with, the intended application; 2) applicability and utility - the extent to which the information is relevant for the Agency's intended use; 3) clarity and completeness - the degree of clarity and completeness with which the data, assumptions, methods, quality assurance, sponsoring organizations and analyses employed to generate the information are documented; 4) uncertainty and variability - the extent to which the variability and uncertainty (quantitative and qualitative) in the information or in the procedures, measures, methods or models are evaluated and characterized; and 5) evaluation and review - the extent of independent verification, validation and peer review of the information or of the procedures, measures, methods or models. An evaluation of the General Assessment Factors in the context of the studies and data cited in support of the Proposed Rule, as detailed below, demonstrate that EPA must expand its review of data and then allow stakeholders to review such information prior to finalizing the Proposed Rule provisions addressing municipal solid waste landfills.

EPA's Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information by the Environmental Protection Agency (October, 2002) (available at https://www.epa.gov/sites/default/files/2020-02/documents/epa-info-quality-guidelines_pdf_version.pdf) (hereinafter "Integrity of Information Guidelines") require the Agency to ensure and maximize the quality of information that EPA disseminates. A key element of the Integrity of Information Guidelines is EPA's Peer Review Policy, which provides

that major scientifically and technically based work products (including scientific, engineering, economic, or statistical document) related to Agency decisions should be peer-reviewed. EPA's Peer Review Handbook (4th Edition 2015) (available at https://www.epa.gov/sites/default/files/2020-08/documents/epa_peer_review_handbook_4th_edition.pdf) establishes guidance for implementing the policy. President Biden's Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking (Biden, 2021) (available at https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/memorandum-on-restoring-trust-in-government-through-scientific-integrity-and-evidence-based-policymaking/) announced the policy of the Biden Administration to make evidence-based decisions guided by the best available science and data, stating that *[w]hen scientific or technological information is considered in policy decisions, it should be subjected to well-established scientific processes, including peer review where feasible and appropriat*e.

The Landfill Industry Commenters are concerned that the Agency's reliance on externally generated data and information that is incomplete and has not been peer reviewed, fails to comport with EPA's own standards and policies for scientific data, and will undercut its otherwise worthy objectives for GHGRP reporting by municipal solid waste landfills under Subpart HH. The Agency appears to be adding complexity and burden to the reporting scheme, without a showing of a commensurate or greater benefit in terms of data accuracy or completeness. Subpart HH affected sources are already subject to considerable conservatism reporting under the existing program – the added obligations set forth in the Proposed Rule would unreasonably add to that conservatism in a manner that will tend to overestimate emissions at the expense of reporters.

Response: We disagree that the proposed rule does not meet EPA's data quality and scientific standards. We included the peer-reviewed research Duren et al. (2019) and Heroux, et al., (2010) in the development of the proposed additional term for capturing surface emissions leaks.

Both studies used to support the proposed revisions to emissions and generation equations, HH–6, HH–7, and HH–8, were both peer-reviewed and published in reputable scientific journals. The Duren et al. (2019) study was published in Nature, and the Heroux, et al., (2010) research paper, the source for the flux equation was published in the Journal Air & Waste Management Association.

We found the Heroux, et al., (2010) source to be an applicable and sound study by which to estimate methane flux from surface methane concentrations. The study used well-established (sound) methods. The study used methane concentration measurements as 6 centimeters (2.4 inches) above ground level over a wide range of concentrations, consistent with surface concentration measurements made under the landfill NSPS (applicability and utility). The study provided clear discussion of the methods and procedures used (clarity and completeness). While there was significant variability at the low concentration range, the variability in the data at concentrations above 500 ppmv were limited and the correlation equation R^2 over the complete range of data was 0.9188 (acceptable uncertainty). The study was published in a peer-reviewed journal, the *Journal Air & Waste Management Association* (acceptable evaluation and review).

We also reviewed a study by the Environmental Integrity Project (EIP), *Greenhouse Gas Emissions from Maryland's Landfills* (2020), alongside existing methodologies in subpart HH to

propose a new set of gas collection efficiencies in Table HH–3 to subpart HH. The EPA is not finalizing at this time a lower set of collection efficiencies for voluntary systems. We disagree that the landfill methods are already subject to considerable conservatism under the subpart HH reporting requirements. We consider that the gas collection efficiencies are likely idealized and we are finalizing revisions based on comments received and review of studies cited by commenters, that we determined will more accurately account for periods when the gas collection efficiency may be less that the idealized defaults.

Commenter Name: Patrick Serfass
Commenter Affiliation: American Biogas Council (ABC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0313-A1
Comment Excerpt Number: 5

Comment Excerpt: Some landfill industry organizations call into question the extrapolation of two non-peer-reviewed studies (one in California and the other in Maryland) used as the basis for national regulatory policy. We would not object to the EPA being party to additional peer-reviewed research about methane emissions at municipal solid waste landfills prior to enacting the regulatory reforms proposed here.

Response: See response to comment EPA-HQ-OAR-2019-0424-0319-A1, Excerpt 6.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 13

Comment Excerpt: The Landfill Industry Commenters offer specific comments on the proposed equation terms as follows:

- dM Leak duration: EPA offers no justification for assuming that the duration of surface emissions exceedances extend back to the prior monitoring event. This assumption significantly overestimates the resulting GHG emissions.
- 0.0000284 Correlation factor: support for this value and its application is lacking as noted in the observations noted above.
- EPA offers no basis for multiplying the new surface emission measurement term [0.0000284 x dm x Sm] by the oxidation factor OX in HH-6, and why a similar application is not provided in HH-7 and HH-8.

Response: The EPA appreciates the commenter's input on the proposed equation terms for emissions Equations HH–6, HH–7, and HH–8. EPA is not finalizing the surface emission monitoring correction term at this time and may consider the comments in a future rulemaking.

Commenter Name: Not provided
Commenter Affiliation: Carbon Mapper
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0324-A1
Comment Excerpt Number: 5

Comment Excerpt: Paralleling the subpart W proposal for "other large release events," EPA should require additional reporting in subpart HH to account for large point source emissions that may be missing from or not fully captured by existing reporting methods. EPA should require reporting of all credible information available to landfill operators that identifies point source emissions at the landfill exceeding 100 kg/hr. Credible information would include data from monitoring conducted by the operator that the operator has chosen to make public or data collected by other parties that has been shared with the operator and made publicly available. All data must be generated using validated and peer-reviewed technologies and quantification approaches.

Emissions events exceeding 100 kg/hr should be reported under a separate category and quantified using the best available data. As with subpart W, we recommend EPA assume large release events are emitting for a 182-day period, or since the most recent monitoring survey that confirms the source was not emitting. EPA can use the same requirements for landfills as under subpart W in terms of calculation methods, reporting requirements, and verification of third-party notifiers.

To incorporate emissions quantified in the large release category into annual reports, EPA should review operator reports and available activity data to determine whether observed large release events should be: (a) directly added to the operator's annual emissions (*e.g.*, a large release event from the active working face not covered by SEMs), (b) used to revise up the operator's annual emissions (*e.g.*, a large release partially but not fully accounted for in SEM exceedances), or (c) published in a separate category with an explanation of the event but not added to the operator's annual GHGRP-reported emissions (as the operator is determined to have adequately accounted for the large release event through existing reporting methods).

EPA can use reported point source data to identify categories of major emissions sources that are not captured by or not accurately represented by current GHGRP reporting models. EPA can use this information to expand model parameters and improve model accuracy over time. Parameters can also be adjusted as repeated observations are made across seasons and across a representative population of landfills (*e.g.*, geographies, climate zones, size, design, GCCS type, etc.) in order to capture the expected variability in emissions.

In order to aid EPA in assessing the cause of "other large release events" and the likelihood of double counting emissions, it is recommended that EPA require reporting of additional activity

data including construction periods and locations, type of GCCS and combustion devices, any use of automated well tuning, monitoring methods used (including non-regulatory, voluntary monitoring), and cover types used. We also recommend that SEMs measurements be made publicly available for download similar to other input data for GHGRP reporting. This will aid both EPA and the scientific community in assessing the ability of proposed SEMs-based methods to accurately quantify large release events.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 7

Comment Excerpt: Paralleling the subpart W proposal for "other large release events," EPA should require additional reporting in subpart HH to account for large point source emissions that may be missing from or not fully captured by existing reporting methods. EPA should require reporting of large release events whenever credible information of such an event is available to the landfill operator showing emissions exceeding 100 kg/hr. Credible information triggering the obligation to report large releases would include data from monitoring conducted by the operator or data collected by other parties that has been shared with the operator and made publicly available (*e.g.*, satellite detections). All data generated using validated and peer-reviewed technologies and quantification approaches should be considered credible. Emissions events exceeding 100 kg/hr should be reported under a separate category and quantified by reporters using the best available data and methods. As with subpart W, we recommend EPA assume large release events are emitting for a 182-day period, or since the most recent monitoring survey that confirms the source was not emitting. EPA can use the same requirements for landfills as under subpart W in terms of calculation methods and reporting requirements.

To incorporate emissions quantified in the large release category into annual reports, EPA should review operator reports and available activity data during the GHGRP verification process to determine whether observed large release events should be: (a) directly added to the operator's annual emissions (*e.g.*, a large release on the active working face not captured by existing models); (b) used to revise the operator's annual emissions (*e.g.*, a large release partially but not fully accounted for in SEM exceedances, GCCS downtime assumptions, or control device assumptions); or (c) published in a separate category with an explanation of the event but not added to the operator's annual GHGRP-reported emissions (as the operator is determined to have adequately accounted for the large release event through existing reporting methods).

Over time, EPA can use reported point source data to identify categories of major emissions sources that are not captured by or not accurately represented by current GHGRP models. EPA

can use this information to expand model parameters and improve model accuracy over time. Parameters can also be adjusted as repeated observations are made across seasons and across a representative population of landfills (*e.g.*, geographies, climate zones, size, design, GCCS type, etc.) in order to capture the expected variability in emissions.

In order to aid EPA in assessing the cause of "other large release events" and the likelihood of double counting emissions, we recommended that EPA require reporting of additional activity data including construction periods and locations, type of GCCS and combustion devices, any use of automated well tuning, wellhead monitoring data, monitoring methods used (including non-regulatory, voluntary monitoring), and cover types used. We also recommend that SEMs measurements be made publicly available for download similar to other input data for GHGRP reporting. This will aid both EPA and the scientific community in assessing the ability of proposed SEM-based methods to accurately quantify large release events.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 18

Comment Excerpt: Nesser et al. finds emissions much higher (in some cases by an order of magnitude) than what is reported to EPA and primarily attributes this discrepancy to subpart HH's failure to account for site-specific factors, like construction. For example, at the South Shelby Landfill in Tennessee, subpart HH emissions were 4.1 Gg a-1 while Nesser et al. found emissions of 41 (30 – 56) Gg a-1, an order of magnitude larger. The authors believe this divergence is attributable to the construction of a landfill gas pipeline injection facility at South Shelby that began in 2019 and now produces the equivalent of more than 33,000 gallons of gasoline per day. The South Side Landfill in Indiana displayed similarly high emissions that the authors also attribute to a landfill gas project. This type of information is unaccounted for under subpart HH and may be the driver of significant underreporting. Another example is the West Miramar Sanitary Landfill in California. The subpart HH estimate is 6.2 Gg a-1 while Nesser et al. estimate emissions of 24 (22 – 25) Gg a-1. This landfill is being investigated for a well leak where methane concentrations of 8662 ppm were recorded in November 2019. Also in California, the Newby Island Landfill reported emissions of 5.5 Gg a-1 while Nesser et al. find emissions of 15 (13 – 21) Gg a-1. This landfill has received 30 violation notices from 2014 to 2020, including for gas collection system shutdowns.

Based on this information, we urge EPA to require reporting on site-specific attributes, including both 1) construction projects and 2) compliance issues, which may drive major discrepancies between reported and actual emissions. With this information, EPA would be able to follow up

with reporters and require revisions and corrections to reported emissions. For example, if a landfill reported that it was undertaking a major construction project on a portion of the landfill, EPA could require adjustments to the reported data to account for periods of time in which the GCCS may have been turned off or not functioning to allow construction. If a landfill reported that it was subject to an enforcement action for cracks or not operating the GCCS, EPA could use information from the enforcement action, like the period of time the GCCS was not operating or the number and size of cracks, to require revisions to reported emissions.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Hannah Nesser
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0306-A1
Comment Excerpt Number: 3

Comment Excerpt: Construction events appear to be a significant source of emissions both in our work and in other studies that use higher-resolution aerial observations (*e.g.*, Duren et al., 2019, Cusworth et al., 2020). In our work, two of the three largest methane-producing landfills completed large GCCS construction projects in the study year (Section I). Duren et al. (2019) found large emissions originating from incomplete landfill gas transport features in aircraft observations from the AVIRIS-NG instrument. Cusworth et al. (2020) found emissions originating from an incomplete landfill gas cell that represented a third of the GHGRP daily emission rate using the same instrument.

EPA should add construction events as a fourth high-emission event category. EPA should require reporting of such construction events, including information on the type of infrastructure being installed and the duration of the construction event. In the case of GCCS installation, EPA should also require that operators report the anticipated volume of gas that will pass through the equipment. Where possible, EPA should also adjust required monitoring to better survey emissions at construction sites. Along with external observations (Section III(c)), these data could be used to better understand the sources of methane leaks during construction, allowing EPA to update GHGRP methods accordingly.

References

Cusworth, D.H., R.M. Duren, A.K. Thorpe, E. Tseng, D. Thompson, A. Guha, S. Newman, K.T. Foster, and C.E. Miller: Using remote sensing to detect, validate, and quantify methane emissions from California solid waste operations, *Environ. Res. Lett. 15*, 054012. DOI: 10.1126/sciadv.abn9683, 2020.

Duren, R.M., A.K. Thorpe, K.T. Foster, T. Rafiq, F.M. Hopkins, V. Yadav, B.D. Bue, D.R. Thompson, S. Conley, N.K. Colombi, C. Frankenberg, I.B. McCubbin, M.L. Eastwood, M.

Falk, J.D. Herner, B.E. Croes, R.O. Green, and C.E. Miller: California's methane super-emitters, *Nature 575*, 180–184 https://doi.org/10.1038/s41586-019-1720-3, 2019.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

19.3 Comments on use of surfacing monitoring measurements for NSPS and EG landfills

Commenter Name: Not provided
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0305-A1
Comment Excerpt Number: 4

Comment Excerpt: While EIP is supportive overall of EPA's proposal – because this is the most logical approach for establishing an indicator of cover leaks base on existing monitoring requirements -– we feel compelled to point out its significant shortcomings. The existing surface emissions monitoring requirements in the NSPS provide only snapshots of methane levels for brief moments on the landfill's surface. The current requirements were not designed to capture leaks in a way that can be estimated as an annual value. Monitoring must be conducted quarterly rather than continuously, which will result in some leaks being missed. Measurements must be taken at 100-foot intervals on the landfill's surface, rather than the tighter spacing required by California and other states, which require 25-foot intervals.[42] In fact, an analysis of leaks detected using California's walking path shows that it identified more leaks than when surface emissions monitoring was conducted based on NSPS requirements. [43]

EPA's section 111 rules also do not require adjustment for meteorological information – especially barometric pressure – that has a direct impact on surface methane concentrations.[44] EPA should not use surface emissions monitoring values as indicators of cover leaks unless those measurements are accompanied by data demonstrating typical barometric pressure conditions were present at the site during monitoring. Finally, EPA has not established that an exceedance of 500 ppm is a more meaningful indicator of a leak than an exceedance of a lower threshold. In fact, the California Air Resources Board ("CARB") is considering revising its landfill methane rules to establish a threshold for corrective action that is lower than 500 ppm.[45]

Footnotes

[42] See, *e.g.*, Cal. Code Regs. tit. 17 § 95471(c)(1)(B) (California); Or. Admin. R. 340-239-0800(3)(a)(A) (Oregon).

[43] At landfills where surface emissions monitoring was conducted according to both NSPS and California's requirements, about 60% of landfills (n=29) show exceedances only under the California approach or greater exceedances with the California approach. Specifically, seven landfills showed exceedances only under the California approach; ten showed greater exceedances under the California approach; four show lower exceedances under the California approach; and eight show no exceedances under either approach. Further, for those landfills with greater exceedances under the California state rule, exceedances were on average 180% more frequent. Eastern Research Group, Memorandum to Hillary Ward, U.S. EPA, OAQPS, Sector Policies and Programs Division and

Docket EPA-HQ-OAR-2014-0451 re: Analysis of Surface Exceedances from California Landfills under the New Source Performance Standards and the California Landfill Methane Rule (July 2015) at 2.

[44] James L. Hanson & Nazli Yesiller, Cal. Polytechnic State Univ., Estimation and Comparison of Methane, Nitrous Oxide, and Trace Volatile Organic Compound Emissions and Gas Collection System Efficiencies in California Landfills 22 (2020), https://ww2.arb.ca.gov/sites/default/files/2020-06/CalPoly%20LFG%20Flux%20and%20Collection%20Efficiencies%203-30-2020.pdf; Liukang Xu, et al., Impact of Changes in Barometric Pressure on Landfill Methane Emission, 28 Glob. Biogeochemical Cycles 679, 685(2014), https://doi.org/10.1002/2013GB004571; Env't and Climate Change Can., Estimating, Measuring and Monitoring Landfill Methane-Technical Guidance Document 34 (last updated Apr. 17, 2023), https://drive.google.com/file/d/1fqods0nXDSEUEmZu7nnkHZwXfGtemWPr/view?usp=sharing at 30.

[45] CARB, Public Hearing, https://www.youtube.com/watch?v=DCmTxns_s-0 (May 18, 2023) time stamp 29:00.

Response: The EPA appreciates the commenter's input and support for the proposed inclusion of reporting surface emissions monitoring data under subpart HH. The proposed term and method to account for leak duration assume that the emissions identified during the monitoring survey are representative of the average emissions that occurred during the time period since the last monitoring survey. As pointed out by the commenter, the EPA recognizes that the proposed reporting methodology is not perfect and does not capture all emissions from cover leaks. EPA has decided not to finalize the reporting of surface emissions monitoring in subpart HH at this time. We will review your recommendations for improving reporting of large release events from surface cracks and may consider them in a future rulemaking.

Commenter Name: Not provided
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0305-A1
Comment Excerpt Number: 5

Comment Excerpt: While we believe that inclusion of surface emissions monitoring data will improve EPA's current GHGRP methods, it is almost certain that cover leaks will remain underestimated even after this change is finalized. To address this, EPA should revise its CAA section 111 rules to require monitoring that is more representative of site emissions, including cover leaks. Among the changes that should be made are the following, which would provide more representative information about cover leaks and the performance of the collection system:

- Instantaneous surface emission monitoring using a walking pattern of no more than 25-foot intervals. Integrated surface emission monitoring within 50,000 square foot grids across the entire landfill. Integrated (averaged) surface measurements with lower threshold (state threshold is 25 ppm).[46]

- If there are no exceedances recorded for four consecutive quarterly monitoring periods, the walking pattern may be increased to 100-foot intervals. Upon detection of any exceedance within the landfill that cannot be remediated within 10 days, the walking pattern would revert to 25-foot intervals.
- Monitoring must be conducted when barometric pressure is representative of normal site conditions.[47]

In addition, EPA should support the development of continuous monitoring methods that can accurately quantify annual methane and other emissions from landfills based on monitored, rather than modeled, data.

Footnotes

[46] California, Oregon, and Maryland require a walking pattern with no more than 25-foot intervals. Cal. Code Regs. tit. 17 § 95471(c)(1)(B) (2010); Or. Admin. R. 340-239-0800(3)-(a)(B) (2021).

[47] Wellheads are operated with respect to atmospheric pressure. Therefore, short-term variability in the local pressure can impact the effectiveness of the GCCS, where the vacuum pressure is set monthly, and thus impacts surface emissions. Emissions decrease when atmospheric pressure rises and increase when the pressure falls. James L. Hanson & Nazli Yesiller, Cal. Polytechnic State Univ., Estimation and Comparison of Methane, Nitrous Oxide, and Trace Volatile Organic Compound Emissions and Gas Collection System Efficiencies in California Landfills 22 (2020), https://ww2.arb.ca.gov/sites/default/files/2020-06/CalPoly%20LFG%20Flux%20and%20Collection%20Efficiencies%203-30-2020.pdf; Liukang Xu, et al., Impact of Changes in Barometric Pressure on Landfill Methane Emission, 28 Glob. Biogeochemical Cycles 679, 685(2014), https://doi.org/10.1002/2013GB004571.

Response: See response to comment EPA-HQ-OAR-2019-0424-0305-A1, Excerpt 4.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 7

Comment Excerpt: The methodologies set forth in EPA Technical Support Memo do not adequately capture the complexity of the attempted correlation between surface emission exceedances and methane flux. The Technical Support Memo cites two studies, and relies on one study (Heroux, et.al.) which describes an analysis (by Fécil, et al.) conducted using a dynamic flux chamber covering a surface area of 0.2 m2 over 20 years ago at one landfill in Canada. See Technical Support Memo at p. 9. Looking at Figure 6 in the original paper by Fécil, et al., one can see in that there are exactly 6 data points defining the relationship between flux and surface concentration above 500 ppm. No justification is provided for extrapolating the relationship between flux and near surface methane concentration observed in 0.2 m2 area to an area at a typical landfill that may be 4,500 times larger. Further, EPA's Technical Support Memo states

"The SMCM are conducted every 30 meters, so each measurement location represents a 900 m^2 area (30 m × 30 m)." Technical Support Memo at p. 9. While the spacing between surface emission monitoring walking paths is 30 m, measurements are taken continuously while walking along the path. Further, it is unclear why a square area has been chosen (rather than, for example, a circle) and how the proposed approach would be applied in practice where there may be separate exceedances detected in close proximity to each other. Given that the majority of SEM exceedances occur at cover penetrations or cracks, any associated emissions would be expected to be much more localized and occur over an area much less than 900 m^2. The area of a typical vertical gas well boring (about 0.7 m) would better represent the majority of SEM exceedances.

There are several other studies that EPA should consider in this context, all of which show significant variability in any such attempted correlation and would cast doubt on EPA's reliance on a singular study and limited data set. *See e.g*. Abedini, A. R. 2014. *Integrated approach for accurate quantification of methane generation at municipal solid waste landfills*. Ph.D. thesis, Dept. of Civil Engineering, Univ. of British Columbia; Abichou, T., J. Clark, and J. Chanton. 2011. *Reporting central tendencies of chamber measured surface emission and oxidation*, Waste Manage.(Oxford) 31: 1002–1008. https://doi.org/10.1016/j.wasman.2010.09.014; Fécil, B., M. Héroux, and C. Guy. 2003. *Development of a method for the measurement of net methane emissions from MSW landfills*; In Proc., Sardinia 2003, 9th Int. Landfill Symp. Cagliari, Italy: CISA Publisher; Lando, A. T., H. Nakayama, and T. Shimaoka. 2017 *Application of portable gas detector in point and scanning method to estimate spatial distribution of methane emission in landfill*, Waste Manage. (Oxford) 59: 255–266. https://doi.org/10.1016/j.wasman.2016.10.033; Hettiarachchi, H., Irandoost, E., Hettiaratchi, J. P., and Pokhrel, D. 2023. *A Field-Verified Model to Estimate Landfill Methane Flux Using Surface Methane Concentration Measurements under Calm Wind Conditions*, J. Hazard. Toxic Radioact. Waste: 27 https://doi.org/10.1061/JHTRBP.HZENG-1226.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Morton Barlaz
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0286-A1
Comment Excerpt Number: 3

Comment Excerpt: I am surprised that EPA did not look at the work of Tarek Abichou. Dr. Abichou has worked on relationships between surface emissions and surface concentration measurements (see Estimation of fugitive landfill methane emissions using surface emission monitoring and Genetic Algorithms optimization, Waste Management 2018, V. 72, page 313-328 and "Estimation of landfill methane emissions using stochastic search methods," Atmospheric Pollution research, 2017, Vol. 8, N. 4, p. 597-605.)

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Hannah Nesser
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0306-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA should require additional reporting to account for large emission events that may not be captured by existing reporting methods. This reporting could follow the Subpart W proposal for "other large release events." EPA should require reporting of large emission events whenever credible information is available to the operator suggesting emissions larger than 100 kg/hr. These emission events are likely to represent a significant fraction of total point source emissions (Duren et al., 2019). In addition to data provided by the landfill operator, observations from aircraft or satellites should be considered credible when the methods used to identify and quantify the emission event are validated and peer-reviewed and when the observation can reasonably be attributed to the landfill. For example, Schuit et al. (2023) demonstrated that data from the TROPOMI satellite instrument can be used to reliably identify high-emission events, while higher-resolution satellite instruments can provide information on the source and emission rate. In addition to improving short-term emission estimates, these data could be used to improve GHGRP emission estimate methods in the future by improving our understanding of the causes of high-emission events.

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Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

19.4 Comments on other methane monitoring technologies that may be used for estimating emissions

Commenter Name: Eric Choi
Commenter Affiliation: GHGSat Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0291-A1
Comment Excerpt Number: 1

Comment Excerpt: Satellite imaging is an existing, operational, and cost-effective monitoring methodology for measuring methane emissions from landfills that would not only enhance Subpart HH emissions estimates but could in fact eliminate the need for estimation entirely by providing actual quantitative emissions data to both regulators and operators. GHGSat currently has nine satellites in space and will be adding another three before the end of this year. With its current number of operational satellites, GHGSat is capable of making whole site methane concentration and emission rate measurements of any landfill in the United States every two or three days. GHGSat's satellites have a spatial resolution of less than 30 meters and a methane emission detection threshold of 100 kg/hr. These capabilities are consistent with the requirement in Subpart HH for landfill owners or operators to monitor surface methane along a pattern that traverses the landfill at 30 meter intervals for each collection area on a quarterly basis, with any methane concentration reading of 500 parts per million (ppm) or more over background at any location recorded as a monitored exceedance subject to corrective action.

GHGSat's technology has been employed for the detection and quantification of landfill methane emissions on behalf commercial waste management companies and government departments since the launch of its first commercial satellite in 2020. Figure 1 shows a methane observation of a landfill in California that was made by a GHGSat satellite. The observation was made on September 16, 2021 and a whole site emission rate of 450 kg/hr was measured.

[See DCN EPA-HQ-OAR-2019-0424-0291-A1 for Figure 1: Satellite observation of methane emissions from a landfill in California on page 2, images]

Satellite imaging is not a research level technology but a verified and robust monitoring methodology for measuring landfill methane emissions that is available immediately to support the requirements of Subpart HH. In October 2020, GHGSat performed a blind controlled release with TotalEnergies of France to validate the performance of a GHGSat satellite less than two weeks after its launch. Analysis of the data collected identified the precise location of the methane release and the satellite emission rate determination of 250±140 kg/hr proved to be very close to the ground truth release rate of 234 kg/hr.[6] More recently, a paper led by researchers at Stanford University reported on the single-blind validation of a GHGSat satellite achieving quantification accuracy of better than ±20% for each methane plume that was observed as part of the study.[7]

Given the seasonal nature of landfill methane emissions as documented in the scientific literature, the EPA should embrace for landfills the same tiered methane emissions monitoring approach as its proposed rulemaking for the oil and gas sector (EPA-HQ-OAR-2021-0317). In such an approach, satellites could monitor on a monthly (or even weekly) basis to capture

seasonal variations and detect large whole site emissions quickly and efficiently within a single field-of-view. Aircraft could be dispatched three times a year (*e.g.* spring, summer, and fall) with an emphasis on high-risk sites identified by satellites. Finally, ground surveys would only be needed occasionally to confirm exceedances detected by the satellites and aircraft. A recent paper documented the cost-effectiveness and efficacy of a tiered monitoring approach using GHGSat's satellite constellation and aircraft-based instruments in the oil and gas sector.[8]

Footnotes

[6] Satellite performance, https://www.ghgsat.com/en/case-studies/satellite-performance/

[7] Sherwin, E.D. et al., Single-blind validation of space-based point-source detection and quantification of onshore methane emissions. Sci Rep 13, 3836 (2023). https://doi.org/10.1038/s41598-023-30761-2

[8] Esparza, A.E. et al., Analysis of a tiered top-down approach using satellite and aircraft platforms to monitor oil and gas facilities in the Permian basin, Renewable and Sustainable Energy Reviews, Volume 178, May 2023, 113265, https://www.sciencedirect.com/science/article/pii/S1364032123001211

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Hannah Nesser
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0306-A1
Comment Excerpt Number: 1

Comment Excerpt: TROPOMI has provided daily, global observations of atmospheric column methane concentrations at up to 5.5 x 7 km^2 nadir pixel resolution since its launch in October 2017. In Nesser et al. (2023), we use these observations to quantify annual methane emissions and their uncertainties at ≈25 km × 25 km resolution across the contiguous United States for 2019. We find landfill emissions of 6.9 (6.4 – 7.5) Tg a^{-1}, 51% higher than the 2023 EPA Greenhouse Gas Inventory (GHGI) estimate for 2019, which is based on GHGRP emissions. Here and elsewhere, the error ranges are provided by an ensemble of emission estimates representing uncertainty in the parameters used for the analysis. We compare our TROPOMI-informed emissions to GHGRP values for the 73 landfills where we find quality information from the TROPOMI observations, where the landfill reports 2.5 Gg a^{-1} of methane or more to the GHGRP, and where landfill emissions are the dominant methane emission source in the grid cell according to a gridded version of the GHGI. In this comment, I also exclude three industrial waste landfills. The remaining 70 landfills represent 14% of our total TROPOMI-informed landfill emissions. We find good agreement with emissions inferred from aircraft studies at landfills where operational conditions were similar between the periods of study.

The TROPOMI-informed landfill methane emissions are on median 77% larger than GHGRP reports at these sites, with a median 204% increase at GCCS facilities and a median 36%

increase at non-GCCS facilities. We find no correlation ($R^2 = 0.0$) between our emissions and GHGRP reporting, which persists when we consider only GCCS or non-GCCS facilities. This suggests that current GHGRP methods have little predictive power. We attribute the discrepancy to (1) overestimated collection efficiencies at GCCS landfills and (2) under-accounting of site-specific operational changes at GCCS and non-GCCS landfills alike.

We calculate GHGRP and TROPOMI-informed collection efficiencies at 38 GCCS facilities using recovered methane reported to the Landfill Methane Outreach Program (LMOP) together with either GHGRP or TROPOMI-informed emissions, respectively. We find a mean GHGRP collection efficiency of 0.61 that is much lower than the 0.75 GHGRP default and corresponds, approximately, to the 0.60 collection efficiency provided for facilities with daily soil cover and active gas collection over the entirety of the landfill surface (Table HH–3). This is the lowest collection efficiency provided for areas with active gas collection. Our TROPOMI-informed mean collection efficiency is 0.50 (0.33 – 0.54).

We find a record of construction events, leaks, and landfill standard violations at the landfills with the largest discrepancies between TROPOMI-informed and reported emissions. Two of the top three methane-emitting landfills per our accounting constructed large GCCS facilities in 2019. The South Shelby Landfill in Tennessee constructed a pipeline injection facility that now produces the equivalent of more than 33,000 gallons of gasoline per day, and the South Side Landfill in Indianapolis built a facility that can now generate 8 million gallons of landfill gas per year. The TROPOMI-informed emissions at these landfills are about an order of magnitude larger than reported. We also find that many of the largest emitting landfills have a history of gas leaks and landfill standard violations, consistent with EPA's proposed revisions.

TROPOMI can also identify and quantify large emission events on sub-annual scales. Schuit et al. (2023) developed a machine learning approach to identify plumes in TROPOMI data, which are manually verified on a weekly basis by an expert team at SRON. This system found 312 plumes in the U.S. in 2021, with ~20% provisionally attributed to landfills based on the most prominent sector in the global gridded bottom-up inventories for oil, gas, coal, and landfills used for source assignment. These identifications can be used to direct high-resolution satellite or aircraft instruments, which can be used to improve source attribution (for example, to specific pieces of infrastructure) and emission rate quantification. Schuit et al. (2023) applied this method to landfills in Casablanca, Morocco and Madrid, Spain using observations from TROPOMI and the high-resolution GHGSat satellite instrument. Maasakkers et al. (2022) used a similar approach to observe four landfills around the world. In in all cases that clear-sky GHGSat-C1/2 observations were available, the data confirmed large landfill emissions. Multi-satellite emission quantification has also been applied to oil and gas emissions in the United States (Cusworth et al., 2021). GHGSat source rate estimation has been validated by single-blind release studies (Sherwin et al., 2023). The AVIRIS-NG instrument, which could be used in a similar tip-and-cue framework, has also been validated by single-blind release studies and by comparison to independent aircraft data (El Abbadi et al., 2023).

This work demonstrates that satellite data can be used to monitor annual mean emissions, establish baseline collection efficiencies, and identify high-emission events, particularly when paired with validation by aircraft and high-resolution satellite or aircraft observations.

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Schuit, B.J., J.D. Maasakkers, P. Bijl, G. Mahapatra, A.-W. Van den Berg, S. Pandey, A. Lorente, T. Borsdorff, S. Houweling, D.J. Varon, J. McKeever, D. Jervis, M. Girard, I. Irakulis-Loitxate, J. Gorroño, L. Guanter, D.H. Cusworth, and I. Aben: Automated detection and monitoring of methane super-emitters using satellite data, *Atmos. Chem. Phys. Discuss.* [preprint], https://doi.org/10.5194/acp-2022-862, in review, (2023).

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Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 19

Comment Excerpt: A recent study under review in Atmospheric Chemistry and Physics uses observations from the TROPOMI satellite instrument to quantify methane emissions from 70 landfills reporting to GHGRP across the contiguous United States. The study is limited to

landfills that report more than 2.5 gigagrams per year (Gg/a), that are the dominant source within a given region where emissions were quantified, and that can be quantified by the satellite. This is the first comprehensive study based on satellite measurement of annual-average landfill emissions across the U.S. The estimates account for background landfill emissions (not just plumes) and for variability in emissions over the course of the year, neither of which are captured by typical aircraft studies. The results are also compared to aircraft studies conducted over 9 of the 70 landfills and find good agreement for landfills without significant operational changes or leak differences between the periods of study. While there are uncertainties around the emissions estimates for individual landfills, this work demonstrates that satellite data can be used to monitor annual mean emissions, establish baseline collection efficiencies, and identify high-emission events, particularly when paired with validation by aircraft and high-resolution satellite observations.

The study finds 51% higher landfill emissions compared to the 2023 EPA GHGI, which is based on GHGRP reporting, scaled up to account for non-reporting landfills. At the 70 landfills that are compared to the GHGRP, the authors find a median 77% increase in reported emissions (from a GHGRP mean of 7.2 Gg/a to an estimate of 13 Gg/a). At the 38 facilities that recover gas, the authors find a mean recovery efficiency of 0.50 (0.33 – 0.54) that is much smaller than the GHGRP mean of 0.61 and the default assumption of 0.75. The study finds no (zero) correlation between GHGRP reporting and the study's estimated emissions. This finding applies to GCCS and non-GCCS facilities alike. This implies that the current GHGRP methods have little predictive power. The authors attribute the discrepancy to two main factors: 1) over-estimated recovery efficiencies at GCCS facilities and 2) under-accounting of site-specific factors (such as noncompliance issues and construction). The largest emitting landfills, which are also the landfills with the largest discrepancies with GHGRP, are associated with construction projects and a history of leaks and other landfill standard violations, which may be the driver of the discrepancy. This unique work, which will likely be reproduced for future years, provides information about annual emissions that can be used by EPA for understanding discrepancies in emission estimates, identifying problem landfills, and improving the accuracy of reported emissions. It is also a useful complement to point source aerial data, which can be used for additional purposes within the reporting program. Below, we provide recommendations for integrating both types of aerial emissions data, annual averages and point source detections, into subpart HH.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A2
Comment Excerpt Number: 1

Comment Excerpt: [The commenter submitted a copy of the article "High-resolution U.S. methane emissions inferred from an inversion of 2019 TROPOMI satellite data: contributions from individual states, urban areas, and landfills," Nesser et al., for consideration.]

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Hannah Nesser
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0306-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA should also allow the use of credible satellite- and aircraft-derived annual emission estimates to identify potential biases in reported emissions. Credibility in the observation-informed estimate should follow the criteria described for point source detection (Section III(c)(i)). EPA should develop a process to analyze cases where large discrepancies exist between reported and observation-informed emissions. In the cases where additional analysis confirms the observation-informed estimate, EPA should require the revision of the GHGRP emission. This process would both improve short-term emission estimates and emission estimate methodologies in the future.

Our work demonstrates the potential value of such a process. Of the 70 landfills studied, we find TROPOMI-informed emissions that differ by 50% or more from GHGRP reports at 33 facilities. Most of these (28, or 85%) report much lower emissions. Many of these landfills are also large emitters: seven of our top ten methane-producing landfills are also among the ten facilities with the largest discrepancies between our estimates and GHGRP values. These landfills include the South Shelby, South Side, and City of Dothan Sanitary Landfills, all of which experienced site-specific events in 2019 that could be incorporated into GHGRP estimates under the recommended process.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Hannah Nesser
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0306-A1
Comment Excerpt Number: 6

Comment Excerpt: My work demonstrates that satellite observations can be combined with reported recovered methane to calculate data-informed collection efficiencies. EPA should allow the use of aggregate observations from aircraft or high-resolution satellites to establish and quantify GHGRP parameters. These platforms can provide large quantities of data across many landfills, allowing improved identification and quantification of the parameters driving methane emissions. These observations could improve parameter estimates in current GHGRP reporting guidance following the example set by the use of Rutherford et al. (2021) in Subpart W. These data could also identify additional parameters controlling methane emissions and inform the development of improved GHGRP methods. For example, these data could provide information on emissions from specific pieces of infrastructure or better inform the temporal variability of oxidation rates. To support observation-informed parameter estimates, EPA should also require the reporting of additional data from landfills, including GCCS type and design, destruction device type and characteristics, monitoring technologies, site cover type and extent, and site-specific information such as leaks or construction events. Reporting methods should also be applied consistently in time so that that GHGRP time series reflect only operational effects and not changes in the reporting method chosen by landfill operators.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Carbon Mapper
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0324-A1
Comment Excerpt Number: 7

Comment Excerpt: Annual emissions estimates based on advanced monitoring approaches can be used as a critical check on reported emissions that are based on modeling. Scientific studies have flagged disagreements between landfill gas models or inventories and observed emission rates using remote sensing (*e.g.*, Nesser et al., 2023; Krautwurst et al., 2017; Duren et al., 2019), but there is no existing system to validate or revise GHGRP reporting based on these observations.

A favorable observing approach for validation of reported annual emissions would be an observing system that can quantify total site-wide emission sources and includes high-frequency to continuous monitoring to account for temporal variability. This would likely require a tiered approach that incorporates multiple monitoring technologies to capture point and area source emissions. Within this tiered approach, there can be varied monitoring frequencies for each technology that when combined can capture the variability of landfill emissions over time and the variability of source types across the face of the landfill. For example, a tiered approach may combine a ground monitoring system with continuous monitoring of total site emissions with periodic observations by a remote sensing instrument that can map any point sources that may be missed or underestimated by a ground-based system (due to variability of wind direction for example).

EPA should (a) lead the development of standards for the construction of a comprehensive tiered monitoring approach best suited to landfill monitoring and optimized for detection completeness (defined as the % of a population of emissions that can be detected by a monitoring system as a function of detection limit, spatial coverage, and sample frequency) and (b) develop a systematic approach for the comparison of subpart HH reported emissions with quantified emissions based on tiered monitoring or other approved approaches.

As in the large release category described above, for each year of reporting, EPA should analyze discrepancies between quantified annual emissions from tiered observations with existing reporting methods and revise operator-reported emissions as necessary. EPA can also use this information to improve model assumptions, such as collection efficiency, over time. As more information is gathered on ideal monitoring strategies and comparison to GHGRP reporting, EPA should consider developing criteria/methods for allowing operators to demonstrate equivalency with existing GHGRP reporting using advanced monitoring technology if EPA finds that these methods are accurately capturing emissions.

References

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Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 10

Comment Excerpt: Annual emissions estimates based on advanced monitoring approaches can be used as a critical check on reported emissions that are based on modeling. Scientific studies have identified disagreements between landfill gas models or inventories and observed emission rates using remote sensing (*e.g.*, Krautwurst et al., 2017; Duren et al., 2019), but there is no existing system to validate or revise GHGRP reporting based on these observations.

As in the large release category described above, during the annual GHGRP verification process, EPA should analyze discrepancies between credible annual emissions estimates based on observational data (such as Nesser et al.) and existing subpart HH reporting methods, and revise

operator-reported emissions as necessary. Large discrepancies in annual emissions reported to EPA and those quantified based on observational data may alert EPA to issues at specific landfills or misreporting. This information would allow EPA to take appropriate follow up action, such as seeking additional information from the landfill operator about specific events that may be driving the discrepancy (*e.g.*, construction or noncompliance). To operationalize this, we recommend that EPA create a mechanism under subpart HH for receiving and considering third-party observational data that EPA could then use to revise reported emissions as necessary (*e.g.*, updating f_{Rec} or f_{Dest} values to account for periods of downtime or poor performance not captured that contributed to a large discrepancy).

A valuable observing approach for verification of reported annual emissions would be an observing system that can quantify total site-wide emission sources and includes high-frequency to continuous monitoring to account for temporal variability. This would likely require a tiered approach that incorporates multiple monitoring technologies to capture point and area source emissions. Within this tiered approach, there can be varied monitoring frequencies for each technology that when combined can capture the variability of landfill emissions over time and the variability of source types across the face of the landfill. For example, a tiered approach may combine a ground monitoring system with continuous monitoring of total site emissions with periodic observations by a remote sensing instrument that can map any point sources that may be missed or underestimated by a ground-based system (due to variability of wind direction for example).

We recommend EPA lead the development of standards for the construction of a comprehensive tiered monitoring approach best suited to landfill monitoring and optimized for detection completeness (defined as the % of a population of emissions that can be detected by a monitoring system as a function of detection limit, spatial coverage, and sample frequency). This approach can be leveraged to verify annual reported emissions and revise subpart HH reports in cases of discrepancy (as recommended above), and also be used to improve the formulas' underlying assumptions, such as collection efficiency, over time.

EPA should consider, in the future, developing criteria and methods for allowing operators to demonstrate equivalency with existing GHGRP reporting using advanced monitoring technology if EPA finds that these methods are accurately capturing emissions.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Michael E. Van Brunt
Commenter Affiliation: Covanta Energy, LLC
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0308-A1
Comment Excerpt Number: 5

Comment Excerpt: The EPA has proposed new guidelines to expand the number of landfills that can report emissions by monitoring surface concentrations of methane utilizing portable

monitors. To ensure these measurements best represent actual emissions, we encourage the EPA to explore alternative technologies less susceptible to spatial and temporal variability. Data from portable surface monitors is greatly affected by the specific device utilized, the soil characteristics and vegetation of the landfill as well as atmospheric conditions, resulting in data variability depending on the measuring time and location.[21] Mønster et al. 2019 explain that these portable devices may be helpful in landfill maintenance, for example locating landfill hotspots or checking the integrity of cover materials, but recommends they be used in combination with another quantitative technique which is representative of the entire landfill's plume for reporting purposes such as radial plume mapping, gas dispersion, or aerial inverse modeling.[22]

The literature referenced by the EPA in relation to surface monitoring is only one part of the larger body of research which demonstrates the strengths of alternative direct measurement techniques. The Duren et al. article cited in the proposal utilizes aerial methods to conclude that California landfill methane emissions may be considerably higher than those quantified under subpart HH. Similarly, several other studies agree that landfill operators derive the most representative measurements downwind of a landfill using aerial or ground plume techniques, which have the capacity to measure an entire landfill's methane plume.[23, 24, 25, 26]

Footnotes

[21] Mønster, J., Kjeldsen, P., Scheutz, C., 2019. Methodologies for measuring fugitive methane emissions from landfills – A review. Waste Management 87, 835-859. https://doi.org/10.1016/j.wasman.2018.12.047.

[22] Ibid.

[23] Scharff, H., Jacobs, J., Oonk, H., Hensen, A., n.d., 2005. Methods to ascertain methane emission of landfills. NV Afvalzorg Holding. URL: https://www.afvalzorg.nl/content/uploads/2017/09/Paper-methods-to-ascertain-methane-emission.pdf.

[24] Mønster, J., Kjeldsen, P., Scheutz, C., 2019. Methodologies for measuring fugitive methane emissions from landfills – A review. Waste Management 87, 835-859. https://doi.org/10.1016/j.wasman.2018.12.047.

[25] Allen, G., Hollingsworth, P., Kabbabe, K., Pitt, J.R., Mead, M.I., Illingworth, S., Roberts, G., Bourn, M., Shallcross, D.E., Percival, C.J., 2019. The development and trial of an unmanned aerial system for the measurement of methane flux from landfill and greenhouse gas emission hotspots. Waste Manage. 87, 883–892. URL: https://www.sciencedirect.com/science/article/pii/S0956053X17309698nt and trial of an unmanned aerial system for the measurement of methane flux from landfill and greenhouse gas emission hotspots - ScienceDirect

[26] Hanson, J., et al. (2020), Estimation and Comparison of Methane, Nitrous Oxide, and Trace Volatile Organic Compound Emissions and Gas Collection System Efficiencies in California Landfills, The California Air Resources Board (CARB). https://ww2.arb.ca.gov/sites/default/files/2020-12/CalPoly_LFG_Study_03-30-20.pdf

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Carbon Mapper
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0324-A1
Comment Excerpt Number: 1

Comment Excerpt: Top-down measurement approaches use information from satellite, aerial, near-ground or ground-based instruments to detect and/or quantify landfill methane emissions. For example, plume-mapping remote sensing instruments – such as aircraft or satellite imaging spectrometers – provide a map of methane plumes in units of concentration over a desired area. Various methods exist to translate the methane concentration for an identified methane plume to a source-specific emission rate. Most commonly used is the Integrated Mass Enhancement (IME; Thompson et al., 2016; Frankenburg et al., 2016) method, which can provide a source-specific emission rate with an uncertainty estimate and has been applied to methane plumes at landfills (Maasakkers et al., 2022; Duren et al., 2019; Cusworth et al., 2023). The IME method has been evaluated through controlled release experiments and comparison to independent measurements (*e.g.*, Thorpe et al., 2021). Other quantification approaches combine methane concentration measured by drones, ground vehicles, or aircraft (upwind and downwind of the landfill or in a circular flight path around the landfill) with wind speed and direction data to calculate a site-wide emission rate through a mass balance approach or atmospheric inverse modeling (*e.g.*, Gaussian plume model; Olaguer et al., 2022; Shaw et al., 2021; ECCC, 2023). Continuous emissions monitoring systems, which often utilize metal oxide sensors or laser dispersion spectrometry with reflectors to make methane measurements, can also be used to quantify total site-wide emissions when combined with wind data (assuming sufficient sensor coverage; ECCC 2023).

Key factors to consider when using top-down measurement approaches to enhance annual inventories include:

- Detection Limit & Coverage: Landfills emit methane diffusely through the landfill surface (area source emissions) and in more concentrated hot spots (point source emissions). Some measurement approaches with maximum sensitivity (*e.g.*, in-situ sensors on low altitude aircraft capable of mass balance measurements) can provide emissions estimates for total area sources, while plume-mapping instruments with higher detection limits (*e.g.*, imaging spectrometers on satellites or higher altitude aircraft) can estimate emission rates for point sources across the face of a landfill but cannot quantify emission diffuse area source emissions. Point sources can dominate emissions at some landfills (Duren et al., 2019; Cusworth et al., 2023), but a multi-tiered monitoring strategy that includes multiple technologies is needed to assess total site-wide emissions.
- Measurement Frequency & Temporal Variability: With the exception of continuous monitoring sensors (which may provide incomplete coverage), many advanced measurement systems provide a snapshot estimate of landfill methane emissions at a given point in time. Emissions from landfills, while persistent, can fluctuate widely over time due to changes in environmental and operational conditions. Continuous monitoring systems with sufficient spatial coverage can capture these temporal

trends, but for other methods, repeated surveys (*e.g.*, daily to monthly revisits) and/or other data inputs that account for environmental factors are important to improve accuracy and completeness when extrapolating annual emissions rates.

References

Cusworth, D.H., et al., Quantifying methane emissions from US landfills, Science, in review (2023).

Duren, R. M. et al. California's methane super-emitters. Nature. 575(7781), pp.180-184 (2019).

Frankenberg, C. et al. Airborne methane remote measurements reveal heavy-tail flux distribution in Four Corners region. Proc. Natl. Acad. Sci. U.S.A. 113, 9734–9739 (2016).

Maasakkers, J. D. et al., Using satellites to uncover large methane emissions from landfills. Sci. Adv. 8, eabn9683 (2022).

Thompson, D. R. et al. Space-based remote imaging spectroscopy of the Aliso Canyon CH_4 superemitter. Geophys. Res. Lett. 43, 6571–6578 (2016).

Thorpe, A. K. et al. Improved methane emission estimates using AVIRIS-NG and an Airborne Doppler Wind Lidar. Remote Sensing of Environment. 266, p.112681 (2021).

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 4

Comment Excerpt: Top-down measurement approaches use information from satellite, aerial, near-ground or ground-based instruments to detect and/or quantify landfill methane emissions. For example, plume-mapping remote sensing instruments – such as aircraft or satellite imaging spectrometers – provide a map of methane plumes in units of concentration over a desired area. Various methods exist to translate the methane concentration for an identified methane plume to a source-specific emission rate. Most commonly used is the Integrated Mass Enhancement (IME; Thompson et al., 2016; Frankenburg et al., 2016) method, which can provide a source-specific emission rate with an uncertainty estimate and has been applied to methane plumes at landfills (Maasakkers et al., 2022; Duren et al., 2019; Cusworth et al., 2023, in review). The IME method has been evaluated through controlled release experiments and comparison to independent measurements (*e.g.*, Thorpe et al., 2021). Other quantification approaches combine methane concentration measured by drones, ground vehicles, or aircraft (upwind and downwind of the landfill or in a circular flight path around the landfill) with wind speed and direction data to

calculate a site-wide emission rate through a mass balance approach or atmospheric inverse modeling (*e.g.*, Gaussian plume model; Olaguer et al., 2022; ECCC, 2023). Continuous emissions monitoring systems, which often utilize metal oxide sensors or laser dispersion spectrometry with reflectors to make methane measurements, can also be used to quantify total site-wide emissions when combined with wind data (assuming sufficient sensor coverage; ECCC 2023).

Key factors to consider when using top-down measurement approaches to enhance annual inventories include:

- Detection Limit & Coverage: Landfills emit methane diffusely through the landfill surface (area source emissions) and in more concentrated hot spots (point source emissions). Some measurement approaches with maximum sensitivity/lower detection limits (*e.g.*, in-situ sensors on low altitude aircraft capable of mass balance measurement) can provide emissions estimates for total area sources, while plume-mapping instruments with higher detection limits (*e.g.*, imaging spectrometers on satellites or higher altitude aircraft) can estimate emission rates for point sources across the face of a landfill but cannot quantify diffuse area source emissions. Point sources can dominate emissions at some landfills (Duren et al., 2019; Cusworth et al., 2023), but a multi-tiered monitoring strategy that includes multiple technologies is needed to accurately assess total site-wide emissions.
- Measurement Frequency & Temporal Variability: With the exception of continuous monitoring sensors (which may provide incomplete coverage), many advanced monitoring systems provide a snapshot estimate of landfill methane emissions at a given point in time. Emissions from landfills, while persistent, can fluctuate widely over time due to changes in environmental and operational conditions. Continuous monitoring systems with sufficient spatial coverage can capture these temporal trends, but for other methods, repeated surveys (*e.g.*, daily to monthly revisits) and/or other data inputs that account for environmental factors are important to improve accuracy and completeness when extrapolating annual emissions rates.

References

Cusworth, D.H., et al., Quantifying methane emissions from US landfills, Science, in review (2023).

Duren, R. M. et al. California's methane super-emitters. Nature. 575(7781), pp.180-184 (2019).

Frankenberg, C. et al. Airborne methane remote measurements reveal heavy-tail flux distribution in Four Corners region. Proc. Natl. Acad. Sci. U.S.A. 113, 9734–9739 (2016).

Maasakkers, J. D. et al., Using satellites to uncover large methane emissions from landfills. Sci. Adv. 8, eabn9683 (2022).

Thompson, D. R. et al. Space-based remote imaging spectroscopy of the Aliso Canyon CH_4 superemitter. Geophys. Res. Lett. 43, 6571–6578 (2016).

Thorpe, A. K. et al. Improved methane emission estimates using AVIRIS-NG and an Airborne Doppler Wind Lidar. Remote Sensing of Environment. 266, p.112681 (2021).

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Carolyn Alden
Commenter Affiliation: LongPath Technologies, Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0292-A1
Comment Excerpt Number: 1

Comment Excerpt: Calculation-based methods are typically limited in their ability to fully address emissions sources that come from complex or dynamic activities. The sooner the EPA can move toward "top-down" or facility-wide measurement of emissions for reporting or validation of reported values, the sooner reported and measured emissions will be reconcilable and verifiable.

We urge the EPA to adopt and encourage direct measurement of methane emissions in all circumstances. We encourage EPA to support techniques that can clearly demonstrate: 1) verified accuracy of emission source quantification, 2) defensible detection limits, where not only large but also small emission rates can be accurately quantified, 3) coverage of all emission sources on the reporting facility, 4) and a high time-frequency of observing all potential emission sources, given the variability and distributions of high emitters.

We strongly recommend that open-path (line sensor) continuous monitoring be encouraged as a means to validate, verify and directly measure emissions estimates from traditional (inventory-based) means.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Carbon Mapper
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0324-A1
Comment Excerpt Number: 3

Comment Excerpt: While incorporating regulatory surface emissions monitoring (SEM) data into Subpart HH modeling will help account for emissions from cover leaks, current SEM practices fail to fully capture fugitive methane emissions across the landfill surface, due to limitations in walking patterns, exempt areas (*e.g.*, steep slopes, construction areas, and the active working face), and operator error or malpractice. Top-down remote sensing approaches, including monitoring instruments mounted on drones, airplanes, and satellites, can provide a

more comprehensive view of landfill emissions. The benefit of these technologies compared to SEM is that they can (1) detect sources from anywhere across the face of the landfill, (2) access dangerous areas, and (3) observe the full extent of a detected methane plume and use existing methods to generate an emission rate, allowing for direct incorporation into emissions reporting. Repeat site visits ensure accurate characterization of emission sources, and through a satellite constellation, repeat site visits are possible over a prolonged period of time without additional heavy lifting or manual site revisits. New satellite systems are planned for launch in 2024 and subsequent years which should dramatically improve coverage and data availability for landfill methane emissions (Jacob et al., 2022).

References

Jacob, D. J., et al. Quantifying methane emissions from the global scale down to point sources using satellite observations of atmospheric methane. Atmos. Chem. Phys. 22, 9617-9646 (2022).

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 5

Comment Excerpt: While incorporating data from surface emissions monitoring (SEM) into subpart HH will help account for emissions from cover leaks, current SEM practices fail to fully capture methane emissions across the landfill surface, due to limitations in walking patterns, exempt areas (*e.g.*, steep slopes, construction areas, and the active working face), and operator error or malpractice. Top-down remote sensing approaches, including monitoring instruments mounted on drones, airplanes, and satellites, can provide a more comprehensive view of landfill emissions. The benefit of these technologies compared to SEM is that they can (1) detect sources from anywhere across the face of the landfill, (2) access dangerous areas, and (3) observe the full extent of a detected methane plume and use existing methods to generate an emission rate, allowing for direct incorporation into emissions reporting. Repeat site visits ensure accurate characterization of emission sources, and through a satellite constellation, repeat site visits are possible over a prolonged period of time without additional heavy lifting or manual site revisits. New satellite systems are planned for coming years, which will improve coverage and data availability for landfill methane emissions (Jacob et al., 2022).

References

Jacob, D. J., et al. Quantifying methane emissions from the global scale down to point sources using satellite observations of atmospheric methane. Atmos. Chem. Phys. 22, 9617-9646 (2022).

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Carbon Mapper
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0324-A1
Comment Excerpt Number: 4

Comment Excerpt: Plume-mapping remote sensing technologies on satellites such as the Carbon Mapper Coalition constellation and NASA's EMIT investigation or aircraft like the Next Generation Airborne Visible/Infrared Imaging Spectrometer (AVIRIS-NG) can provide a site-wide view of any potential high-emitting point sources across the face of the landfill at high spatial resolution, allowing attribution of observed methane plumes to sources on the landfill (Cusworth et al., 2020). Plume-mapping instruments have been used to detect and quantify emissions from regions routinely left out of the SEM including the active working face, steep slopes, and construction areas (Maasakkers et al., 2022; Cusworth et al. 2020; Cusworth et al., 2023).

References

Cusworth, D. H. et al. Using remote sensing to detect, validate, and quantify methane emissions from California solid waste operations. Environ. Res. Lett. 15, 054012 (2020).

Cusworth, D.H., et al., Quantifying methane emissions from US landfills, Science, in review (2023).

Maasakkers, J. D. et al., Using satellites to uncover large methane emissions from landfills. Sci. Adv. 8, eabn9683 (2022).

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization

Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 6

Comment Excerpt: Plume-mapping remote sensing technologies on satellites or aircraft like the Next Generation Airborne Visible/Infrared Imaging Spectrometer (AVIRIS-NG) can provide a site-wide view of any potential high-emitting point sources across the face of the landfill at high spatial resolution, allowing attribution of observed methane plumes to sources on the landfill (Cusworth et al., 2020). Plume-mapping instruments have been used to detect and quantify emissions from regions routinely left out of the SEM including the active working face, steep slopes, and construction areas (Maasakkers et al., 2022; Cusworth et al. 2020; Cusworth et al., 2023).

References

Cusworth, D. H. et al. Using remote sensing to detect, validate, and quantify methane emissions from California solid waste operations. Environ. Res. Lett. 15, 054012 (2020).

Cusworth, D.H., et al., Quantifying methane emissions from US landfills, Science, in review (2023).

Maasakkers, J. D. et al., Using satellites to uncover large methane emissions from landfills. Sci. Adv. 8, eabn9683 (2022).

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Carbon Mapper
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0324-A1
Comment Excerpt Number: 9

Comment Excerpt: We also recommend EPA facilitate the quick flow of information from credible third parties to operators, to enable fast investigation and mitigation of detected methane plumes. We encourage EPA to partner with other agencies (*e.g.*, NASA, NOAA, NIST, DOE) and leverage relationships with operators developed through the Landfill Methane Outreach Program (LMOP) in the development of these standards, information tools, and review processes.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 15

Comment Excerpt: We also recommend EPA facilitate the quick flow of information from credible third parties to operators, to enable fast investigation and mitigation of detected methane plumes. We encourage EPA to partner with other agencies (*e.g.*, NASA, NOAA, NIST, DOE) and leverage relationships with operators developed through the Landfill Methane Outreach Program (LMOP) in the development of these standards, information tools, and review processes.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Patrick Serfass
Commenter Affiliation: American Biogas Council (ABC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0313-A1
Comment Excerpt Number: 4

Comment Excerpt: Most companies operating municipal solid waste landfills recognize that taking steps to curb methane emissions from their facilities is critical. In the proposed rule, the EPA proposes revisions to landfill requirements based on studies suggesting that current methodologies and models underestimate methane emissions from landfills. This is something that industry has noted as well. While this may call into question the effectiveness of current methane capture and flaring practices, it also presents an opportunity to improve the LCA and overall emission accounting at landfills, and for landfills to adopt practices that capture methane emissions more effectively.

Response: The EPA acknowledges the comment and support of the proposed revisions to subpart HH.

19.5 Revisions to DOC and k values

Commenter Name: Prof. Nickolas J. Themelis
Commenter Affiliation: Earth Engineering Center, Columbia University
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0228-A1
Comment Excerpt Number: 1

Comment Excerpt: We have studied extensively methane generation in landfills and we are in agreement with increasing the first order decay rate (k) for biodegradation.

Response: The EPA acknowledges the commenter's support of the proposed revisions to k-values for subpart HH.

Commenter Name: Darrell K. Smith and David Biderman
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0237-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA proposes to revise the default k values under Subpart HH in response to public comments received for previous Inventory reports. The RTI International (RTI) memorandum dated June 11, 2019 presents the derivation of the proposed new k values for Bulk MSW and Modified Bulk MSW. The memorandum states that EPA is considering changes to the existing k values due to public comments about U.S. k values being lower than k values used in other Annex I countries in similar climates. Given that with few exceptions, the k values reported by other countries relied almost exclusively on the IPCC model, comparisons should not include those countries. The assumption that the 2006 IPCC model provides more realistic estimates of landfill (LFG) generation from U.S. landfills is not justified for a number of reasons:

1. The IPCC model has been available since 2006, so the fact that IPCC has higher k values is not new information which justifies a review.

2. IPCC is an international model not designed for U.S. waste composition and site conditions, but for a range of very different countries, including less developed nations that produce a much higher percentage of food waste than the U.S., and therefore should have much higher bulk waste k values.

3. Material-specific k values listed in IPCC are highly uncertain and have inconsistent ratios between material types when the ratios are compared across different climate zones.

4. IPCC reports higher k values for "tropical" climates than for temperate climates in the same moisture category (wet or dry). The tropical climate zone is not applicable for the vast majority of U.S. sites, but more importantly, it is inappropriate for sanitary landfills that produce their own heat and are largely independent of ambient temperature to have k values that are higher in hotter climates. If anything, higher ambient temperatures may produce lower k values at a given precipitation level due to higher evaporation rates that dry out the waste. IPCC's higher k values for warmer climates conflicts with their own assertion that evaporation should be considered when evaluating moisture levels in landfills.

RTI suggests that the European Union's more aggressive goals of waste diversion "may be a driver as to why, when compared to the U.S., the k values applied by these countries are higher." We suggest that the EPA assign regulatory k values that reflect data that the industry has been collecting for decades rather than basing it on a motivation to promote waste diversion. We also note that EPA's proposed k values are actually significantly higher than IPCC's k values.

In both the June 11 and June 18 memoranda, RTI suggested that its research provided the basis for the existing k values (0.02, 0.038, and 0.057), and cites only RTI 2003 and 2004 studies as references. However, RTI did not develop these k values. They were developed by SCS Engineers under contract to EPA for their Landfill Methane Outreach Program (LMOP). In 2004, EPA's LMOP requested SCS to provide a set of k values for U.S. landfills in different climate zones that reflected the average of values being applied by SCS in LFG models they had been preparing over several years to assist LMOP with their LFG-to-energy outreach work.

SCS modeled landfill gas generation using field data from sites with gas collection and control systems (GCCS). The modeled numbers were empirically calibrated using historical LFG flow data and an independent estimate of collection efficiency. The average of k values derived from the calibrated models were then used to assign the "default" k values provided to LMOP. This was later replicated in Table HH–1 of the GHG Reporting Rule. The existing k values have now been used for 12 years of GHG emissions reporting and has consistently resulted in reasonable estimates for U.S. landfills.

We strongly disagree that we need to turn to other countries for guidance. Because of its greater reliance on landfills than European countries, the U.S. has the most advanced LFG collection and control infrastructure in the world and the most robust LFG-to-energy industry, which has led to the U.S. developing expertise in LFG modeling that is unmatched in other countries.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 26

Comment Excerpt: EPA's revised approach to default k values will result in an increase in reported emissions from active landfills and reduced emissions from closed and inactive landfills. According to EPA the changes are more in line with Intergovernmental Panel on Climate Change defaults and k values used in countries with similar climates. CATF suggests that EPA consider how the proposed k value changes may impose unintended negative consequences on the collective accuracy of landfill reporting and methane mitigation within the U.S. Specifically, use of the newly proposed k values may lead closed and inactive landfills to cease gas capture operations sooner per New Source Performance Standard requirements.[93] Again, considering uncertainties in the use of FOD models, and the lack of U.S. site-specific data

used to estimate these new values, this may have consequences counter to U.S. methane mitigation goals.

Footnotes

[93] Pradeep Jain et al., Greenhouse Gas Reporting Data Improves Understanding of Regional Climate Impact on Landfill Methane Production and Collection, 16 PLoS ONE (2021), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7909644/.

Response: The NSPS regulations have their own specifications for determining when gas collection may cease operation, which are independent of the default values used in subpart HH. Therefore, we disagree with the commenter that use of the newly proposed k values may lead closed and inactive landfills to cease gas capture operations sooner per New Source Performance Standard requirements.

Commenter Name: Darrell K. Smith and David Biderman
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0237-A1
Comment Excerpt Number: 6

Comment Excerpt: Optimizing k and DOC values simultaneously can lead to extreme and unrealistic values because an error in one value causes an offsetting error in the other to yield the same LFG generation estimate. The extremely wide observed range of "optimized" k values (*e.g.*, 0.001 to 0.400 for dry climates) produce so much uncertainty in the estimated average value as to render it practically meaningless.

The analysis allowed both k and DOC to vary across extreme and unrealistic ranges producing unrealistic results. Because the k and DOC values were not constrained to realistic values, the results ranged widely. The range of k values observed in the RTI study (*e.g.*, 0.001 to 0.400 for dry sites) demonstrates that this method produces extreme values and is unreliable. The average of k values that vary across a 400-fold range is not a statistically meaningful number and cannot be the basis for regulating U.S. landfills.

We do not share EPA's faith in RTI's method of using multivariate analysis to solve for k. A much more reliable method for solving for k would be to do so on a site-by-site basis, by first assigning realistic Lo values reflecting waste composition, and using independent collection efficiency estimates that reflect more site-specific information than the simplistic method used in HH-7 similar to how SCS Engineers developed the k values for LMOP in 2004 that were later adopted by the EPA.

EPA's proposed new k values were never demonstrated by RTI to produce realistic LFG generation estimates for individual sites. On the other hand, thousands of U.S. landfills have been reporting GHG emissions for the past 12 years using the existing k values, while the only

criticism offered by the EPA to justify changes are public comments that the U.S. had lower k values than the IPCC and other countries.

Further, EPA's multivariate analysis utilized an eligibility criteria that eliminated any facilities that did not report for all years 2011-2017. Landfill gas emissions are most variable at the beginning and end of operations when reporting is just beginning or ending. These landfills are more likely to have been eliminated by the eligibility criteria that was utilized. Therefore, the results may not be a true reflection of what occurs at landfills. Only 27% of landfills reporting to the GHGRP met the eligibility criteria.

EPA took this smaller cohort of landfills and further reduced it by removing outliers that were outside the acceptable range, removing another 56 landfills which accounted for over 25% of the moderate precipitation facilities. Even with the reduced number of landfills, the observed range for the optimized decay value varied by over two orders of magnitude.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Darrell K. Smith and David Biderman
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0237-A1
Comment Excerpt Number: 7

Comment Excerpt: The changes to estimated LFG generation from proposed new k and DOC values listed in Table 6 of the June 11, 2019 RTI memo are extremely large, particularly for open dry sites. These large increases in emissions estimates for open sites imply that prior estimates were underreporting emissions to such a large extent that the underestimates should be easily demonstrated. However, EPA has not presented evidence that LFG generation has been underestimated at any specific sites, much less across the country at many sites so as to indicate a consistent pattern of underestimation.

Combined with the minor changes to DOC, the proposed new k values produce estimates of LFG generation that are up to 130% higher than before. The large increases in calculated LFG generation listed in Table 6 of the June 11, 2019 RTI memo are unacceptable considering the lack of evidence of problems with historical estimates and the lack of prior indication that such impactful changes to the methodology would be forthcoming. Note that the lower percent changes in the estimates listed in Table 7 are blended values with offsetting changes that are less representative of the impacts that individual landfills will experience when reporting GHG emissions using the new values in HH-1 and HH-6.

We are especially concerned with the effects these changes will have on arid climate landfills. Using the proposed k and DOC values for arid climate site will substantially increase the methane emission estimates under Equation HH–6 and create a huge discrepancy between HH-6

and HH-8. Based on our review of the proposed values for a series of arid climate landfills, the resulting methane emissions under HH-6 would be well outside of the range of likelihood for these landfills, especially when landfill gas recovery rates and surface emissions monitoring data are reviewed. The difference between HH-6 and HH-8 values will increase for most landfills using the proposed k and DOC value, more pronounced for the arid and moderate precipitation sites, and we are very concerned how that will be used in future regulatory or policy decisions regarding landfills as well as how landfill opponents will try capitalize (sic) on the discrepancy.

Last, while EPA cites that the k values can be a factor of 2 or 3 from the average recommended by IPCC as part of the reason for reconsidering k values, the observed range in EPA's report varied by a factor of 400. This suggests that these revised numbers are not supported by this analysis.

EPA suggests that "[t]he nationwide impact of these changes will likely be limited...because...[a]bout 71 percent of subpart HH facilities in RY2020 used equation HH–8 to estimate their methane emissions and the proposed revisions would not impact the emissions reported for these facilities. Thus, the proposed revisions would impact only the emissions from landfills without GCS and landfills with GCS that elect to report emissions using equation HH–6, which is a smaller fraction (about 35 to 40 percent) of the total methane emissions reported subpart HH." While the total impact on the reported greenhouse gas emissions may not be significant, this change could result in significant changes to individual landfills. Therefore, we believe it is important to utilize a method that is supported by data and science.

Further, EPA appears to have relied solely on the report by RTI to propose the revised k-values disregarding more recent analysis developed by EPA itself. In 2021, EPA's Office of Research and Development published an article in PLOS ONE[3] suggesting ranges for k values for each precipitation class that fall below the proposed changes. Like the RTI study, this study utilized data from the GHGRP but used a different methodology. This study focused on closed landfills, by assuming that collection approximated generation. However, even this methodology has flaws. The assumption that k values are static over the life of the landfill ignores the potential for reduced values that would likely occur when a landfill is capped and drying out. Further, if emissions were in fact generated from those closed sites, this would equate to higher generation rates. Higher generation rates for closed landfills suggests that the k values should be even lower than this study proposes.

Given all the problems outlined in the forgoing, the proposed changes to k values cannot be supported by EPA's analysis. Therefore, we strongly encourage EPA to maintain the current k values.

Footnotes

[3] Jain P, Wally J, Townsend TG, Krause M, Tolaymat T (2021) Greenhouse gas reporting data improves understanding of regional climate impact on landfill methane production and collection. PLoS ONE 16(2): e0246334. https://doi.org/10.1371/journal.pone.0246334

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Prof. Nickolas J. Themelis
Commenter Affiliation: Earth Engineering Center, Columbia University
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0228-A1
Comment Excerpt Number: 2

Comment Excerpt: There is no reason to decrease the degradable organic carbon (DOC) content of MSW landfilled throughout the country. A 2010 study (https://ascelibrary.org/doi/abs/10.1061/%28ASCE%29EE.1943-7870.0000189?download=true) of the biogenic (*i.e.*, biodegradable) carbon in the stack gas of 40 U.S. waste-to-energy power showed the DOC to be 0.2 (20%) across the U.S., *i.e.*, the same as the current default value of DOC used by EPA. The U.S. MSW landfills receive the same MSW as the waste-to-energy plants and inert waste that should go to C&D landfills and not to MSW landfills.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Darrell K. Smith and David Biderman
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0237-A1
Comment Excerpt Number: 1

Comment Excerpt: Facilities reporting to Subpart HH of the GHGRP may use one of three options noted below to characterize their waste streams. EPA has proposed a rule to revise degradable organic carbon (DOC) values for landfills for these options (as shown).
1) Bulk Waste Option— assumes single stream of mixed solid waste.
2) Modified Bulk MSW Option-— facilities can characterize waste into 3 streams: construction & demolition debris (C&D), inerts, municipal solid waste (MSW) (which excludes the prior 2 streams).
3) Waste Composition Option — facilities can characterize waste into a variety of categories where each category has a specific DOC value assigned based in IPCC recommended values.

As referred to in the proposed rule, EREF published a report on DOC values and estimated values using multiple state-based composition studies. A comparison of the current DOC, proposed DOC, and EREF values for the Bulk and Modified Bulk MSW options are shown below.

Comparison of Current/Proposed EPA and EREF DOC Values

Option	Current EPA	Proposed EPA	EREF

Bulk Waste	0.20	0.17	0.161 (Range: 0.118 - 0.180)
Modified Bulk MSW	0.31	0.27	0.184 (Range: 0.142 - 0.209)

The proposed bulk waste DOC value of 0.17 falls within the range of values computed by EREF, suggesting that independent research using a different approach supports EPA's multivariate analysis. For the modified bulk method, EPA's proposed DOC value for MSW has been reduced by approximately 10% from 0.31 to 0.27. However, the proposed value is approximately 47% higher than EREF's estimate of 0.18. Further, the proposed value is outside the range of EREF's values, suggesting that there is a discrepancy between the approaches used by the EPA and EREF to compute these values.

A memorandum[1] dated June 18, 2019 stated the discrepancy lies in the interpretation of the "inerts" waste stream. EREF's approach considers the waste accepted at a facility in three discrete streams:

- Bulk MSW, which contains inerts such as plastic bottles, metal and glass (aligning to the standard MSW definition used by EPA's Advancing Sustainable Materials Management: Facts and Figures reports);
- Bulk C&D, which may contain inerts such as concrete and tile; and
- Inerts (*e.g.*, inert special wastes).

While EREF's approach excluded inerts from C&D and special waste (as these are not considered to be MSW), it does not exclude inerts from MSW waste itself. As such, EREF's approach estimated the composition-based DOC values for bulk MSW (*i.e.*, DOC as a percent of total MSW) consistently with the accepted approach for bulk C&D (*i.e.*, DOC as a fraction of total C&D).[2] This approach is also consistent with the realities of landfill operations, as inerts from C&D and special wastes (aka non-MSW inerts) can be easily distinguished by landfill personnel via visual inspection of loads at the scale house. Thus, this definition of inerts aligns with industry practice and the types of data collected and tracked on site at the majority of landfills in the U.S.

However, as highlighted in the referenced memorandum,[1] EPA's definition of inerts would include all inerts in the waste stream, including MSW inerts such as plastic, metal and glass. Incoming MSW to a landfill is generally counted by the truckload without further segregation making any estimates of the fraction of MSW inerts impractical. The only way to reliably estimate inerts is through a waste audit. Thus, to comply with this definition would require a landfill owner to conduct a waste characterization study so that the fraction of inerts can be estimated. This effectively renders the Modified Bulk MSW option useless since a waste characterization study (required to adjust bulk MSW for MSW inerts) would instead allow a landfill owner to use the Waste Composition approach to compute DOC.

To better understand how landfill owners interpret the Modified Bulk MSW option, two evaluations were performed examining the reported fraction of the three waste types reported under the method: MSW, C&D, and inerts. Specifically, this evaluation looked at how often facilities are reporting 100% bulk MSW (and thus no inerts/other materials) and the reported fraction of inerts for those using Modified Bulk MSW option.

Analysis of the publicly available Subpart HH reporting data indicates that nearly one-quarter of facilities using the Modified Bulk MSW option report no inerts (*i.e.*, report 100% bulk MSW) and 85% of facilities reporting inerts in addition to bulk MSW are reporting very low levels (<5% inerts). Given that the average fraction of inerts in MSW 37.7% (based on EREF analysis) and 37-38% based on the data presented in the memorandum,[1] this strongly suggests that:

- EPA is receiving information inconsistent with the assumption that the MSW stream in the Modified Bulk MSW option reflects only organic MSW, and
- It is inappropriate to apply a DOC value of 0.31 (or the proposed 0.27) to the bulk MSW data reported under the Modified Bulk MSW option.

Therefore, continued use of a DOC value for bulk MSW that is exclusive of MSW inerts does not align with landfill operational limitations and the perceived intent of establishing a Modified Bulk MSW option in the first place: achieving a more accurate estimate of GHG emissions (relative to the Bulk Waste option) by allowing owners to report site-specific conditions without the substantial cost and time of implementing the Waste Composition option. Instead, the Modified Bulk MSW approach should allow the MSW Landfill to use the same Bulk MSW DOC of 0.17 as the Bulk MSW approach.

Footnotes

[1] Memorandum from Jeff Coburn, RTI International, to Rachel Schmeltz, EPA, Modified Bulk MSW Option Update, June 18, 2019, available in the docket for this rulemaking, Docket Id. No. EPA-HQ-OAR-2019-0424.

[2] This bulk MSW approach is consistent with the approach used by both EREF and RTI International to estimate the DOC for C&D waste—that is the DOC for C&D waste is inclusive of C&D inerts and exclusive of any other inerts (*e.g.*, MSW, special waste). The justification for EPA's incongruous methods for MSW vs C&D is not provided in the memorandum.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 8

Comment Excerpt: Under the GHGRP requirements set forth in subpart HH, EPA allows landfill operators two options when estimating landfill methane emissions. The first option is based on a method that attempts to estimate emissions based on the amount of decomposable material in the waste coupled with a decay rate that is influenced by multiple factors. This approach is generally referred to as a "first-order decay" method. The second, which is available only for landfills that have a gas collection and control system installed, is an approach that starts with the amount of gas recovered from the system and back-calculates from there to arrive at an

emissions estimate. There are also multiple assumptions built into this approach, particularly with respect to the efficiency of gas capture systems and oxidation of methane in cover material placed on top of the waste. In addition, a landfill operator whose site includes a gas capture and control system is afforded essentially unfettered discretion in selecting which method to use.

Historically, these two approaches — the first-order decay approach and the back-calculation approach - have often resulted in dramatically different values for the same landfill. Two of the largest landfills in Maryland provide examples of this problem:

- In 2020, for the Quarantine Road Landfill in Baltimore City, using the first-order decay method results in a value of 89,766 metric tons of carbon dioxide equivalents ("CO_2e"). When using the back-calculation method, the emission value in 2020 is less than half of that at 38,436 metric tons of CO_2e. This landfill operator chose to report using the lower value based on the back-calculation method.
- In 2020, for the Brown Station Road Landfill in Prince George's County, the first-order decay method results in 98,080 metric tons of CO_2e and the back-calculation method estimates slightly higher emissions at 104,426 metric tons of CO_2e. This landfill operator chose to report using the second, higher value.

As demonstrated above, one approach does not consistently produce higher emissions estimates than the other. However, our analysis of 2020 data indicates that the back-calculation method generates lower emissions estimates than the first-order decay method for about 73% of reporting landfills.

Response: We acknowledge that there are uncertainties in both calculation methods, which lead to discrepancies between their emissions estimates. The analyses conducted to support the proposed revisions are expected to improve the agreement between the two methods; however, based on the composition of waste disposed, there will still be cases where one method may provide higher or lower emissions than the other option. Requiring facilities to use both methods provides us the data needed to make these comparisons and analyses. We also proposed revisions to improve the agreement between the two methods. For example, we proposed and are finalizing revisions to the first-order decay approach and the back-calculation approach to better account for methane emission events associated with poorly operating or non-operating gas collection systems and/or destruction devices. We also proposed and are finalizing the use of lower default gas collection efficiencies in the back-calculation approach, as described in section III.T of the rule preamble.

Commenter Name: John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele
Commenter Affiliation: RMI
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0234-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA states that lowering the DOC values and raising the k values will affect closed and open landfills in the following different ways:

- Active landfills. The higher k values will increase the emissions calculated for open, active landfills. The higher k values imply that the organic material will degrade more quickly than predicted when using lower k values. This leads to greater calculated emissions from active landfills.
- Closed landfills. With higher k values, less degradable waste is calculated to remain in the landfill by the time it closes (*i.e.*, no longer receives wastes) and the remaining degradable waste that is present in the closed landfill will decompose more quickly. This tends to reduce the emissions calculated for closed landfills, which may allow closed landfills to more quickly fall below the reporting threshold.
- The cumulative estimated emissions from a landfill over its entire life (active and closed periods) depend on the amount of degradable organic material placed in the landfill, which is represented by the DOC value applied to the total quantity of waste received. Thus, the lower DOC values should reduce the cumulative emissions reported for a given landfill over all reporting years.

For landfills with gas capture systems (GCS), EPA also requires operators to estimate the volume of methane generated by back-calculating from the volume of methane captured, applying a specified assumed collection efficiency that depends on the landfill cover condition. The collection efficiency is specified as 0% for areas without active gas collection, 60% for areas with active collection and daily soil cover, 75% for areas with active collection and intermediate soil cover, and 95% collection for areas with active collection and final soil cover (40 CFR Part 98, Subpart HH, Table HH–3). EPA directs operators to calculate the landfill's emissions using each of these two methods for calculating the methane generation (modeled using the first-order decay equation and back-calculated using the assumed capture efficiency). The operator must then report emissions from the landfill using the approach that "best represents the emissions from the landfill" (40 CFR 98.346(4)(13)).

It is widely acknowledged by EPA and others that there is high uncertainty around the estimates of methane generation by (and thus emissions from) landfills that are based on the first order decay model, which underlies equation HH–1 in Subpart HH.[20] With respect to the back-calculation method used in equation HH–7, EPA has suggested that there is "less uncertainty" in EPA's GHGRP data because this methodology is facility specific, uses directly measured methane (CH_4) recovery data (when applicable), and allows for a variety of landfill gas collection efficiencies, destruction efficiencies, and/or oxidation factors to be used.[21] However, while the CH_4 recovery volumes are indeed directly measured, and thus should be relatively reliable, deriving estimates of both CH_4 generation and emissions from the amounts recovered depends entirely on the accuracy of the assumed collection efficiencies, destruction efficiencies, and oxidation factors applied, each of which appear to be far more uncertain than EPA implies. To put it simply, EPA's approach uses highly uncertain "unknown" values (*e.g.*, the percentage of generated methane that is oxidized, captured, and destroyed at a specific landfill over time) and one "known" value (the amount of methane captured) to calculate another unknown, and thus the result cannot be anything other than highly uncertain.

In addition, the directive to the operator to select between the two approaches for estimating methane generation — and hence emissions — is entirely unbounded by any guidance regarding which approach might "better represent" a given landfill's emissions. In practice, it appears highly likely that most operators simply select the lower estimate (EPA notes in the proposal that over 70% of operators report emissions based on the back-calculation approach). These problems are exacerbated by the fact that the current and proposed estimation approaches do not account for the emissions from abnormal operational conditions, such as large leaks, which have been identified through observations as the source of massive quantities of emissions.

Footnotes

[20] See, *e.g.*, National Academies of Sciences, Engineering, and Medicine. (2018). Improving Characterization of Anthropogenic Methane Emissions in the United States. (http://nap.edu/24987), EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020, 7-14; Inside Climate News/NPR, EPA Struggles to Track Methane Emissions (July 13, 2021) https://insideclimatenews.org/news/13072021/epa-struggles-to-track-methane-emissions-from-landfills-heres-why-it-matters/); US. EPA, Assessment of Municipal Solid Waste Energy Recovery Technologies: Final Report (Dec. 2020).

[21] Id.

Response: See response to comment EPA-HQ-OAR-2019-0424-0226-A1, Excerpt 8.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 72

Comment Excerpt: With respect to the back-calculation method used in equation HH–7, EPA has suggested that there is "less uncertainty" in EPA's GHGRP data (which is largely derived from the back-calculation method) "because this methodology is facility-specific, uses directly measured CH_4 recovery data (when applicable), and allows for a variety of landfill gas collection efficiencies, destruction efficiencies, and/or oxidation factors to be used.[163] Unfortunately, however, while the CH_4 recovery volumes are indeed directly measured, and thus should be relatively reliable, deriving estimates of both CH_4 generation and emissions from the amounts recovered depends entirely on the accuracy of the assumed collection efficiencies, destruction efficiencies, and oxidation factors applied, each of which appear to be far more uncertain than EPA implies. EPA's approach thus uses highly uncertain "unknown" values (*e.g.*, the percentage of generated methane that is oxidized, captured, and destroyed at a specific landfill over time) and one "known" value (the amount of methane captured) to calculate another unknown, and the result cannot be anything other than highly uncertain. In addition, the directive to the operator to select between the two approaches for estimating methane generation — and hence emissions — does not include any guidance regarding which approach might "better represent" a given landfill's emissions. In practice, it appears highly likely that most operators simply select the

lower estimate (EPA notes in the proposal that over 70% of operators report emissions based on the back-calculation approach). These problems are exacerbated by the fact that the current and proposed estimation approaches do not account for the emissions from abnormal operational conditions, such as large leaks, which have been identified through observations as the source of massive quantities of emissions, as discussed above.

Response: See response to comment EPA-HQ-OAR-2019-0424-0226-A1, Excerpt 8.

Commenter Name: John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele
Commenter Affiliation: RMI
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0234-A1
Comment Excerpt Number: 8

Comment Excerpt: Waste composition, specifically the degradable organic carbon (DOC) content in landfilled waste, is a key driver of methane generation potential. Under Subpart HH (Eq. HH-1), reporters can choose one of three options to characterize their waste:

- The Bulk Waste option assumes a single stream of waste that contains a mixture of organic and inorganic waste. Reporters use a single default value for DOC and choose one of three decay rate (k) values based on annual rainfall.
- The Modified Bulk Waste option allows facilities to break down their waste into three streams: organic waste, construction & demolition (C&D) waste, and inert waste. Reporters use a higher DOC for the organic waste, a lower DOC for the C&D waste, and a DOC of zero for the inert waste. The k values for organic and C&D waste vary based on annual rainfall.
- The Waste Composition option further breaks down the waste stream into subcategories (*e.g.*, food, garden, paper, wood, textile, diapers, sewage sludge, and inert waste), each with their own DOC and k values (also precipitation adjusted), and use bulk waste assumptions when compositional data is not available.

EPA is proposing changes to DOC and k values, based largely on a multivariate analysis that takes 2012-17 GHGRP data and optimizes DOC and k to minimize the difference between methane generation estimates in HH-1 (first order decay) and HH-7 (the back-calculated approach). The agency also reviewed updated municipal solid waste composition data from 2011 to 2015 under the Advancing Sustainable Materials Management survey, and the k values used in other countries' inventories and as recommended by the IPCC.

Specifically, EPA proposes to lower the Bulk Waste DOC to 0.17 from 0.20 and lower the Modified Bulk Waste (organic) DOC to 0.27 from 0.31. EPA also introduces an uncharacterized waste category under the Waste Composition option with a DOC of 0.32. EPA's proposed

changes to k values reflect the same multivariate analysis and the proposed revisions to DOC (as k-values are linked to waste composition).

There are several challenges with EPA's approach to the DOC and associated k values. First, waste composition can vary meaningfully by landfill, due to differences in population, industry, and the state and local regulatory landscape.[22] Default bulk and modified bulk DOC values fail to capture the site-level differences in waste composition that can impact methane generation. This is especially important given the vast majority of landfills use the Bulk or Modified Bulk default values under GHGRP. A 2018 study found that of 1,147 landfills reporting to GHGRP, nearly 99% reported no more than three waste types at any point in their history, and most sites (57%) reported a single, lump sum waste quantity each year. Importantly, data gathered from state environmental agencies showed more detail in terms of major waste types landfilled, suggesting landfill owners and operators have more knowledge of different waste type quantities than what is reflected in the GHGRP dataset.[23]

Second, the newly proposed DOC and k values are based on a multivariate analysis of previously reported data under GHGRP (2012-2017). This analysis optimizes DOC and k to align with the back-calculated methane generation estimates under Equation HH–7, even though HH–7 relies on highly uncertain collection efficiency rates, as we discuss further below. EPA cross-references the multivariate analysis with 2011-2015 data from the Advancing Sustainable Materials Management survey, but this data is gathered using a materials flow approach (leveraging nationwide production data with adjustments for imports, exports, and diversion) rather than site-specific inputs.[24]

We recommend EPA collect waste characterization data from landfills, as this is a key input for methane generation estimates under HH-1. Specifically, EPA should require landfills to report waste composition data on an annual basis under the GHGRP. Operators should be required to report based on site-level waste sampling studies performed in accordance with standards specified by EPA that detail measurement techniques and frequency, such as the ASTM standards for manual sorting of truckload samples, to avoid potential mischaracterization of waste composition.

Studies suggest that many landfills and municipalities collect this information already. As discussed above, state and local GHG inventories often contain more refined waste stream data, despite the fact that the vast majority of landfills currently choose the Bulk or Modified Bulk Waste option for DOC and k values when reporting under GHGRP.[42] While there would be additional costs to standardize measurement techniques across landfills and bring waste characterization capabilities to landfills that do not have them already, we note EPA has funding available that can help support data collection efforts, such as under the Solid Waste Infrastructure for Recycling (SWIFR) grant program ($55 mn per year available from FY2022-26, including to support state and local data needs).[43]

Over the near term, we recommend EPA use the site-level waste composition data to inform more representative DOC and k values for the Bulk and Modified Bulk Waste options under Subpart HH. Over the medium term, and once landfills have the necessary infrastructure in place to support ongoing waste characterization studies, EPA should phase out the Bulk and Modified Bulk options in favor of the Waste Composition option. This would improve the accuracy of bottom-up methane generation estimates under Subpart HH and is also critical for monitoring

progress in organics diversion efforts — a key strategy to mitigate methane emissions at landfills.

Footnotes

[22] U.S. Environmental Protection Agency. MSW Characterization Methodology. https://www.epa.gov/sites/default/files/2015-09/documents/06numbers.pdf

[23] Jon T Powell et al. (2018) Quantity, Components, and Value of Waste Materials Landfilled in the United States. Journal of Industrial Ecology. 23(2): 466-479. https://onlinelibrary.wiley.com/doi/10.1111/jiec.12752

[24] U.S. Environmental Protection Agency. MSW Characterization Methodology. https://www.epa.gov/sites/default/files/2015-09/documents/06numbers.pdf

[42] Jon T Powell et al. (2018) Quantity, Components, and Value of Waste Materials Landfilled in the United States. Journal of Industrial Ecology. 23(2): 466-479. https://onlinelibrary.wiley.com/doi/10.1111/jiec.1275.

[43] U.S. Environmental Protection Agency. Solid Waste Infrastructure for Recycling Grant Program. https://www.epa.gov/rcra/solid-waste-infrastructure-recycling-grant-program.

Response: We agree with commenters that there is site-specific variability in DOC based on wastes collected. Subpart HH includes a waste composition option; however, few facilities have the data needed to utilize this approach. Waste characterization studies would lead to limited improvements in accuracy because the waste characterization determinations are somewhat subjective. Also, while we agree the waste-type-specific DOC values have less variability and uncertainty than bulk waste DOC, the DOC for specific waste types still has considerable uncertainty. For these reasons, we included the waste composition method as an option for reporters in the original subpart HH rule, but we did not require that they use it. We remain of the opinion that the additional costs of conducting on-going waste characterization studies at individual landfills are not worth the often-limited improvement in the accuracy when applying the first-order decay model. We did not make additional revisions to subpart HH as a result of these comments.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 73

Comment Excerpt: There are several challenges with EPA's approach to the DOC and associated k values. First, waste composition can vary meaningfully by landfill, due to differences in population, industry, and the state and local regulatory landscape.[164] Default bulk and modified bulk DOC values fail to capture the site-level differences in waste composition that can impact methane generation. This is especially important given the vast majority of landfills use the bulk or modified bulk default values under GHGRP. A 2018 study found that of 1,147 landfills reporting to the GHGRP, nearly 99% reported no more than three waste types at any

point in their history, and most sites (57%) reported a single, lump sum waste quantity each year. Importantly, data gathered from state environmental agencies showed more detail in terms of major waste types landfilled, suggesting landfill owners and operators have more knowledge of different waste type quantities than what is reflected in the GHGRP dataset.[165]

Second, the newly proposed DOC and k values are based on a multivariate analysis of previously reported data under GHGRP (2012-2017). This analysis optimizes DOC and to align with the back-calculated methane generation estimates under Equation HH–7, even though HH–7 relies on highly uncertain collection efficiency rates, as we discuss further below. EPA cross-references the multivariate analysis with 2011- 2015 data from the Advancing Sustainable Materials Management survey, but this data is gathered using a materials flow approach (leveraging nationwide production data with adjustments for imports, exports, and diversion) rather than site-specific data.[166] To improve the accuracy of methane generation estimates, EPA should collect comprehensive waste characterization data from landfills to inform more representative DOC and k values for the Bulk Waste options, and also consider requiring reporters to use the Waste Composition option, especially given many landfills and municipalities collect this data already.

We recommend EPA collect waste characterization data from landfills under the GHGRP, as this is a key input for methane generation estimates under HH-1. Specifically, EPA should require landfills to report waste composition data on an annual basis under the GHGRP. Operators should be required to report based on site-level waste sampling studies performed in accordance with standards specified by EPA that detail measurement techniques and frequency, such as the ASTM standards for manual sorting of truckload samples, to avoid potential mischaracterization of waste composition.

Studies suggest that many landfills and municipalities collect this information already. As discussed above, state and local greenhouse gas inventories often contain more refined waste stream data, despite the fact that the vast majority of landfills currently choose the Bulk or Modified Bulk Waste option for DOC and k values when reporting under GHGRP.[189] While there would be additional costs to standardize measurement techniques across landfills, and bring waste characterization capabilities to landfills that do not have them already, we note EPA has funding in place that can help support data collection efforts, such as under the Solid Waste Infrastructure for Recycling (SWIFR) grant program.[190]

Over the near term, we recommend EPA use the site-level waste composition data to inform more representative DOC and k values for the Bulk and Modified Bulk Waste options under subpart HH. Over the medium term, and once landfills have the necessary infrastructure in place to support ongoing waste characterization studies, EPA should phase out the Bulk and Modified Bulk options in favor of the Waste Composition option. This would improve the accuracy of bottom-up methane generation estimates under subpart HH and is also critical for monitoring progress in organics diversion efforts — a key strategy to mitigate methane emissions at landfills.

Footnotes

[164] EPA MSW Characterization Methodology, https://www.epa.gov/sites/default/files/2015-09/documents/06numbers.pdf.

[165] Jon T. Powell et al., Quantity, Components, and Value of Waste Materials Landfilled in the United States, 23 J. Indus. Ecology 466 (2018), https://onlinelibrary.wiley.com/doi/10.11 1 I/jiec.12752.

[166] EPA MSW Characterization Methodology, https://www.epa.gov/sites/default/files/2015-09/documents/06numbers.pdf

[189] Jon T. Powell et al., supra note 165.

[190] EPA, Solid Waste Infrastructure for Recycling Grant Program, https://www.epa.gov/rcra/solid-wasteinfrastructure- recycling-grant-program.

Response: See response to comment EPA-HQ-OAR-2019-0424-0234-A1, Excerpt 8.

Commenter Name: Michael E. Van Brunt, P.E.
Commenter Affiliation: Covanta
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0204-A1
Comment Excerpt Number: 2

Comment Excerpt: A 2013 peer-reviewed study found the typical landfill emissions model used underestimated emissions.[3] Direct measurement of landfill methane plumes has corroborated this conclusion. UNEP summarized some of the recent data as follows:

> "{R]emote sensing from aircraft has been used to quantify emissions from specific sources with relatively high accuracy, based on flights of independent instruments on different aircraft... These data have shown that many bottom-up estimates are incorrect."[4]

Across a series of recent studies employing direct measurement of methane plumes via aircraft downwind of landfills, actual measured emissions from landfills have averaged twice the amount reported in GHG inventories. [5-11] Actual emissions from specific landfills have been measured over 14X greater than reported. As part of its justification for its proposed modeling changes, the EPA states the need for landfill operators to be able to account for inert materials in the waste stream. However, effective mechanisms already exist for the exclusion of inert materials from consideration for methane generation, diminishing the need for the proposed regulatory action as the EPA works to reconcile its models with measured emissions.

The methodology already available to landfill operators allows for the user to choose between three different options for calculating DOC and decay rate (k-value) of landfilled waste. Two of these, the Modified Bulk Waste and Waste Composition options, allow the operator to separate inert material from the rest of waste being landfilled. Two of these, the Modified Bulk Waste and Waste Composition options, allow the operator to separate inert material from the rest of waste being landfilled.

Over two thirds of landfills are already appropriately taking advantage of the system in its current state. For the 11 total reporting years GHGRP data is made available, the share of landfills choosing to report using the Bulk Waste option that doesn't account for inert waste

separately, has never exceeded 32% of the total.[12] As of 2020, only 28% of landfill operators did not separate out inert materials using either of the other two available options.

To improve emission quantification and confidence in the inventory, the EPA should take steps to rectify the reporting of inert material. Landfill operators are currently reporting under the "Waste Composition" methodology to reach a lower overall DOC without providing waste composition data beyond accounting for inert materials. For the year 2020, 90.5% of landfills that selected the Waste Composition option reported only bulk waste and inert materials, which does not equate to a typical waste composition analysis. The EPA should clarify the use of the "Waste Composition" methodology and "Modified Bulk Waste Options" to ensure proper use.

Accurate quantification of landfill methane emissions is critical, more so than ever. The United Nations Environment Programme (UNEP) concluded in its recent Global Methane Assessment that mitigating methane emissions is the 'strongest lever' we have for avoiding the most severe impacts of climate change.[13] The changes to the GHGRP as proposed by the EPA will reduce reported emissions from landfilling just as new research is showing landfill methane emissions are actually higher. In doing so, EPA is inadvertently undermining efforts to divert organics from landfills. Alternatives such as recycling, composting, anaerobic digestion, and energy recovery are prioritized in large part due to their ability to avoid landfill methane emissions. Underreporting of landfill emissions undervalues the important benefits these alternatives bring to addressing global climate change.

To ensure that we have as accurate data as possible to inform effective policies, we strongly recommend that the EPA either combine its current proposal with other changes to the landfill models to bring the results into better alignment with peer-reviewed measurements or that the EPA defer any changes to the landfill models until the broader work can be completed.

Footnotes

[3] Amini, H.R., D. Reinhart, A. Niskanen (2013) Comparison of first-order-decay modeled and actual field measured municipal solid waste landfill methane data, Waste Management33: 12 (December 2013), 2720 — 2728.

[4] See p. 34 of United Nations Environment Programme and Climate and Clean Air Coalition (2021). Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions. Nairobi: United Nations Environment Programme. https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions

[5] Peischl et al. (2013) Quantifying sources of methane using light alkanes in the Los Angeles basin, California, Journal of Geophysical Research: Atmospheres, 118: 4974-4990. https://doi.org/10.1002/jgrd.50413

[6] Wecht et al. (2014) Spatially resolving methane emissions in California: constraints from the CalNex aircraft campaign and from present (GOSAT, TES) and future (TROPOMI, geostationary) satellite observations, Atmos. Chem. Phys. 14, 8173- 8184. https://www.atmos-chem-phys.net/14/8173/2014/acp-14-8173-2014.pdf

[7] Cambaliza et al. (2015) Quantification and source apportionment of the methane emission flux from the city of Indianapolis, Elementa: Science of the Anthropocene,3:37. https://www.elementascience.org/articles/10.12952/journal.elementa.000037/

[8] Cambaliza et al. (2017) Field measurements and modeling to resolve m2 to km2 CH, emissions for a complex urban source: An Indiana landfill study, Elem Sci Anth, 5: 36, https://doi.org/10.1525/elementa.145

[9] Ren et al. (2018) Methane Emissions From the Baltimore-Washington Area Based on Airborne Observations: Comparison to Emissions Inventories, Journal of Geophysical Research: Atmospheres, 123, 8869-8882. https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2018JD028851

[10] Jeong, S., et al. (2017), Estimating methane emissions from biological and fossil-fuel sources in the San Francisco Bay Area, Geophys. Res. Lett., 44, 486-495 https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016GL071794

[11] Hanson, J., et al. (2020), Estimation and Comparison of Methane, Nitrous Oxide, and Trace Volatile Organic Compound Emissions and Gas Collection System Efficiencies in California Landfills, The California Air Resources Board (CARB). https://ww2.arb.ca.gov/sites/default/files/2020-12/CalPoly LFG Study 03-30-20.pdf

[12] USEPA. Greenhouse Gas Customized Search. Accessed August 10, 2022. https://www.epa.gov/enviro/greenhouse-gascustomized-search

[13] United Nations Environment Programme (UNEP), 2021. Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions. URL: https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costsmitigating-methane-emission

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Markus Videnieks
Commenter Affiliation: Circular Economy Coalition (CEC)
Commenter Type: Other
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0208-A1
Comment Excerpt Number: 2

Comment Excerpt: A 2013 peer-reviewed study found the typical landfill emissions model used underestimated emissions.[3] Direct measurement of landfill methane plumes has corroborated this conclusion. UNEP summarized some of the recent data as follows:

"[R]emote sensing from aircraft has been used to quantify emissions from specific sources with relatively high accuracy, based on flights of independent instruments on different aircraft ... These data have shown that many bottom-up estimates are incorrect."[4]

Across a series of recent studies employing direct measurement of methane plumes via aircraft downwind of landfills, actual measured emissions from landfills have averaged twice the amount reported in GHG inventories. [5-6] Actual emissions from specific landfills have been measured over 14X greater than reported.

Accurate quantification of landfill methane emissions is critical, more so than ever. The United Nations Environment Programme (UNEP) concluded in its recent Global Methane Assessment, that mitigating methane emissions is the 'strongest lever' we have for avoiding the most severe impacts of climate change.[7] The changes to the GHGRP as proposed by the EPA will reduce reported emissions from landfilling just as new research is showing landfill methane emissions are actually higher.

In doing so, EPA is inadvertently undermining efforts to divert organics from landfills. Alternatives such as recycling, composting, anaerobic digestion, and energy recovery are prioritized in large part due to their ability to avoid landfill methane emissions. Underreporting of landfill emissions undervalues the important benefits these alternatives bring to addressing global climate change.

To ensure that we have as accurate data as possible to inform effective policies, we strongly recommend that the EPA either combine its current proposal with other changes to the landfill models to bring the results into better alignment with peer-reviewed measurements or that the EPA defer any changes to the landfill models until the broader work can be completed.

Footnotes

[4] See p. 34 of United Nations Environment Programme and Climate and Clean Air Coalition (2021). Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions. Nairobi: United Nations Environment Programme. https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions

[5] Peischl et al. (2013) Quantifying sources of methane using light alkanes in the Los Angeles basin, California, Journal of Geophysical Research: Atmospheres, 118: 4974-4990. https://doi.org/10.1002/jerd.50413

[6] Jeong, S., et al. (2017), Estimating methane emissions from biological and fossil-fuel sources in the San Francisco Bay Area, Geophys. Res. Lett., 44, 486-495 https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016GL071794 United Nations Environment Programme (UNEP), 2021. Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions. URL: https://www.unep.org/resources/report/global-methane-assessmentbenefits-and-costs-mitigating-methane-emissions

[7] United Nations Environment Programme (UNEP), 2021. Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions. URL: https://www.unep.org/resources/report/global-methane-assessmentbenefits-and-costs-mitigating-methane-emissions

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: David Vollero
Commenter Affiliation: York County Solid Waste and Refuse Authority, Pennsylvania
Commenter Type: State Government/Regulatory Agency
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0231-A1
Comment Excerpt Number: 1

Comment Excerpt: While we appreciate the EPA reevaluating aspects of the Greenhouse Gas Reporting Program to improve the accuracy of GHG emissions data, we are deeply concerned that the proposed changes include altering the default values applied for degradable organic carbon content of municipal solid waste managed at landfills, as well as the default values for decay rate. These changes will reduce the reported emissions from landfills, but the changes will not result in more accurate estimates of landfill emissions as stated by the EPA.

A number of recent studies have found that landfill methane emissions are significantly greater than those currently reported in the Greenhouse Gas Reporting Program. **The EPA should either require landfills to measure their actual emission with technology that currently exists, or they should model landfill emissions based on actual recent measurements of landfill methane emissions.**

The United Nations Environment Programme's recent Global Methane Assessment concludes that mitigating methane emissions is the 'strongest lever' we have for avoiding the most severe impacts of climate change. The proposed changes to the Greenhouse Gas Reporting Program will inaccurately reduce reported emissions from landfilling, contrary to the findings of the most recent research. We hope that the EPA will follow the latest science and not artificially reduce landfill emissions without conclusive supporting data.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Institute for Energy and Resource Management (IeRM)
Commenter Type: Academia
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0189-A1
Comment Excerpt Number: 1

Comment Excerpt: Changing the model based on waste characterization is meaningless without reliable, independently acquired data regarding landfill emissions. There is an extensive body of literature that demonstrates that the use of models alone to characterize gas emissions from landfills has been inaccurate. Several recent studies, such as the study conducted for the California Air Resources Board by NASA's Jet Propulsion Laboratory in 2017-2018, found wide variations in methane emissions from 270 landfills surveyed. US EPA engineers have stated that the agency has "been underestimating methane emissions from landfills by a factor of two." (NPR, All Things Considered, July 13, 2021.) The Environmental Integrity Project, in a study dated June 9, 2021, found that Maryland's landfill methane emissions were four times higher than the state had estimated. Rather than tinkering with the model to benefit the landfill industry, USEPA should require hard data, independently acquired and quality assured.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 9

Comment Excerpt: In the proposed rule, EPA presents a plan to revise variables that are part of the first-order decay approach for two composite waste streams and to add set of variables for a third composite waste stream. For one of the two existing composite waste streams addressed in the proposed revisions, the Bulk Waste option (essentially mixed municipal solid waste "MSW")), EPA is intentionally bringing the results of this approach into closer agreement with the estimates produced by the back-calculation method. For the other existing waste stream, the Modified Bulk Waste option (mixed MSW minus inerts and construction and demolition debris), EPA's revisions were based on its analysis of data indicating recent changes in the composition of the waste stream. EPA also notes that it is revising these factors in response to repeated industry requests to lower the values for one factor, DOC, due to alleged changes in the waste stream.

EPA has proposed to establish new variables for two factors used in its HH–1 equation for estimating uncontrolled methane emissions (referred to as "methane generation"). These variables are DOC and k. In essence, the degradable organic carbon ("DOC") factor relates to the amount of organic material in the waste and the k factor relates to the decay rate of waste within a landfill. These are two key variables affecting the estimated methane produced each year. EPA is proposing to lower the values for the DOC factor and increase the values for the k factor. [See DCN EPA-HQ-OAR-2019-0424-0226-A1 for Table 1. Comparison of Current DOC Default Values to Proposed DOC Values and Table 2.Comparison of Current k Default Values to Proposed k Values for Bulk Waste and Modified Bulk Waste.]

In sum, EPA expects these changes to result in higher methane emissions earlier in the decay process and lower methane emissions later in the process. It also expects that total emissions over a landfill's lifetime will be reduced.

EPA arrived at the revised values for DOC and k based on its own analyses. For the Bulk Waste option, the Agency conducted a multivariate analysis intended to bring the results of the first-order decay approach into closer agreement with the results of the back-calculation approach. For the Modified Bulk Waste option, EPA lacked sufficient data to conduct a multivariate analysis so it "reanalyzed the DOC … using the same approach used to develop this factor initially but with updated MSW composition data from 2011 to 2015 as reported by the EPA. In essence, EPA took a set of more recent data on the composition of the waste stream, which indicates increasing amounts of food waste and decreasing paper and paperboard, and applied the waste-specific DOC values established by the International Panel on Climate Change ("IPCC"). [See DCN EPA-HQ-OAR-2019-0424-0226-A1 for Table 3. IPCC DOC Values by Waste Type.[7]]

Although EPA conducted its own analyses, it did so in response to comments from industry recommending lower DOC values for the Bulk Waste and Modified Bulk Waste streams. For Bulk Waste, EPA notes in the preamble that its proposed DOC value of 0.17 is similar to industry's proposal of 0.161. For Modified Bulk Waste, EPA states that revised DOC value of 0.27 disagrees with industry's proposal for a far lower value of 0.191.[9]

Both of EPA's approaches for estimating landfill emissions under the GHGRP are based on numerous assumptions and, therefore, uncertain. In addition, scientific studies, some of which are based on direct measurement, have repeatedly shown that the GHGRP is underestimating greenhouse gas emissions from landfills. For example:

- A Baltimore and Washington, DC area study that used aircraft to measure methane emissions demonstrated that emissions from landfills were nearly double the emissions estimates from EPA's Greenhouse Gas Reporting Program.[10] Emissions from one of the largest landfills in Maryland were nine times greater than the Greenhouse Gas Reporting Program estimated.[11]
- Researchers who used aircraft to measure methane emissions from landfills in the San Francisco area concluded that landfills were the most under-reported methane source in the study area and that emissions were likely double the estimates from the Greenhouse Gas Reporting Program.[12]
- Researchers who evaluated 5 to 8 years of annual methane collection data from 114 closed landfills nationwide determined that "MSW landfills are emitting more methane than estimated..." using the methods employed in EPA's AP-42 factors, as well as the closely related methods employed by EPA's Greenhouse Gas Reporting Program.[13]

For these reasons, EPA should be moving toward an approach that is based on direct measurement of greenhouse gas emissions from landfills.

Footnotes

[7] IPCC, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5, Chpt 2, at 2.14, https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf.

[9] Memo from Jeff Coburn, RTI International, to Rachel Schmeltz, U.S. EPA, regarding Modified Bulk MSW Option Update (June 18, 2019).

[10] Xinrong Ren, et al., Methane Emissions from the Baltimore-Washington Area Based on Airborne Observations: Comparison to Emissions Inventories, 123 Journal of Geophysical Research: Atmospheres, at 8,876 (Aug. 20, 2018).

[11] Id. at 8874-76.

[12] Abhinav Guha, et al., Assessment of Regional Methane Emissions Inventories through Airborne Quantification in the San Francisco Bay Area, Environmental Science and Technology, at 2, 20 (July 7, 2020), available at https://authors.library.caltech.edu/104257/1/acs.est.0c01212.pdf.

[13] Pradeep Jain, et al., Greenhouse gas reporting data improves understanding of regional climate impact on landfill methane production and_ collection, PLoS ONE, at 1-3, 10-11 (Feb. 26, 2021), available at https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0246334

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Susan Glickman
Commenter Affiliation: Stop Landfill Pollution

Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0233-A1
Comment Excerpt Number: 1

Comment Excerpt: Stop Landfill Pollution opposes the proposed changes that will make it harder to calculate emissions for municipal solid waste (MSW) landfills and more difficult to address the methane from landfills driving climate change.

As we all are aware, methane has received a lot of attention recently because of President Biden's leadership at COP 23. The Global Methane Pledge, signed by over 100 countries in Glasgow, commits to reducing methane emissions by at least 30 percent from 2020 levels by 2030. In announcing this pledge, the White House stated that, "landfills are the second largest industrial source of methane in the United States."

Despite this acknowledgement of the need to address methane emissions from landfills, proposed changes to the EPA's Greenhouse Gas Reporting Program would move us in the opposite direction. Altering default values applied for degradable organic carbon (DOC) content of waste and decay rate (k-values) will ultimately reduce reported emissions from landfills.

To support the proposed changes, the EPA presents a limited amount of data all from its own models. Not surprisingly, the cumulative effect of these changes would contradict the current understanding of the potential impacts of landfilling waste.

Recent research points to methane and its largest sources including landfills, as significant drivers of human-induced climate change.[1,2,3,4] Even well-operated landfills will ultimately emit significant amounts of methane over their lifetime. The only effective way to reduce these emissions over the long-term, to protect and enrich our communities, is to divert waste away from landfills — not alter how the figures are calculated.

The proposed changes for landfill reporting should be reconsidered using all relevant data, and with deference for actual measurements over modeling. Getting this right isn't just an academic exercise — underreporting landfill gas emissions will artificially diminish the climate benefits brought about by diverting waste to other more sustainable ways of addressing the problem.

Footnotes

[1] Doan, L. (2019, November 6). NASA Flew Gas Detectors Above California, Found 'Super Emitters. Bloomberg. https://www.bloomberg.com/news/articles/2019-11-06/nasa-flew-gas-detectors-above-california-found-super-emitters#xj4y7vzkg

[2] Dreyfus, G.B. et al., 2022. Mitigating climate disruption in time: A self-consistent approach for avoiding both near-term and long-term global warming. The Proceedings of the National Academy of Sciences (PNAS), Earth, Atmospheric, and Planetary Sciences. https://doi.org/10.1073/pnas.2123536119

[3] Bruggers, J., McKenna, P., Green, A., Benincasa, R. (2021, July 13). Your Trash Is Emitting Methane In The Landfill. Here's Why It Matters For The Climate. NPR. https://www.npr.org/2021/07/13/1012218119/epa-struggles-to-track-methane-from-landfills-heres-why-it-matters-for-the-clima

[4] United Nations Environment Programme (UNEP), 2021. Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions. URL: https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions

Response: The EPA appreciates the commenter's input. As noted in section III.T.2 of the preamble to the final rule, while we are decreasing the DOC value from 0.20 to 0.17 based on our analysis and changes in the composition of MSW disposed of in landfills, we are retaining the DOC of 0.20 for all wastes disposed of prior to 2010. This clarification in the application of the revised DOC of 0.17 for more recent disposal years (2010 and later) significantly reduces the impact of the proposed revisions on the modeled emissions (from Equation HH–1). We are continuing to improve the emission calculation estimates in subpart HH, and where possible incorporate direct-measurement data. Note, in the 2023 Supplemental Proposal, we also sought comment for examples of methane data collected from available monitoring methodologies and how such data might be incorporated into subpart HH for estimating annual emissions. We proposed modifying Equations HH–6, HH–7, and HH–8 to incorporate direct-measurement data collected from surface emissions monitoring. While we are not finalizing the proposed reporting requirements to incorporate direct-measurement data collected from surface emissions monitoring at this time, we are reviewing comments on these modifications along with comments received on other methane monitoring technologies and how such data may be incorporated into future subpart HH reporting.

Commenter Name: Michael E. Van Brunt, P.E.
Commenter Affiliation: Covanta
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0204-A1
Comment Excerpt Number: 1

Comment Excerpt: The proposed changes include altering the default values applied for degradable organic carbon ("DOC") content of municipal solid waste (MSW) managed at landfills, as well as the default values for decay rate (k-values). These changes, as acknowledged by the EPA, will reduce the reported emissions from landfills, but the changes will not result in more accurate estimates of landfill emissions as stated by the EPA. While the EPA presents arguments and data supporting the proposed changes based on limited waste composition data and observations, a reduction in landfill methane emissions is not supported by recent research on landfill methane emissions. In fact, a growing body of work has found actual measured landfill methane emissions to be significantly greater than those currently reported in inventories based on models, including the GHGRP.

As a result, we ask the EPA to validate the emissions model against recent measured data of landfill emissions and to propose the appropriate changes to landfill gas collection efficiency and/or soil oxidation to ensure the emissions modeling will better agree with published peer reviewed data on landfill methane emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0233-A1, Excerpt 1.

Commenter Name: Markus Videnieks
Commenter Affiliation: Circular Economy Coalition (CEC)
Commenter Type: Other
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0208-A1
Comment Excerpt Number: 1

Comment Excerpt: In contrast to the accurate quantification used by our members' facilities, landfills model their emissions. The proposed changes include altering the default values applied for degradable organic carbon ("DOC") content of municipal solid waste (MSW) managed at landfills, as well as the default values for decay rate (k-values). These changes, as acknowledged by the EPA, will reduce the reported emissions from landfills, but the changes will not result in more accurate estimates of landfill emissions as stated by the EPA. While the EPA presents arguments and data supporting the proposed changes based on limited waste composition data and observations, a reduction in landfill methane emissions is not supported by recent research on landfill methane emissions. In fact, a growing body of work has found actual measured landfill methane emissions to be significantly greater than those currently reported in inventories based on models, including the GHGRP.

As a result, we ask the EPA to validate the emissions model against measured data of landfill emissions and to propose the appropriate changes to landfill gas collection efficiency and/or soil oxidation to ensure the emissions modeling will better agree with published peer reviewed data on landfill methane emissions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0233-A1, Excerpt 1.

Commenter Name: Dar Baas
Commenter Affiliation: Kent County Department of Public Works, Michigan
Commenter Type: State Government/Regulatory Agency
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0240-A1
Comment Excerpt Number: 1

Comment Excerpt: The EPA should be continuously reevaluating aspects of the Greenhouse Gas Reporting Program to improve the accuracy of GHG emissions data. However, we are deeply concerned that the latest proposed changes include altering the default values applied for degradable organic carbon content of municipal solid waste managed at landfills, as well as the default values for decay rate. These changes will reduce the reported emissions from landfills, but the changes will not result in more accurate estimates of landfill emissions as stated by the EPA.

A number of recent studies have found that landfill methane emissions are significantly greater than those currently reported in the Greenhouse Gas Reporting Program. The EPA should either

require landfills to measure their actual emission with technology that currently exists, or they should model landfill emissions based on recent measured data. In the United Nations Environment Programme recent Global Methane Assessment it concluded, that mitigating methane emissions is the 'strongest lever' we have for avoiding the most severe impacts of climate change. The proposed changes to the Greenhouse Gas Reporting Program will reduce reported emissions from landfilling just as new research is showing landfill methane emissions are actually higher.

Response: See response to comment EPA-HQ-OAR-2019-0424-0233-A1, Excerpt 1.

Commenter Name: Michael E. Van Brunt
Commenter Affiliation: Covanta Energy, LLC
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0308-A1
Comment Excerpt Number: 1

Comment Excerpt: While WTE facilities utilize direct measurement to quantify their emissions, landfills utilize models. The EPA is proposing changes to the default values for degradable organic carbon ("DOC") content in municipal solid waste managed at landfills, as well as the default values for decay rate (k-values) from the 2022 Data Quality Improvements Proposal. As the EPA acknowledges, changing the DOC/k-value defaults to the proposed values will reduce the cumulative emissions reported by landfills over their reporting lifetime. This resultant impact will not only decrease the accuracy of emissions reported from landfills but would starkly contrast research showing that actual measured emissions from landfills are higher than those reported. [1]

Part of the justification for the proposed changes to the DOC/k-value defaults provided in the 2022 Revisions for Data Elements Under the GHG Reporting Rule proposal was the need to account for increased inert materials in the waste stream; however, most landfill operators already consider that by selecting modeling options that separate out inert waste. The Bulk Waste option is the only option under the Greenhouse Gas Reporting Program (GHGRP) which does not already separate out inert waste, and only a small minority of landfill operators utilize this model.[2] We find the proposed changes to the DOC/k-value defaults unnecessary. In its effort to improve landfill modeling accuracy, we believe the EPA should reconsider the current collection efficiency defaults to help bring modeled emissions into better alignment with actual measurements of landfill GHG emissions

Footnotes

[1] Amini, H.R., D. Reinhart, A. Niskanen (2013) Comparison of first order-decay modeled and actual field measured municipal solid waste landfill methane data, Waste Management 33: 12 (December 2013), 2720 – 2728.

[2] USEPA, Greenhouse Gas Customized Search, Query https://enviro.epa.gov/query-builder/ghgBuilder (epa.gov)

Response: EPA disagrees that the only improvements needed in subpart HH is related to gas collection efficiencies or that the proposed improvements are an either/or scenario. We are finalizing minor revisions in DOC values for the bulk waste and bulk MSW methods and making significant revisions to the DOC value for uncharacterized waste for facilities using the waste composition method. We are also revising the k-values for all wastes to improve the methane generation estimates when using the first order decay model. We are finalizing revisions to lower default gas collection efficiencies for all landfills based on comments received from the 2023 Supplemental Proposal and review of recent landfill methane emission measurement studies cited by commenters for landfills with gas collection systems as described in section III.T of the preamble of the final rule.

Commenter Name: Susan Glickman
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0309
Comment Excerpt Number: 1

Comment Excerpt: Due to the significant role that landfills play in overall methane emissions in the US, there is an imperative to ensure that GHG emissions reporting for landfills is as accurate as possible. Despite this need, the 2023 proposed changes to the EPA's Greenhouse Gas Reporting Program (GHGRP) alters default values proposed in 2022 for degradable organic carbon (DOC) content of waste and decay rate (k-values). This will result in reduced reported emissions from landfills compared to actual measurements. These changes in the reporting program contradict the growing body of work which has found that actual measured landfill methane emissions are significantly greater than those estimations reported in inventories based on current models.

Response: The EPA appreciates the commenter's input. The EPA has proposed to update the factors used in modeling CH_4 generation from waste disposed at landfills to reflect the increased amount of inert materials that are disposed at landfills and do not contribute to CH_4 generation. As noted in section III.T.2 of the preamble to the final rule, while we are decreasing the DOC value from 0.20 to 0.17 based on our analysis and changes in the composition of MSW disposed of in landfills, we are retaining the DOC of 0.20 for all wastes disposed of prior to 2010. This clarification in the application of the revised DOC of 0.17 for more recent disposal years (2010 and later) significantly reduces the impact of the proposed revisions on the modelled emissions (from Equation HH–1). Implementing the proposed default values may reduce the cumulative emissions reported for a given landfill over all reporting years. It may, however, increase the emissions reported during the years the landfill is actively receiving waste.

We note that updating the DOC and k default values may not always result in lower estimations of methane from landfills, as waste composition is only one component in estimating emissions, particularly for landfills with gas collection systems. EPA is continuing to improve the emission calculation estimates in subpart HH, and where possible incorporate direct-measurement data. Note, in the 2023 Supplemental Proposal, we also sought comment for examples of methane data

collected from available monitoring methodologies and how such data might be incorporated into subpart HH for estimating annual emissions. We are reviewing comments on these modifications along with comments received on other methane monitoring technologies and how such data may be incorporated into future subpart HH reporting.

Commenter Name: Morton Barlaz
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0286-A1
Comment Excerpt Number: 5

Comment Excerpt: DOC

June 18, 2019, memo from Jeff Coburn at RTI to Rachel Schmeltz at EPA

1. The analysis should be updated with the most recent data published in the Facts and Figures report (2018). I think that waste characterization studies are a more accurate way to get an estimate of the DOC of MSW disposed in landfills. As such, I am more comfortable with the DOC of bulk MSW as given in the most recent update from EREF (2020). As noted below, EREF and EPA agree for bulk MSW, so this argument is not important at this time.

2. As used in Table 1 and in the memo, "inerts" apparently means plastic, glass, metals, soil and other non-biodegradable components of MSW as categorized in the Facts and Figures report. I am not sure why leather and rubber are not classified as inerts as they are not anaerobically biodegradable. More important and to the point, no landfill operator will have information on the fraction of the MSW that they receive that is inert as defined in Table 1. As such, the use of this number is flawed. When I think of inerts entering landfills, I think about other non-hazardous industrial waste streams such as, for example, contaminated soil and auto shredder residue (ASR). I think that the modified bulk MSW option should mean bulk MSW (including plastics, glass, metal, etc.). Wastes that make little to no methane (C&D, ASR) should be excluded.

3. EPA recommends a DOC of 0.17 for bulk MSW including inerts. This is nearly identical to the value that EREF derived from a different set of data. Since the mass of bulk MSW disposed is what is known to landfill operators, I support the use of 0.17 for bulk MSW. I do not see much value in the term for Bulk MSW minus inerts since I have never seen waste receipts at a landfill tracked in this manner.

4. With respect to the appropriate DOC for C&D waste, there is a fundamental flaw in the DOC approach in that it treats the DOC of wood, food waste and paper to be the same. The anaerobic biodegradability of wood that is not pressure treated is generally quite low (Wang et al., 2011) and should not be equated with the COD of paper.

References

Wang, X., Padgett, J. M., De la Cruz, F. B. and M. A. Barlaz, 2011, "Wood Biodegradation in Laboratory-Scale Landfills," Environ. Sci. and Tech., 45, 16, p. 6864 - 71.

Response: With respect to items 1 through 3, see section III.T.2 of the preamble to the final rule. Regarding item 4, we only considered wood waste in our analysis of DOC for C&D waste; we did not consider food or paper waste when developing the DOC for C&D waste. We found that 31 percent of C&D waste is wood waste, but we also noted that only 19 percent of C&D waste (on mass weighted average) is degradable. Thus, we effectively assumed that 40 percent of wood waste was pressure treated or otherwise not degradable. While the DOC for wood waste is high (assumed to be 0.43), the fact that it degrades slowly is accounted for by a low k value, not by further reducing the DOC value. We did not revise the default DOC value for C&D waste based on this comment.

Commenter Name: Morton Barlaz
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0286-A1
Comment Excerpt Number: 6

Comment Excerpt: k Value:

Multivariate analysis of data reported to the EPA's Greenhouse Gas reporting Program June 11, 2019, memo from Meaghan McGrath, Kate Bronstein and Jeff Coburn at RTI to Rachel Schmeltz at EPA

1. Page 1: In the Modified Bulk MSW option, the term "effectively organic MSW" is used. If we are working with paper, food waste and yard waste, then the term that is in common use in the solid waste literature is "organic fraction of MSW or OFMSW." MSW that excludes inert and C&D waste will still include glass, metal, and plastics (which are organic).

2. Equation HH–1 used DOC which is really equivalent to DOC*DOCf in HH-1. EPA should correct this so its terms are consistent with the IPCC methodology.

3. Equation HH–7 MG is the methane that is not oxidized. However, all estimates of % oxidation (OX) are based on the fraction of the uncollected methane and not based on total methane generation. Here the oxidation factor is being applied to total methane generation which is incorrect. For purposes of the multivariate analysis described in this memo, this does not matter because in the equation for SSE at the top of page 4, the OX term is removed. Nonetheless, the terminology could be improved.

4. Page 4: “The variables DOC and k were adjusted using a statistical software”
   The k and DOC values derived from the multivariate analysis described here lump factors that impact methane generation but are not modelled into k and DOC (*e.g.*, moisture content, temperature, waste mix, and anything else that impacts methane generation). In addition, just because the SSE is minimized does not make k and DOC the correct values, it just means they give the best model fit to the available data. Based on this analysis, one cannot necessarily extend this data to waste disposal in the future.

   The method adopted here to minimize the sum of squared errors (SSE) relies on the three uncertain factors (modeled methane generation, an estimated collection efficiency, and an assumed oxidation factor). There is an alternate approach to estimating k that does not require any information on modeled generation or methane oxidation, but only relies on an estimated collection efficiency. The alternate approach is presented in a series of 2 papers (Wang et al., 2013 and 2015). The data set in these papers is smaller but I would argue that the results are more generally applicable because they optimize k based on measured gas recovery with having to model methane generation or assume methane oxidation.

5. The text states explains that a “seed” value is necessary to start the process to minimize the SSE. Was work conducted to check the results based on starting with alternate seed values? Do the optimized values for k and DOC represent local or global optima?

6. Page 7: the term “actual gas generation” is used. However, it is not actual gas generation since HH-7 still requires an estimate of collection efficiency.

7. Figure 2: If this plot was as a ratio, it would easier to interpret. Alternately, the observed and estimated values could be plotted against each other.

8. Table 3: The range of the optimized DOC is totally unrealistic even though the averages are reasonable. What does the wide range tell us about the overall use of the method?

9. Page 10: The memo indicates that the derived values closely align with IPCC. True, I wish they would have cited Wang et al. (2013) which reached the same conclusion for US landfills. Overall, I am marginally comfortable with the decay rate constants used for moderate and wet areas. However, the step changes in decay between 20 and 40” are not ideal. A landfill that receives 35” of rain a year is a lot more similar to a landfill that receives 41” than a landfill that receives 19”, yet the decay rate would be the value for a moderate climate. Similarly, a landfill that receives 21” of rain a year is more similar to a landfill that receives 19” of rain than a landfill that receives 35” a year. One way to solve this would be to take the defaults for each climate range and make a linear function between 1” and 41” of rain a year. The advantage to this is that it eliminates the step function issue. The disadvantage is that it implies more precision than is warranted. Finally, when I talk to people about arid landfills, the near uniform comments are along the lines of “we cannot recover gas.” I am thus suspect of the 0.055 yr-1 decay rate constant and fear that it will lead to substantial overestimates in

gas generation. This is a good example of a case where the 0.055 is based on minimizing the SSE for a dataset but that does not mean it should be applied to new landfills and future years outside the data set. Finally, the EPA proposes values to 3 significant figures which is excessive given the uncertainty in this work.

References

Wang, X., Nagpure, A. S., DeCarolis, J. F. and M. A. Barlaz, 2013, "Using Observed Data to Improve Estimated Methane Collection from Select U.S. Landfills," Environ. Sci. and Technol., 47, 7, p. 3251 - 7.

Wang, X., Nagpure, A. S., DeCarolis, J. F. and M. A. Barlaz, 2015, "Characterization of Uncertainty in Estimation of Methane Collection from Select U.S. Landfills," Environ. Sci. and Technol., 49, 3, 1545 - 51.

Response: With respect to item 1, we maintain that, based on how the modified bulk MSW method was developed and anticipated to be used, the higher default DOC for bulk MSW (excluding inerts and C&D waste) is appropriate. See also section III.T.2 of the preamble to the final rule.

Regarding item 2, the multi-variant analysis used Equation HH–1, which includes additional terms (MCF, DOC_F, and F). We used the default value of 0.5 for DOC_F. The DOC values we determined and reported are specifically for DOC, not DOC × DOC_F as asserted by the commenter.

Regarding item 3, the commenter is correct that Equation HH–7 MG is the methane that is not oxidized, which is why the (1-OX) term was used to correct Equation HH–7 when comparing the results from Equation HH–1. The equations and terminology used is consistent with the subpart HH rule.

Regarding item 4, our approach appears to be consistent with the approach used by Wang, et al., in which recovery data with estimated collection efficiencies are used to estimate methane generation. As noted under item 3, the approach we used is not dependent on oxidation fraction assumed. Wang, et al., (2013) concluded that k values were generally understated and that k values estimated for 11 landfills studied ranges from 0.09 to 0.12 per year, which is reasonably consistent with our results for landfills in wet climates.

Regarding item 5, yes, the optimization routine required an initial input value. We did conduct some analysis to ensure that the optimized values were not dependent on the initial values; however, there were cases where the results could vary depending on the seed values. Nonetheless, the seed values used were the current default DOC and k values used in subpart HH. In this manner, if there were local optimums, we would have identified optimal values close to the values already used in subpart HH.

Regarding item 6, the commenter is correct that the "actual gas generation" still requires an estimate of collection efficiency, but this terminology was used because this value was assumed to be the most representative or "true" value for the methane generation quantity.

Regarding item 7, we appreciate the comment but are not revising this memorandum for this comment at this time.

Regarding item 8, we do not consider the range of the optimized DOC to be unrealistic, except for the highest value for the uncharacterized waste. For bulk waste, the highest optimized DOC value is below the default DOC for wood waste. Nonetheless, the wide range in DOC values indicates that there is significant uncertainty in using the bulk waste method (single default DOC value) for all landfills.

Regarding item 9, we agree that the revised k values more closely align with IPCC values and the values determined by Wang et al. (2013). The k values we are finalizing are lower than those proposed (see section III.T.2 of the preamble to the final rule) and provided to two significant digits. We expect that the final k value for dry climates of 0.033 per year addresses the commenter's concern regarding landfills in arid areas. With respect to the step changes in decay between 20 and 40" we agree that landfills with rainfall amounts near the transition (one above and one below) will be more similar to each other than for another landfill at the other end of the range, but within the same classification. We considered developing a linear regression as suggested by the commenter rather than providing the default values by range. We did not have specific data on rainfall by landfill, so we could only plot the range's default k value with the midpoint of the range. Since the driest areas in the U.S. have rainfalls of about 4", we used 12" as the midpoint for the dry k value. We used 30" and 50" for the representative rainfalls for moderate and wet areas. The three data points appear to be well correlated using a linear regression. However, to apply the correlation, facilities would need to more closely track local rainfall totals and their leachate recirculation rates, if used. Currently, facilities using leachate recirculation can simply opt to use the wet climate k values. If a linear correlation is provided, what k value should these facilities use? Or would they need to explicitly determine their leachate recirculation rates? While we liked the idea of using the linear correlation, we had concerns on how to implement this change. We concluded that the ancillary impacts of this change could be significant and that it would be best to propose this change and allow for public comment and review. Therefore, we are not finalizing the use of a linear correlation at this time, but we intend to consider it further in future rulemakings.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 14

Comment Excerpt: The two RTI memos do not appear to comply with General Assessment Factors, especially factors (5) evaluation and review and (1) soundness.

The evaluation and review factor (5) "refers to the extent of independent verification, validation and peer review of the information." *General Assessment Factors*, at p. 8. Neither RTI memo

provides any mention nor certification of an independent peer review. According to EPA's Peer Review Policy, "peer review of all scientific and technical information that is intended to inform or support Agency decisions is encouraged and expected." EPA. *Peer Review and Peer Involvement at the U.S. Environmental Protection Agency*, (Jan. 2006). Furthermore, "any work product that is "important to EPA decision making" and "independently generated," such as these analyses conducted by RTI, "should be considered as [a] candidate for peer review." *Peer Review Handbook* at p. 42. The fact that these memos, which function as the technical basis for the DOC and k value changes, were not independently peer reviewed, undermines the quality and credibility of this scientific information.

Second, RTI's June 18, 2019 memo does not satisfy the (1) soundness factor in EPA's General Assessment Factors. Soundness is described by EPA as the "extent to which the scientific and technical procedures, measures, methods or models employed to generate the information are reasonable for, and consistent with, the intended application." General Assessment Factors, at p. 4; RTI's memo relies on the k values reported by other Annex I countries to determine the new k values for U.S. landfills. Although the other countries are claimed to have similar climates to the U.S., there are multiple significant differences between the U.S. and these countries which make reliance on their k values unreasonable, such as different laws, waste management practices, and the U.S.'s vast geography with varying climates. These differences are not discussed or accounted for in RTI's literature review. Furthermore, the other countries' k values rely on the IPCC 2006 model, which is an international model that is designed for a wide range of countries, not for specific U.S. landfill site conditions. The assumption that the 2006 IPCC model bulk waste k values yield more realistic estimates of landfill gas generation from U.S. landfills has not been justified by the EPA. Furthermore, EPA's proposed k value for moderate climates (0.111) is 2.2 times the IPCC value for temperate climates in this precipitation range (0.05), and their value for wet climates (0.142) is about 60% higher than IPCC's bulk MSW k value for wet temperate climates (0.09).

RTI developed the k values proposed by the EPA by performing a multivariate analysis to minimize the difference between the reported values from Equations HH–7 and HH–1. EPA's analysis optimized k and DOC simultaneously to adjust the results from HH–1 to more closely align with the "observed" HH-7. This approach is concerning as follows:

- The "observed" value of HH–7 is an estimate that is approximate and is not an "observation." Adjusting the k and DOC values to minimize the difference between HH–1 and HH–7 values will produce error to the extent that the HH–7 estimates do not reflect actual collection efficiency.
- Optimizing k and DOC values simultaneously can lead to extreme and unrealistic values because an error in one value causes an offsetting error in the other to yield the same LFG generation estimate. This error occurs in the RTI study because DOC and k values are not constrained to realistic values, but are allowed to vary across a 40-fold range, so that DOC and k pairs are unlikely to accurately reflect the waste composition and decay rates at many of the study sites. The extremely wide observed range of "optimized" k values (*e.g.*, 0.001 to 0.400 for dry climates) produce so much uncertainty in the estimated average value as to render it practically meaningless.

- The changes to estimated LFG generation from proposed new k and DOC values are 2.5 to 3 times higher than the existing values, and will produce large increases in LFG generation and emissions estimates for open sites. Because the k values are not supported by a valid, peer-reviewed study by a waste sector expert, they appear to be chosen not based on science but on the desired effect. EPA has indicated a belief that methane emissions from landfill have been underestimated based on aerial studies indicating higher methane emissions may be present. Putting aside for the moment questions of the accuracy, uncertainty, and limitations of quantifying methane emissions from landfills using remote sensing, the solution to a potential underestimation of landfill methane emissions is not assuring that LFG generation is overestimated in emissions models.

For these reasons, the method employed by RTI to generate the new U.S. k values is "not reasonable for and consistent with the intended application," of such information in U.S. landfills. General Assessment Factors at p. 4. The Landfill Industry Commenters provided comment on the proposed DOC and k values in the October 2022 comment letter attached hereto, and continue to disagree with certain of these proposed values set forth herein. In particular, we again request that the Agency reconsider the work done by the Environmental Research and Education Foundations ("EREF") with respect to DOC values. The Environmental Research & Education Foundation (2019), Analysis of Waste Streams Entering MSW Landfills: Estimating DOC Values & the Impact of Non-MSW Materials, (available at www.erefdn.org). In addition to those comments, we support and ask EPA to consider the review conducted by Morton Barlaz, as set forth in his comment to the Proposed Rule.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

See response to comment EPA-HQ-OAR-2019-0424-0319-A1, Excerpt 6 for discussion on the studies used to support the proposed revisions to subpart HH.

19.6 Revisions to reporting requirements to improve data quality (40 CFR 98.346)

Commenter Name: John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele
Commenter Affiliation: RMI
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0234-A1
Comment Excerpt Number: 6

Comment Excerpt: We strongly support EPA's proposal to require landfills with gas collection and control systems to indicate the percentage of recovered methane that is sent to a flare or sent to a landfill gas-to-energy project in order to inform future climate and renewable energy policies. This is an important effort that will allow EPA and the public to understand and better evaluate productive uses of landfill methane, as well as the negative implications of flaring.

For landfills with gas collection and control systems, EPA already gathers information about the total volume of gas collected and whether and where it is destroyed (flared). EPA's proposal to

additionally gather information about the proportion of landfill gas that is flared versus sent to a landfill gas to energy project adds minimal burden to operators. This information is important to (1) help inform future policies under the Clean Air Act by providing information on the amount of recovered methane that is beneficially used in energy recovery projects, (2) help verify net methane emissions from landfills with gas collection and control systems, and (3) inform EPA, state, and local government officials on progress towards renewable energy targets and greenhouse gas emission inventories.

We support these additions and also recommend that EPA collect information about the characteristics of flares being used. Recent studies and observations have shown that flares used in the oil and gas sector commonly malfunction or are even entirely unlit, leading to significant methane emissions.[49] Given the flow and potential intermittency of gas being supplied to the flares at landfills, we suspect malfunctioning and unlit flares are also likely a problem in this sector. There is also significant evidence that the destruction efficiencies of flares are lower than EPA generally assumes.[50]

Understanding whether operators are using open or enclosed flares, the manufacturer-specified destruction efficiency, and any discovered malfunctions and the duration of the malfunction is important for evaluating the effectiveness of flares, their emissions, and also for informing future regulations. Assumed destruction efficiencies used in reporting equations should align with regulatory standards and the most recent data on actual destruction efficiency. Flares at landfills are not required to achieve a 99% destruction efficiency and there is little evidence of flares operating this efficiently. Better information on where gas that is sent off-site for destruction is going, and whether it is being flared, is also important for improving reporting and emission estimates.

We therefore urge EPA to collect activity data on flares and other forms of combustion devices used at landfills. Specifically, EPA should require reporters to document and report for passive and active flares:

- A unique flare ID;
- Volume of gas routed to the flare (measured by a continuous flow measurement device);
- Type of flare (open ground level, enclosed ground level, etc.);
- Maximum and minimum flow values of the flare stack (turndown-ratio);
- Whether a flare assist is present, and if so, the type of assist;
- Ignition type;
- If and how reporter verifies that combustion is occurring; and
- Whether devices, such as temperature transmitters, are used alongside flow monitors to document the volume of emissions during periods where the flare is unlit.

Gathering information on these data elements will help EPA better understand landfill gas flaring, which can allow for future refinements to reporting calculations and inform regulatory approaches.

Footnotes

[49] Permian Methane Analysis Project, Flaring: Aerial Survey Results, https://www.permianmap.org/flaring-emissions/.

[50] Plant et al., Inefficient and unlit natural gas flares both emit large quantities of methane, 377 Science 6614 (2022), https://www.science.org/doi/10.1126/science.abq0385.

Response: The EPA acknowledges the commenter's support of the proposed revisions to subpart HH and the recommendations for additional reporting information for flares. We will review these recommendations and may consider them in a future rulemaking for subpart HH.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 80

Comment Excerpt: We strongly support EPA's proposal to require landfills with gas collection and control systems to indicate the percentage of recovered methane that is sent to a flare or sent to a landfill gas-to-energy project in order to inform future climate and renewable energy policies. This is an important effort that will allow EPA and the public to understand and better evaluate productive uses of landfill methane, as well as the negative implications of flaring. For landfills with gas collection and control systems, EPA already gathers information about the total volume of gas collected and whether and where it is destroyed (flared). EPA's proposal to gather additional information about the proportion of landfill gas that is flared versus sent to a landfill gas to energy project adds minimal burden to operators. This information is important to (1) help inform future policies under the Clean Air Act by providing information on the amount of recovered methane that is beneficially used in energy recovery projects, (2) help verify net methane emissions from landfills with gas collection and control systems, and (3) inform EPA, state, and local government officials on progress towards renewable energy targets and greenhouse gas emission inventories.

We support these additions and also recommend that EPA collect activity data and information about the characteristics of flares being used. Recent studies and observations have shown that flares used in the oil and gas sector commonly malfunction or are even entirely unlit, leading to significant methane emissions. [191] Given the flow and potential intermittency of gas being supplied to the flares at landfills, we suspect malfunctioning and unlit flares are also likely a problem in this sector. There is also significant evidence that the destruction efficiencies of flares are lower than EPA generally assumes.[192] Understanding whether operators are using open or enclosed flares, the manufacturer-specified destruction efficiency, and any discovered malfunctions and the duration of the malfunction is important for evaluating the effectiveness of flares, their emissions, and also for informing future regulations. Assumed destruction efficiencies used in reporting equations should align with regulatory standards and the most recent data on actual destruction efficiency. Flares at landfills are not required to achieve a 99%

destruction efficiency and there is little evidence of flares operating this efficiently. Better information on where gas that is sent offsite for destruction is going, and whether it is being flared, is also important for improving reporting and emission estimates. We therefore urge EPA to collect activity data on flares and other forms of combustion devices used at landfills. Specifically, EPA should require reporters to document and report for passive and active flares:

- A unique flare ID;
- Volume of gas routed to the flare (measured by a continuous flow measurement device);
- Type of flare (open ground level, enclosed ground level, etc.);
- Maximum and minimum flow values of the flare stack (turndown-ratio);
- Whether a flare assist is present, and if so, the type of assist;
- Ignition type;
- If and how a reporter verifies that combustion is occurring; and
- Whether devices, such as temperature transmitters, are used alongside flow monitors to document the volume of emissions during periods where the flare is unlit.

Gathering information on these data elements will help EPA better understand landfill gas flaring, which can allow for future refinements to reporting calculations and inform regulatory approaches. To align with regulatory standards and actual measurements of flare efficiency, EPA should lower the destruction efficiency assumption in equation HH–6 from 99% to 95%. Until in-situ measurements of landfill flares are conducted to better estimate emissions and destruction efficiency, EPA should base reporting on conservative estimates that it relies on in regulations and that are supported by recent scientific evidence.[193] Similarly, if gas is being sent off-site for destruction, EPA should require reporting on whether that gas is being flared, and if so, equation HH–6 should require use of 95% destruction efficiency too, not 100%. Unifying flare reporting requirements across subparts and with regulatory standards will create more consistent estimates and allow for insights from one source category to improve performance and regulations in another. The addition of elements requiring flow measurement devices and documenting periods of unlit flares will also add some empirical verification to flare reporting, leading to more accurate reporting.

Footnotes

[191] Permian Methane Analysis Project, Flaring: Aerial Survey Results, https://www.permianmap.org/flaringemissions/.

[192] Plant et al., Inefficient and unlit natural gas flares both emit large quantities of methane, 377 Science 6614 (2022), https://www.science.org/doi/10.1126/science.abg0385.

[193] Id.: see also 40 C.F.R. § 60.18.

Response: See response to comment EPA-HQ-OAR-2019-0424-0234-A1, Excerpt 6.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)

Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 10

Comment Excerpt: EIP supports EPA's proposal to add a reporting requirement that will help EPA to assess the amount of landfill gas that is flared versus gas sent to a "landfill gas to energy" project. Specifically, the Agency proposes to require operators of landfills with GCCS "to indicate the percentage of recovered CH_4 that is flared or sent to a landfill gas to energy project for each measurement location." EPA further explains that "[t]his information would help inform the development of GHG policies and programs under the CAA by providing information on the amount of recovered CH_4 that is beneficially used in energy recovery projects and will assist in verification of net CH_4 emissions from landfills with [GCCS]." We support the collection of additional data, including data on flaring and energy generation, that will help to inform policy development.

Response: See response to comment EPA-HQ-OAR-2019-0424-0234-A1, Excerpt 6.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 27

Comment Excerpt: CATF supports and commends EPA on their plan to introduce additional reporting requirements for landfills with gas capture operations. Differentiating between the percentage of methane disposed of through flaring and the percentage of methane delivered to landfill gas-to-energy projects is an important step towards increasing the transparency and understanding of methane mitigation methods from the U.S. waste sector and will improve reporting towards renewable energy targets.

Response: See response to comment EPA-HQ-OAR-2019-0424-0234-A1, Excerpt 6.

Commenter Name: Darrell K. Smith and David Biderman
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0237-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA is also proposing "to require MSW landfills to report data on the landfill CH_4 emissions that are destroyed versus sent to landfill gas energy projects." Further, we understand that this will be done by reporting the relative percentage of gas sent to energy projects versus being, "destroyed." With the availability of data collected by the Landfill Methane Outreach Program (LMOP), we see this request as not only duplicative, but capable of providing data with less reliability than data already collected by the EPA. Further, we are uncertain of the definition of "landfill gas to energy projects," as there are multiple beneficial use projects that destroy landfill gas to produce power as well as other beneficial uses (transportation fuels, leachate evaporation, boilers, etc.). We recommend that rather than requiring new reporting requirements that EPA instead rely on LMOP data.

Response: First, we note that LMOP is a voluntary program and, therefore, we cannot rely solely on that dataset. Second, we note that EPA revised the reporting requirements related to capture systems and destruction devices in the 2023 Supplemental Proposal. We are requiring time of operation of each control system, by which we can estimate the relative volume of gas flared versus sent to landfill-gas-to-energy projects.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA should require landfill operators whose site includes a GCCS to report whether that collection system is regulated. Our analysis of Maryland landfills showed that (1) landfills not subject to regulatory performance requirements outnumber those subject to such requirements by a wide margin; and (2) landfills subject to performance requirements report significantly higher collection efficiencies on average.

For EIP's 2021 data report on landfill emissions in Maryland, we analyzed collection efficiencies reported by landfill operators to the Maryland Department of the Environment ("MDE"), which were used in Maryland's Greenhouse Gas Inventory.[17] For the 2017 dataset, of Maryland's 21 landfills with a GCCS, 17 were voluntarily installed and 4 were required under federal regulations.[18] Of the 17 unregulated systems, EIP found data on system efficiency for 16. The gas collection systems at these 16 landfills had a reported collection efficiency of 55%, which is significantly lower than the 76% average efficiency achieved by the four systems subject to federal requirements.[19] The difference was even more pronounced when considering only active landfills (those still accepting waste). For active landfills, the operators reported an average 69% efficiency at the 3 landfills that were subject to federal regulations, while operators of the 10 active landfills that installed the systems voluntarily reported an average 39% efficiency. For all 21 landfills with GCCS averaged together, the collection system efficiency reported was 59%.

Maryland's 2020 dataset, which is now available, also indicates the same trend, showing a 20-percent efficiency difference between unregulated and regulated systems. That year, the average collection efficiency of the four regulated systems was 74% and the average for the 16 systems not subject to regulation was 54%. EIP was not able to compare efficiencies from active systems only due to uncertainty about the active or closed status of certain landfills. The average reported system efficiency for all landfills in 2020 was again 59%. It stands to reason that gas control systems that are subject to regulatory requirements governing their operation would function more efficiently than those that are not. However, the stringency of requirements governing GCCS performance now differs in three states — California, Oregon, and Washington — all of which have established standards that are stronger than federal requirements.

Landfills may be subject to multiple requirements relating to GCCS performance under applicable regulations. One particularly salient example is surface methane monitoring. Under EPA's Emission Guidelines and California and Oregon's landfill regulations, a GCCS must be operated so that surface concentrations of methane are no higher than 500 ppm above background levels, based on a single measurement at a single point in time.[20] However, California and Oregon's rules also include a second, lower limit of 25 ppm, which is based on several readings taken in a section of the landfill and then averaged together for a composite.[21]

It will not burden landfill operators to report whether a landfill GCCS is subject to regulations governing performance (yes or no) and, if so, to cite the applicable regulations. Landfill operators must already determine whether compliance with these regulations is required.

Given the apparent increase in unregulated GCCS at landfills and the lower system efficiencies reported for these sites, EPA should require landfill operators to report whether the GCCS is subject to regulations governing its performance, and, if so, to cite those regulations.

Footnotes

[17] Maryland's Greenhouse Gas Inventory is available at https://mde.maryland.gov/programs/air/ClimateChange/Pages/GreenhouseGasInventory.aspx

[18] The Maryland landfill operators were not using EPA's GHGRP methods to estimate collection efficiency.

[19] The 4 Maryland landfills that do have federally regulated collection systems and their reported collection efficiencies in 2017 are: (1) Eastern Landfill in Baltimore County; (2) Millersville Landfill in Anne Arundel County, (3) Brown Station Road Landfill in Prince George's County; and (4) the closed Sandy Hill Landfill in Prince George's County.

[20] 40 C.F.R. § 60.34f(d); 17 C.C.R. § 95465(a)(1).

[21] 117 C.C.R. § 95465(a)(2) (California); OAR 340-239-0200 (Oregon).

Response: The EPA acknowledges the comment and we are finalizing the reporting requirements for landfills with gas collection systems to indicate the applicability of federal rules or state and federal implementation plans.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)

Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 12

Comment Excerpt: In order to ensure that oxidizing material is actually used, EPA should require that landfill operators report the type of material being used for cover. We are aware that, at least in the context of the daily cover requirements set forth at 40 C.F.R. § 258.21, landfill operators sometimes seek and receive approval to use materials like incinerator ash rather than clean soil as cover.[23]

[Commenter submitted two attachments for reference: Covanta DELCORA Wastewater Permit Renewal Application (April 3, 2018) and Letter from Hilary Miller, Director, Land & Materials Administration, Maryland Department of the Environment ("MDE"), to Rudolf S. Chow, Director, Baltimore City Department of Public Works ("DPW") (March 18, 2018) (MDE response to Baltimore City DPW's proposed standard operating procedure for use of incinerator ash for daily cover at the Quarantine Road Landfill in Baltimore City). See DCN EPA-HQ-OAR-2019-0424-0226-A1 for attachments.]

Since EPA's oxidation fractions reference final, intermediate, and interim cover, EPA should require reporting of the material used for each type of cover. If EPA revises these definitions, any cover type that is addressed in the revised definitions should have a corresponding reporting requirement.

Footnotes

[23] Excerpt from Covanta DELCORA Wastewater Permit Renewal Application, April 3, 2018, page 6 of 10 (identifying disposal method of bottom and fly ash from incinerator as daily landfill cover) (Attachment A); Letter from Hilary Miller, Director, Land & Materials Administration, Maryland Department of the Environment ("MDE"), to Rudolf S. Chow, Director, Baltimore City Department of Public Works ("DPW") (March 18, 2018) (MDE response to Baltimore City DPW's proposed standard operating procedure for use of incinerator ash for daily cover at the Quarantine Road Landfill in Baltimore City) (Attachment B).

Response: The EPA did not propose to revise the oxidation fractions for subpart HH and thus this comment is out of scope for this rulemaking.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 11

Comment Excerpt: EIP supports the recommendation of RMI and EDF that EPA should require landfill operators to complete periodic waste characterization studies and report the data. The amount and type of organics disposed of is critically important information. In addition,

organics diversion must be among the set of policy and program options that EPA reviews as it considers best practices for reducing greenhouse gases from landfills. In 2013, EPA estimated that composting and anaerobic diversion practices each achieve a 95% methane reduction efficiency when compared to landfilling organic waste.[37] Site-specific information will improve EPA's ability to evaluate how best to approach organics diversion policy.

Footnotes

[37] EPA, Global Mitigation of Non-CO_2 GHGs Report: 2010-2030 (2013), Landfills, p. III-6, at https://www.epa.gov/sites/default/files/2016-06/documents/mac_report_2013-iii_waste.pdf (entire report available at https://www.epa.gov/global-mitigation-non-co2-greenhouse-gases/global-mitigation-non-co2-ghgs-report-2010-2030).

Response: The EPA did not propose to require periodic waste characterizations for subpart HH reporters. As such, this comment is out of scope for this rulemaking.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA should revise subpart HH to require landfill operators to report emissions of nitrous oxide and carbon dioxide from landfills and not merely combustion sources at the landfill. Currently, EPA requires landfill operators to report only methane emissions from the landfill itself. For carbon dioxide and nitrous oxide, emissions must be reported only from combustion sources at the landfill. This is problematic because carbon dioxide and nitrous oxide are greenhouse gases that are known to be emitted from decomposition of waste in landfills. The failure to account for these gases is particularly troubling in the case of nitrous oxide, which has a warming potential even more powerful than methane.

It is well known that a large portion of landfill gas is made up of carbon dioxide. According to information from federal U.S. agencies, this amount is typically considered to be between 40-60% of landfill gas.[27]

Nitrous oxide is a gas with a global warming potential 298 times greater than carbon dioxide.[28] The IPCC states that "[s]ignificant generation of [nitrous oxide] from [Solid Waste Disposal Sites, which include landfills] was indicated by the IPCC Fourth Assessment Report (2007)" and the anaerobic generation of nitrous oxide is "common" in landfills.[29] EPA has also acknowledged that MSW landfills emit nitrous oxide.[30] California tracks nitrous oxide emissions from MSW landfills in its state greenhouse gas inventory.[31] Further, a number of studies show that nitrous oxide is generated and emitted by MSW landfills, including from the active faces of landfills.[32] Thus, EPA should account for it in the GHGRP.

Footnotes

[27] See, *e.g.*, EPA, Landfill Gas Basics, https://www.epa.gov/lmop/basic-information-about-landfill-gas ("Landfill gas ...is composed of roughly ... 50 percent carbon dioxide."); Agency for Toxic Substances & Disease Registry, Landfill Gas Primer — An Overview for Environmental Health Professionals, Chapter 2: Landfill Gas Basics, https://www.atsdr.cdc.gov/HAC/landfill/html/ch2.html#: ~:text=By %20volume%2C%20landfill 220¢as%20typically.%2C%20benzene%2C%20and%20vinyl%20chloride ("By volume, landfill gas typically contains 45% to 60% methane and 40% to 60% carbon dioxide.")

[28] EPA, Overview of Greenhouse Gases, Nitrous Oxide, https://www.epa.gov/ghgemissions/overview-greenhouse-gases#nitrous-oxide.

[29] IPCC, 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5, Chpt. 3, at 23, Appendix 3A.1 Information on Nitrous Oxide Emission from Solid Waste Disposal Sites, https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/5_Volume5/19R_V5_3_Ch03_SWDS.pdf.

[30] See, *e.g.*, EPA, Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Municipal Solid Waste Landfills, at 21, 26 (June 2011), available at https://www.epa.gov/sites/default/files/2015-12/documents/landfills.pdf.

[31] See California Air Resources Board, Current California GHG Emission Inventory Data (July 28, 2021), available at https://ww2.arb.ca.gov/ghg-inventory-data.

[32] See, *e.g.*, Jean Bogner, et al., Seasonal greenhouse gas emissions (methane, carbon dioxide, nitrous oxide) from engineered landfills: Daily, intermediate, and final California soil covers, Journal of Environmental Quality, at 1010—20 (2011); Houhu Zhang, et al., N_2O emissions at municipal solid waste landfill sites: Effects of CH_4 emissions and cover soil, Atmospheric Environment, at 2623-31 (May 2009), available at https://www.researchgate.net/publication/223658901_N2O_emissions_at_municipal_solid_waste_landfill_sites_Effects_of_CH4_emissions_and_cover_soil.

Response: The EPA did not include reporting of CO_2 emissions from landfills in the original rule because these emissions were considered biogenic. EPA did not propose to revise subpart HH to add requirements for the reporting of additional GHGs under this subpart. As such, this comment is out of scope for this proposed rulemaking.

Commenter Name: Not provided
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0305-A1
Comment Excerpt Number: 1

Comment Excerpt: EIP supports EPA adding reporting requirements for landfills with a GCCS to indicate the applicability of Federal rules or state and Federal implementation plans that require quarterly surface monitoring, an indication of whether surface methane concentration monitoring is conducted, the frequency of monitoring, and the information for each instance surface methane concentrations exceeded 500 parts per million above background, including re-monitoring exceedances.[13] EIP further supports EPA's stated reasoning for these additional

reporting elements "to better understand the applicability of the [New Source Performance Standards, ("NSPS")] (40 CFR part 60, subpart WWW or XXX), state plans implementing the [Emission Guidelines ("EG")] (40 CFR part 60, subparts Cc or Cf), and Federal plans (40 CFR part 62, subparts GGG or OOO), and to support verification of the reported emissions given the additional term added to equations HH–6, HH–7, and HH–8 and the different gas collection efficiency values."[14] We reiterate that it is critically important for regulators, landfill operators, and the general public to be able to understand the effect of regulatory drivers on emission reductions and control system performance at landfills. EPA's proposed change is a necessary step for stakeholders to develop that understanding.

Footnotes

[13] 88 Fed. Reg. 32852, 32879 (May 22, 2023).

[14] Id. at 32879.

Response: The EPA acknowledges the commenter's support for our proposal to add reporting requirements for landfills with a GCCS to indicate the applicability of Federal rules or state and Federal implementation plans that require quarterly surface monitoring. We are finalizing this reporting requirement in the final rule. We are not finalizing the inclusion of the additional reporting elements to equations HH–6, HH–7, and HH–8 regarding surface emissions monitoring at this time, as explained in section III.T of the preamble of the final rule. We will continue to review available literature and may consider these comments for a future rulemaking.

Commenter Name: Not provided
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0305-A1
Comment Excerpt Number: 3

Comment Excerpt: Unless EPA can explain the reason for departing from the wellhead monitoring and temperature reporting parameters that the Agency has already identified as indicative of poor performance under sections 111 and 112 of the Clean Air Act ("CAA"), EPA should use the same parameters in its GHGRP rules. The Clean Air Act regulations require wellhead monitoring on a monthly basis and the primary parameters measured are gage pressure, temperature, oxygen, and nitrogen.[32]

EPA should require reporting of whether negative gage pressure is maintained at wellheads. If negative pressure is lost, this should be treated at an indicator of poor performance.

For temperature, EPA should require reporting of all temperatures above 131 degrees Fahrenheit and should treat this as the temperature threshold for determining poor system performance. In EPA's 1996 NSPS, a 131-degree Fahrenheit temperature threshold was established for corrective action.[33] At a minimum, readings above (around 135 degrees Fahrenheit) this temperature threshold indicate that a subsurface event is occurring or is likely to occur. As noted by the Solid Waste Association of North America ("SWANA") manual of practice for landfill GCCS:

polyvinyl chloride piping begins to fail at 145 °F and fails at 165 °F, temperatures above 140 °F could indicate aerobic conditions [meaning the presence of oxygen, posing a fire risk], and landfill gas temperature over 135 °F indicates a possible subsurface oxidation event (SOE)[rapid and self-sustaining combustion of organic waste that is exposed to oxygen (aerobic conditions)].[34.]

EPA should also require reporting of wellhead oxygen and/or nitrogen measurements, which can indicate air intrusion. EPA's 1996 NSPS required corrective action for an exceedance of 5% oxygen or 20% nitrogen.[35] Those thresholds were removed during subsequent revisions but monitoring of oxygen or nitrogen is still required.[36] For these parameters, EPA should require establishment of a baseline and then treat it as an indicator of poor performance if reported values deviate significantly from that baseline.

Lastly, EPA should require monitoring and reporting on wellhead flooding as an indicator of poor collection system performance. Gas collection wells cannot capture gas if the well becomes flooded with leachate or condensate.[37] Indicators of a flooded well include a high vacuum pressure with low gas flow, a drop in header system pressure between wells,[38] and the ratio of carbon dioxide to methane.[39] For these parameters, EPA should establish that a flooded well or certain number of flooded wells constitutes poor performance.

Footnotes

[32] See, *e.g.*, 40 C.F.R. § 60.766(a).

[33] Air Emissions from Municipal Solid Waste Landfills-Background Information for Final Standards and Guidelines 1-8, 1-41, 1-42 (December 1995) https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=2000IN3H.pdf at 1-42 [hereinafter "EPA 1995 Background"].

[34] National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills Residual Risk and Technology Review, 84 Fed. Reg. at 36691 (citing SWANA/National Renewable Energy Laboratory (NREL), Landfill Gas Operation and Maintenance Manual of Practice 9-8 (1997), https://www.nrel.gov/docs/legosti/fy97/23070.pdf) (emphasis added).

[35] EPA 1995 Background, supra note 33, at 1-42.

[36] 40 CFR § 60.766(a)(2).

[37] 79 Fed. Reg. 41796, 41803.

[38] EPA, Landfill Gas Energy Project Development Handbook: Landfill Gas Contracts and Regulations 5 (July 2021), https://www.epa.gov/system/files/documents/2021-07/pdh_chapter5.pdf.

[39] See Loci Controls System Performance Assessment at 25, https://22041406.fs1.hubspotusercontent-na1.net/hubfs/22041406/PDFs/PTP%20Informatics-LoCI_ThirdPartyPeerReview.pdf.

Response: The EPA did not propose to request the information noted by the commenter. As such, this comment is out of scope for this rulemaking.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI

Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 1

Comment Excerpt: Landfill operators subject to the New Source Performance Standards or Emission Guidelines (NSPS/EG) control requirements are already required to monitor monthly wellhead pressure, temperature, and nitrogen/oxygen levels. The current NSPS/EG define wellhead exceedances as a measurement of positive pressure or landfill gas temperature of 55 degrees Celsius or above, and we recommend EPA adopt these same parameters as indicators of poor performance under the GHGRP. The 1996 NSPS included exceedances for nitrogen levels (20 percent) or oxygen levels (5 percent), but EPA removed the thresholds for corrective action in the 2016 rulemaking. We support the Environmental Integrity Project's recommendation that EPA should establish a baseline for nitrogen and oxygen levels and then treat it as an indicator of poor performance if reported values deviate significantly from that baseline.

Through the GHGRP, EPA should require subpart HH landfills subject to NSPS/EG to report, along with their calculated f_{Rec} value, all monthly temperature, pressure, and oxygen/nitrogen readings, as well as any known periods of gas collection system downtime or poor performance (*e.g.*, due to construction, maintenance, or other conditions, such as wellhead flooding). Operators could also submit data collected by automated wellhead tuning devices, which enable continuous data collection on wellhead performance (temperature, pressure, gas composition, and liquid levels), to justify their annual f_{Rec} assumptions. This data will help EPA verify that subpart HH reporters' f_{Rec} values reflect gas collection system performance. Operators not subject to NSPS/EG can voluntarily conduct monthly or automated wellhead monitoring or should use an alternate f_{Rec} value, as determined by EPA.

Response: See response to comment EPA-HQ-OAR-2019-0424-0305-A1, Excerpt 3.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 17

Comment Excerpt: EPA should require reporting of additional activity data related to landfill emissions that will improve the accuracy of reported emissions and likewise inform future regulatory and non-regulatory efforts under the Clean Air Act. Specifically, EPA should require reporting on combustion device type and characteristics, GCCS type and design, any use of automated well tuning, wellhead monitoring data, monitoring methods used (including non-regulatory, voluntary monitoring), and cover types used. Gathering this information will allow EPA to understand the current operations of landfills impacting emissions and what types of emission control practices are already being used and could be required as part of future

regulations. We also reiterate our previous recommendation to require periodic waste characterization studies and reporting of the data. The amount and type of organics disposed of is critically important information to landfills' emissions profiles, and this data can help support future EPA programs and policies on organics diversion, which is the most effective long-term strategy to reduce greenhouse gases from landfills.

Response: See response to comment EPA-HQ-OAR-2019-0424-0305-A1, Excerpt 3.

19.7 Comments on other revisions and clarifications in subpart HH

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 2

Comment Excerpt: The Landfill Industry Commenters request that EPA clarify that any new GWP for methane would be used prospectively and not retroactively, and to consider the economic impact of additional years of reporting for the landfill sector under Subpart HH based on that GWP.

The Landfill Industry Commenters have a specific concern regarding how EPA's use of the new GWP for methane of 28 could impact MSW landfills that have previously exited the program, if appropriate clarifications are not made to Subpart HH. Landfill Industry Commenters note that the 2013 amendment to GWP acknowledged the unique nature of MSW landfills by revising Subpart HH § 98.340, Definition of the source category, to provide a methane-based approach to defining the source category, using the 2013 reporting year to clarify that the new GWP would not be applied retroactively to sources that had already been excluded from the program based on prior reporting and GWP. This approach, which we likewise recommend here, will not decrease the number of currently existing MSW landfills subject to the GHGRP, but would exclude those closed MSW landfills that have already exited the program and are no longer required to report. As such we propose EPA make the following revisions to be consistent with EPA's 2013 approach:

§ 98.340 Definition of the source category.

> (a) This source category applies to municipal solid waste (MSW) landfills that accepted waste on or after January 1, 1980, unless all three of the following conditions apply.
>
> (1) The MSW landfill did not receive waste on or after January 1, ~~2013~~ ***of the year after the year during which the change in GWP is published in the Federal Register as a final rulemaking.***
>
> (2) The MSW landfill had CH_4 generation as determined using Equation HH–5 and, if applicable, Equation HH–7 of this subpart of less than 1,190 metric tons of CH_4 in the 2013

reporting year ***or 1,000 metric tons of CH_4 of the year after the year during which the change in GWP is published in the Federal Register as a final rulemaking***

(3) The owner or operator of the MSW landfill was not required to submit an annual report under any requirement of this part in any reporting year prior to ~~2013~~ ***of the year after the year during which the change in GWP is published in the Federal Register as a final rulemaking.***

Response: The EPA appreciates the commenter's input. Based on an analysis of the combined effect of changing the GWP, DOC, and k value on methane generation, we do not believe the proposed changes for these parameters will bring into the reporting program closed MSW landfills that have never reported. Also, the provisions in 40 CFR 98.340(a) were specifically included to prevent closed landfills that had never reported under subpart HH from potentially having to report based solely on the change in GWP of methane. We find that these provisions would adequately prevent these never-have-reported closed landfills from having to report under this new revision in the GWP. Furthermore, the provisions in 40 CFR 98.340(a) were never intended to prevent landfills that may have off-ramped from having to report under subpart HH because we found that the burden for continuing to report once a facility has initially reported (*i.e.*, developed disposal quantities for all prior reporting years) is minimal. Therefore, we are not revising the provisions at 40 CFR 98.340(a) as suggested by the commenter.

Commenter Name: John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele
Commenter Affiliation: RMI
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0234-A1
Comment Excerpt Number: 4

Comment Excerpt: It appears unlikely that EPA's assumed collection efficiencies are broadly representative of the collection efficiencies at U.S. landfills with active gas capture systems, and it is even less likely that they provide reasonable estimates of the collection efficiency at an individual landfill. First, the overflight monitoring suggests that overall emissions can be far higher than reported. While this could be due either to overestimated collection efficiency and/or underestimated methane generation values, since the generation values are commonly directly derived from the amount collected using an assumed collection efficiency value, collection efficiency over-estimates are almost certainly at least part of the problem.

Second, studies show a wide range of collection efficiencies at different times after waste placement, in different areas of a given landfill, under different GCS systems, and with different types of cover materials.[32] While EPA's current values for collection efficiencies distinguish between daily, intermediate and final covers, a recent study by Cal Polytechnic for the California Air Resources Board underscores the wide variation between collection rates under different types of covers in each of these categories.[33] The study found that "[f]lux and emissions of methane, nitrous oxide, and [non-methane volatile organic compounds] are highly variable at a

given landfill and also between landfills."[34] Methane flux, which varied overall by an order of magnitude, varied by landfill and by cover category (daily, intermediate and final), as well as between different types of covers in a given category.[35] Across 10 California landfills with active gas capture systems, the study found that collection efficiencies ranged from 23% to 91% (estimated based on aerial emissions measurements), 39% to 100% (estimated based on measured ground data that excluded emissions from the active face of the landfill), and 25% to 76% (estimated based on modeled methane generation).[36] The study concluded, "[d]ue to large uncertainty in modeling gas generation, the use of collection efficiency as a measure of emissions may notbereliable."[37]

For example, the study found that, at the landfills it covered, conventional soil final covers were "significantly more effective" in reducing methane flux than alternative final covers, although both of these would have the same assumed collection efficiency under the regulations.[38] Similar variations were found between alternative daily covers and conventional daily covers, and between soil intermediate covers versus intermediate covers with green waste or wet waste.[39]

Yet the GHGRP requirements apply a single uniform value for every cover type that meets the minimum requirements in each category. Moreover, it appears that the uniform values of 60%, 75%, and 95% are relatively quite high compared to the collection efficiencies estimated from aerial and ground emissions measurements. This means that not only are individual landfill emissions estimates unreliable, but also that overall landfill emissions are systematically underestimated.

Another study recently calculated the average landfill methane capture rate for landfills in California using site-specific landfill gas measurement data from a NASA Jet Propulsion Laboratory study, the California Air Resources Board's Inventory of Waste-in-Place and Tier | Simplified Calculator for Organic Waste, and CalRecyle's 2018 Disposal-Facility-Based Characterization of Solid Waste in California.[40] This study estimated an overall methane capture rate of 34% from California landfills. While this is an average estimate for landfills across the state, it too strongly suggests that EPA's assumed collection efficiencies are far too high. The study's result is also conservative in the sense that it is based on California landfills, which are under a more stringent regulatory regime than landfills in most or all other states and hence should be emitting at relatively lower levels. An additional significant concern is that by applying a single collection efficiency per cover category regardless of the actual management practices, the current regulatory approach disincentivizes operators to improve their practices to better control methane emissions. Under the current and proposed regulations, even if operators increase their methane collection by improving collection efficiency, they must report higher, not lower, emissions, as the underlying quantity of methane generated is assumed to have increased.[41]

EPA should substantially lower the assumed collection efficiency rates to better reflect the efficiencies estimated based on aerial and ground emissions measurements. EPA should use recent estimates of collection efficiencies under various cover conditions based on measured emissions to identify evidence-based efficiency factors that account for the wide range — and far lower values — of site-specific collection efficiencies.

In addition, EPA should, if possible, establish two tiers of collection efficiency factors, with the upper tier of collection efficiency factors only applicable at landfills that use some or all of a set

of identified best practices, and with emissions performance confirmed through use of advanced monitoring and measurement. All landfills not meeting the best practices should be required to apply collection efficiency factors from the lower tier, which would specify conservative default collection efficiency rates.

The best management practices should identify the types of cover materials that are most effective. Operators should be required to report the type of material used and only allowed to apply the upper tier of collection efficiency rates if they are using soil covers with an adequate amount of clay or other fines or other cover types that have been shown to result in high collection efficiencies, as supported by peer-reviewed studies. In addition to identifying best practices for landfill cover types, EPA should identify other best practices that improve methane collection efficiency and should limit application of the upper tier of collection efficiency factors to operations using some or all of these practices.

A recent report by RMI lists recommended management practices for designing and operating landfills to reduce methane emissions.[44] Design practices include: using gabion cubes on the bottom liner; maintaining vertical landfill gas (LFG) wells by installing water pumps; ensuring optimal spacing for vertical LFG wells; using well boot seals; using a vacuum box when drilling vertical LFG wells; and designing the sequence of cell filling to minimize uncompacted slopes which tend to leak more emissions.[45] Two additional practices reduce overall emissions by capturing methane sooner after waste placement: early installation of horizontal LFG wells; and installing vertical LFG wells as soon as possible while raising the wellhead as the height of the disposed waste increases.[46]

Operation and maintenance practices include: continuous dynamic adaptation and upgrading of the GCS to meet changing conditions at the landfill; minimizing the daily working face where there is no cover to impede emissions; maintaining a minimum surface grade to promote drainage; periodic analysis of waste composition, with the results used to upgrade the GCS; using a more frequent or stringent landfill gas emission monitoring schedule; and using construction and demolition waste, such as crushed concrete, to create LFG travel pathways to the collection wells.[47]

As shown in the California Air Resources Study, cover management practices have a significant effect on measured emissions. Practices that reduce emissions include: increasing the thickness of the daily cover applied and peeling it back prior to new waste emplacement to promote leachate drainage and LFG movement; maximizing the density of applied soil cover by increasing compaction of daily and intermediate cover to decrease permeability and allow higher vacuum to be applied in the GCS; minimizing the time that trash is exposed to the air during the peel-back of daily or intermediate cover; adding vegetative cover to the intermediate layer to increase microbial oxidation; using Posi-Shell to enhance intermediate cover performance by lowering permeability; avoiding using green waste for alternative daily or intermediate cover; installing the final cover on an ongoing basis as soon as portions of the landfill have reached their final contours; and monitoring cover integrity for damage on an ongoing basis and repair damage as quickly as possible.[48]

Notably, EPA's Waste Reduction Model (WARM) provides temporally-weighted gas collection efficiency estimates for four different scenarios (typical, worst-case, aggressive, and a California

regulatory scenario). EPA could adopt a similar, or simplified, model for the GHGRP rule, aligning each subcategory with specific operational, maintenance, and monitoring practices.

Footnotes

[32] See, *e.g.*, Barlaz et al. (2009) Controls on Landfill Gas Collection Efficiency: Instantaneous and Lifetime Performance, J. Air & Waste Manage. Assoc. 59:1399; California Polytechnic State University (2020), Estimation and Comparison of Methane, Nitrous Oxide, and Trace Volatile Organic Compound Emissions and Gas Collection System Efficiencies in California Landfills (https://ww2.arb.ca.gov/resources/documents/landfill-gas-research); Anaergia. (January 27, 2022). Updated California Landfill Capture Rate Determination.

[33] California Polytechnic State University. (2020) Estimation and Comparison of Methane, Nitrous Oxide, and Trace Volatile Organic Compound Emissions and Gas Collection System Efficiencies in California Landfills. (https://ww2.arb.ca.gov/resources/documents/landfill-gas-research).

[34] Id.

[35] Id. at 5.

[36] Id. at 12.

[37] Id. at 13.

[38] Id. at 342.

[39] Id. at 340. Similarly, anecdotal evidence from experts familiar with landfill operations indicates that in areas of the country where sand is widely available, such as in coastal regions of the Southeast, operators commonly use sand for a cover material. Sand is not effective for maintaining a vacuum, keeping out moisture, or promoting soil oxidation. Nevertheless, the regulations direct operators to apply the same collection efficiency regardless of the type of cover material used.

[40] Anaergia. (January 27, 2022). Updated California Landfill Capture Rate Determination.

[41] See, *e.g.*, Barlaz (raising this concern).

[44] RMI, Carbon Mapper, IG3IS. (July 2022). Key Strategies for Mitigating Methane Emissions from Municipal Solid Waste. https://rmi.org/insight/mitigating-methane-emissions-from-municipal-solid-waste/.

[45] Id. at 47.

[46] Id.

[47] Id. at 48.

[48] Id. 49.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 75

Comment Excerpt: It appears unlikely that EPA's assumed collection efficiencies are broadly representative of the collection efficiencies at U.S. landfills with active gas capture systems, and it is also unlikely that they provide reasonable estimates of the collection efficiency at an individual landfill. First, overflight monitoring suggests that overall emissions can be far higher than reported. While this could be due either to overestimated collection efficiency and/or underestimated methane generation values, since the generation values are commonly directly derived from the amount collected given an assumed collection efficiency value, collection efficiency overestimates are almost certainly at least part of the problem.

Second, studies show a wide range of collection efficiencies at different times after waste placement, in different areas of a given landfill, under different GCS systems, and with different types of cover materials.[174] While EPA's current values for collection efficiencies distinguish between daily, intermediate, and final covers, a recent study by Cal Polytechnic for the California Air Resources Board underscores the wide variation between collection rates under different types of covers in each of these categories.[175] The study found that "[f]lux and emissions of methane, nitrous oxide, and [non-methane volatile organic compounds] are highly variable at a given landfill and also between landfills.[176] Methane flux, which varied overall by an order of magnitude, varied by landfill and by cover category (daily, intermediate and final), as well as between different types of covers in a given category.[177] Across ten California landfills with active gas capture systems, the study found that collection efficiencies ranged from 23% to 91% (estimated based on aerial emissions measurements), 39% to 100% (estimated based on measured ground data that excluded emissions from the active face of the landfill), and 25% to 76% (estimated based on modeled methane generation).[178] The study concluded, "[d]ue to large uncertainty in modeling gas generation, the use of collection efficiency as a measure of emissions may not be reliable."[179]

For example, the study found that, at the landfills it covered, conventional soil final covers were "significantly more effective" in reducing methane flux than alternative final covers, although both of these would have the same assumed collection efficiency under regulations.[180] Similar variations were found between alternative daily covers and conventional daily covers, and between soil intermediate covers versus intermediate covers with green waste or wet waste.[181] Yet the GHGRP requirements apply a single uniform value for every cover type that meets the minimum requirements in each category. Moreover, it appears that the uniform values of 60%, 75%, and 95% are quite high compared to the collection efficiencies estimated from aerial and ground emissions measurements.

Another study recently calculated the average methane capture rate for landfills in California using site specific landfill gas measurement data from a NASA Jet Propulsion Laboratory study, the California Air Resources Board's Inventory of Waste-in-Place and Tier 1 Simplified Calculator for Organic Waste, and CalRecyle's 2018 Disposal-Facility-Based Characterization of Solid Waste in California.[182] This study estimated an overall methane capture rate of 34% from California landfills. While this is an average estimate for landfills across the state, it too strongly suggests that EPA's assumed collection efficiencies are too high. The study's result is also conservative because it is based on California landfills, which are under a more stringent regulatory regime than landfills in most or all other states and hence should be emitting at relatively lower levels.

Furthermore, by applying a single collection efficiency per cover category regardless of the actual management practices, the current regulatory approach disincentivizes operators to improve their practices to better control methane emissions. Under the current and proposed regulations, even if operators increase their methane collection by improving collection efficiency, they must report higher, not lower, emissions, as the underlying quantity of methane generated is assumed to have increased.[183]

To address the concerns identified above regarding collection efficiency, EPA should substantially lower the assumed collection efficiency rates to better reflect the efficiencies estimated based on aerial and ground emissions measurements. EPA should use recent estimates of collection efficiencies under various cover conditions based on measured emissions to identify evidence-based efficiency factors that account for the wide range — and far lower values — of site-specific collection efficiencies.

In addition, EPA should, if possible, establish two tiers of collection efficiency factors, with the upper tier of collection efficiency factors only applicable at landfills that use some or all of a set of identified best practices, and with emissions performance confirmed through use of advanced monitoring and measurement, as discussed in below. All landfills not meeting the best practices would have to apply collection efficiency factors from the lower tier, which would specify conservative default collection efficiency rates.

The best management practices should identify the types of cover materials that are most effective. Operators should be required to report the type of material used and only allowed to apply the upper tier of collection efficiency rates if they are using soil covers with an adequate amount of clay or other fines or other cover types that have been shown to result in high collection efficiencies, as supported by peer reviewed studies. In addition to identifying best practices for cover type, EPA should identify other types of best practices that improve methane collection efficiency and should limit application of the upper tier of collection efficiency factors to operations using some or all of these practices.

A recent report by RMI lists recommended management practices for designing and operating landfills to reduce methane emissions.[184] Design practices include: using gabion cubes on the bottom liner; maintaining vertical landfill gas (LFG) wells by installing water pumps; ensuring optimal spacing for vertical LFG wells; using well boot seals; using a vacuum box when drilling vertical LFG wells; and designing the sequence of cell filling to minimize uncompacted slopes which tend to leak more emissions.[185] Two additional practices reduce overall emissions by capturing methane sooner after waste placement: early installation of horizontal LFG wells; and installing vertical LFG wells as soon as possible while raising the wellhead as the height of the disposed waste increases.[186]

Operation and maintenance practices include: continuous dynamic adaptation and upgrading of the GCS to meet changing conditions at the landfill; minimizing the daily working face where there is no cover to impede emissions; maintaining a minimum surface grade to promote drainage; periodic analysis of waste composition, with the results used to upgrade the GCS; using a more frequent or stringent landfill gas emission monitoring schedule; and using construction and demolition waste, such as crushed concrete, to create LFG travel pathways to the collection wells.[187]

As shown in the California Air Resources Study, cover management practices have a significant effect on measured emissions. Practices that reduce emissions include: increasing the thickness of the daily cover applied and peeling it back prior to new waste emplacement to promote leachate drainage and LFG movement; maximizing the density of applied soil cover by increasing compaction of daily and intermediate cover to decrease permeability and allow higher vacuum to be applied in the GCS; minimizing the time that trash is exposed to the air during the peel-back of daily or intermediate cover; adding vegetative cover to the intermediate layer to increase microbial oxidation; using Posi-Shell to enhance intermediate cover performance by lowering permeability; avoiding using green waste for alternative daily or intermediate cover; installing the final cover on an ongoing basis as soon as portions of the landfill have reached their final contours; and monitoring cover integrity for damage on an ongoing basis and repairing damage as quickly as possible.[188]

Notably, EPA's Waste Reduction Model (WARM) provides temporally-weighted gas collection efficiency estimates for four different scenarios (typical, worst-case, aggressive, and a California regulatory scenario). EPA could adopt a similar, or simplified, model for the GHGRP rule, aligning each subcategory with specific operational, maintenance, and monitoring practices.

Footnotes

[174] See, *e.g.*, Barlaz et al., Controls on Landfill Gas Collection Efficiency: Instantaneous and Lifetime Performance, 59 J. Air & Waste Mgmt. Assoc. 1399 (Dec. 2009), https://doiorg/10.3 155/1047-3289.59.12.1399; California Polytechnic State University, Estimation and Comparison of Methane, Nitrous Oxide, and Trace Volatile Organic Compound Emissions and Gas Collection System Efficiencies in California Landfills (Mar. 25, 2020) (https://ww2.arb.ca.gov/resources/documents/landfill-gas-research); Anaergia, Updated California Landfill Capture Rate Determination (Jan. 27, 2022).

[175] California Polytechnic State University, supra note 174.

[176] Id.

[177] Id. at 5.

[178] Id. at 12.

[179] Id. at 13

[180] Id. at 342.

[181] Id. at 340. Similarly, anecdotal evidence from experts familiar with landfill operations indicates that in areas of the country where sand is widely available, such as in coastal regions of the Southeast, operators commonly use sand for a cover material. Sandis not effective for maintaining a vacuum, keeping out moisture, or promoting soil oxidation, all of which could decrease methane generation. Nevertheless, the regulations direct operators to apply the same collection efficiency regardless of the type of cover material used.

[182] CalRecyle's 2018 Disposal-Facility-Based Characterization of Solid Waste in California, https://www2.calrecycle.ca.gov/Publications/Download/1458.

[183] See, *e.g.*, Barlaz supra note 174 (raising this concern).

[184] Ebun Ayandele et al., RMI, Key Strategies for Mitigating Methane Emissions from Municipal Solid Waste (July2022), https://rmi.org/insight/mitigating-methane-emissions-from-municipal-solid-waste/.

[185] Id. at 47.

[186] Id.

[187] Id. at 48.
[188] Id. at 49.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 2

Comment Excerpt: The performance of landfill gas collection systems is of critical importance as this is one of the primary means of reducing the release of landfill gases into the ambient air. One of EPA's two approaches for estimating landfill methane emissions in the GHGRP — the first-order decay approach — does not incorporate landfill collection efficiency at all. Instead, that method requires the operator to account for gas collected and destroyed by a gas collection and control system ("GCCS") by using data measured on-site to calculate the quantity of methane recovered for destruction.

The second of EPA's approaches, the back-calculation method, utilizes default collection efficiencies. EPA sets forth the 3 default collection efficiency values in Table HH–3 for active GCCS.

- Area with daily soil cover and active gas collection: 60%.
- Area with an intermediate soil cover, or a final soil cover not meeting the criteria for [3] below, and active gas collection: 75%
- Area with a final soil cover of 3 feet or thicker of clay or final cover (as approved by the relevant agency) and/or geomembrane cover system and active gas collection: 95%

For passive systems, the default collection system efficiency is zero. In addition, "if area by soil cover type information is not available," the operator is instructed to use a default value of 75% collection efficiency "for all areas under active influence of the collection system." We believe that these default efficiencies are likely too high and we understand that other environmental organizations, including RMI and Environmental Defense Fund ("EDF"), plan to submit information supporting this argument. Certainly, if default efficiencies must be used, a conservative efficiency ought to be used in the absence of information about soil cover type. We are not aware of information indicating that 75% is a conservative assumption about collection efficiency.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele
Commenter Affiliation: RMI
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0234-A1
Comment Excerpt Number: 5

Comment Excerpt: The large degree of uncertainty regarding actual collection efficiencies and the likelihood that the current default collection efficiency factors are far too high makes the back-calculation method of estimating emissions inappropriate. Under equation HH–8, the assumed collection efficiencies determine the reported emissions estimates. Thus, unless and until EPA identifies highly representative collection efficiency values with low uncertainty, the GHGRP regulations should require operators to report emissions based on the application of equation HH–6 and should remove the option of reporting based on the application of equation HH–8.

Response: We disagree that HH–8 is not informative. For example, the DOC values used for HH–1 (and HH–6) are based on gas recovery data and assumed recovery, which is information gathered from HH–8 reporters.

Commenter Name: John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele
Commenter Affiliation: RMI
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0234-A1
Comment Excerpt Number: 9

Comment Excerpt: To align with regulatory standards and actual measurements of flare efficiency, EPA should lower the destruction efficiency assumption in equation HH–6 from 99% to 95%. Until in-situ measurements of landfill flares are conducted to better estimate emissions and destruction efficiency, EPA should base reporting on conservative estimates that it relies on in regulations and that are supported by recent scientific evidence.[51] Similarly, if gas is being sent off site for destruction, EPA should require reporting on whether that gas is being flared, and if so, HH–6 should require use of 95% destruction efficiency too, not 100%.

Unifying flare reporting requirements across Subparts and with regulatory standards will create more consistent estimates and allow for insights from one source category to improve performance and regulations in another. The addition of elements requiring flow measurement devices and documenting periods of unlit flares will also add some empirical verification to flare reporting, leading to more accurate reporting.

Footnotes

[51] Plant et al., Inefficient and unlit natural gas flares both emit large quantities of methane, 377 Science 6614 (2022), https://www.science.org/doi/10.1126/science.abq0385.

Response: We did not propose to reduce the default destruction efficiency, but instead clarified that its value should be "0" if no flame is present.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 78

Comment Excerpt: The large degree of uncertainty regarding actual collection efficiencies and the likelihood that the current default collection efficiency factors are far too high makes the back-calculation method of estimating emissions inappropriate. Under equation HH–8, the assumed collection efficiencies determine the reported emissions estimates. Thus, unless and until EPA identifies highly representative collection efficiency values with low uncertainty, the reporting standards should require operators to report emissions based on the application of Equation HH–6 and should remove the option of reporting based on the application of HH–8.

Response: See response to comment EPA-HQ-OAR-2019-0424-0234-A1, Excerpt 5.

Commenter Name: Not provided
Commenter Affiliation: Clean Air Task Force (CATF), Environmental Defense Fund (EDF), and RMI
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0330-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA should require the use of lower collection efficiencies across all landfills as the default unless the reporter can demonstrate through monitoring or other data that the current subpart HH default is appropriate. While adding surface emission monitoring exceedances can help account for some cover system leaks, the default collection efficiencies are likely still too high. We again urge EPA to substantially lower the default collection efficiency assumptions to better reflect the collection efficiencies estimated based on recent aerial and ground emissions measurements. The Nesser at al. study discussed above found a mean collection efficiency of 50% based on thousands of observations from the TROPOMI satellite in contrast to the default collection efficiencies in the subpart HH formula, which are based on

more limited studies.[4] Another recent study (CalPoly, 2020) found collection efficiency across ten California landfills ranged widely, from 23% to 100% based on aerial and ground-based measurement approaches. EPA should therefore lower the default collection efficiency for all subpart HH reporters but
allow landfill operators to use a higher collection efficiency if they follow identified best management practices and can confirm their emissions performance through monitoring or other data.

Footnotes

[4] The collection efficiencies were calculated using reported direct emissions reductions from the Landfill Methane Outreach Program (LMOP) together with reported and observation-informed emissions estimates. LMOP includes both the direct emission reductions and the avoided emission reductions. The former are the "direct methane reductions by the energy project for the current year" while the latter are "avoided carbon dioxide emission reductions by the energy project for the current year"—so these are secondary avoided emissions associated with avoided fuel consumption by using repurposed methane. Nesser et al. use the former. Since the collected methane is a commodity, Nesser et al. have some confidence in the reported value for avoided emissions (compared to low confidence in the reported emissions).

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0305-A1
Comment Excerpt Number: 2

Comment Excerpt: EIP appreciates EPA's engagement with EIP's October 2022 Comments on the collection efficiency discrepancies between voluntary and regulated GCCS. EIP demonstrated this finding through an analysis of data in Maryland, which EPA also analyzed as part of this GHGRP Supplemental Proposal. EIP also supports EPA's efforts to address this discrepancy with the landfills with a voluntary GCCS by lowering the HH-3 values by 10 percentage points.

Part of EPA's reasoning on the differences found by EIP for collection efficiencies at landfills in Maryland is that landfill cover plays a critical role in the efficiency of a GCCS. Cover has been demonstrated to influence the collection efficiency of a GCCS.[23] In fact, a study performed by the California Polytechnic State University also found that "methane fluxes decreased in order of daily to intermediate to final covers with a higher decrease from intermediate to final covers than from daily to intermediate covers."[24] The study concluded that increased thickness and density of the cover material was correlated with reduced emissions.[25]

The GHGRP approaches the differences in cover type through Table HH–3. Final cover is defined as 3 feet or thicker of soil or clay and is allowed the highest collection efficiency.[26]

However, in HH–3, intermediate cover is not required to have a certain depth, and is only differentiated from daily cover as "intermediate soil cover, or a final soil cover not meeting the criteria for [final soil cover]" but is allowed higher defaults than daily cover.[27] However, in Table HH–4 (which addresses the oxidation effect of cover), EPA does specify that "[w]here a landfill is located in a state that does not have an intermediate or interim cover requirement, the landfill must have soil cover of 12 inches or greater in order to use an oxidation fraction of 0.25 or 0.35."[28]

EPA should revise Table HH–3 to include the requirement from Table HH–4 that interim cover must be 12 inches or greater in order to use the corresponding default collection efficiency. This revision would streamline how cover is defined and how the collection efficiencies are used in Table HH–3. This revision would also demonstrate that the type of landfill cover plays a critical role in the efficiency of a GCCS.

Footnotes

[23] Cover material, design, and application can reduce landfill methane emissions by inhibiting the flow of gases, by removing methane from the gas that is released, and by reducing infiltration of rain and snow melt into the landfill. James L. Hanson & Nazli Yesiller, Cal. Polytechnic State Univ., Estimation and Comparison of Methane, Nitrous Oxide, and Trace Volatile Organic Compound Emissions and Gas Collection System Efficiencies in California Landfills 22 (2020), https://ww2.arb.ca.gov/sites/default/files/2020-06/CalPoly%20LFG%20Flux%20and%20Collection%20Efficiencies%203-30-2020.pdf [hereinafter "Cal Poly report"].

[24] Id. at 5.

[25] Id. at 350.

[26] 95% for regulated and 85% for voluntary. 88 Fed. Reg. 32852, 32934 (May 22, 2023).

[27] Active gas collection and daily soil cover results in 60% collection efficiency for regulated landfills and 50% for landfills with a voluntary GCCS. Id. at 32934.

[28] 40 C.F.R. § 98, Subpt. HH, Tbl. HH-4. A number of states also require intermediate covers to be at least 12 inches, for example: "intermediate cover must not be less than 12 inches of suitable earthen material" 30 Tex. Admin. Code

Response: EPA appreciates the commenter's input on the subpart HH default collection efficiencies. In response to comments received and the review of various studies cited by commenters, the EPA is finalizing, lower gas collection efficiencies for all landfills. EPA appreciates the input to further revise Table HH–3 to align with soil cover considerations in Table HH–4 and may review this further for consideration in a future rulemaking for subpart HH.

Commenter Name: Michael E. Van Brunt
Commenter Affiliation: Covanta Energy, LLC
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0308-A1
Comment Excerpt Number: 3

Comment Excerpt: New measurement techniques and studies have added significantly to our understanding of landfill emissions since the defaults for landfill gas collection efficiency were adopted in 2009; however, this new body of research has not been reflected in updated efficiency values.[3] Recent studies have found that over the life of waste in a landfill, the lifetime gas collection efficiency is estimated to only be 35%-70%, which is far below the current GHGRP defaults.[4, 5, 6, 7] Similarly, the EPA's own two-year study of measured methane emissions in 2012 did "not support the use of collection efficiency values of 90% or greater" as is currently allowed for landfills with final cover.[8] Current defaults do not account for landfill gas escaping through cracks and imperfections in the surface cap, around wells and penetrations, through leachate collection systems, and through the cap itself which result in lower collection efficiencies and higher measured landfill emissions compared to what is reported.[9] In fact, a series of studies employing direct measurement of methane plumes via aircraft downwind of several U.S. landfills found that actual measured landfill emissions were on average double the amount reported in GHG inventories.

[See DCN EPA-HQ-OAR-2019-0424-0308-A1, pg. 2, for commenter's table of studies conducted as referenced in above sentence.]

To increase accuracy, we recommend that the EPA utilize alternative measurement techniques to determine default collection efficiencies. Flux chamber data largely informs the current defaults utilized by the GHGRP despite several recent studies finding that flux chambers underestimate emissions.[16, 17, 18]

A 2020 study in California found that flux chamber measurements indicated significantly higher collection efficiency estimates than aerial measurements, which have the capability to measure an entire landfill's methane plume.[19] Utilizing the inflated collection efficiency estimates will result in current landfill modeling to underreport methane emissions. As the Executive Director of UNEP, Inger Andersen, stated in the recent Global Methane Assessment, methane is "the strongest lever we have to slow climate change over the next 25 years;" thus, it is imperative that landfill methane reporting is accurate.[20]

We ask the EPA to validate its emissions models against landfill emission data collected using more representative measurement technologies and to propose appropriate changes to the landfill gas collection efficiency defaults to ensure that emissions modeling better aligns with the current data on landfill methane emissions.

Footnotes

[3] United States Environmental Protection Agency (US EPA), 2009. Protection of Environment; Mandatory Reporting of Greenhouse Gases; Subpart HH - Municipal Solid Waste Landfills; 74 Fed. Reg. 56374, URL: https://www.federalregister.gov/documents/2009/10/30/E9- 23315/mandatory-reporting-of-greenhouse-gases.

[4] Fischedick M. et al. (2014) Industry. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. URL: https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter10.pdf

[5] Levis, J., M.A. Barlaz (2014) Landfill Gas Monte Carlo Model Documentation and Results, URL: https://19january2017snapshot.epa.gov/www3/epawaste/conserve/tools/warm/pdfs/lanfl_gas_mont_carlo_modl.pdf

[6] CalRecycle (2012) CalRecycle Review of Waste-to-Energy and Avoided Landfill Methane Emissions. URL: https://pw.lacounty.gov/epd/conversiontechnology/download/CalRecycle_Review_of_WtE_Avoided_Emissions_07032012.pdf

[7] See Exhibit 7 9 of U.S. EPA (2015) Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model (WARM), URL: https://archive.epa.gov/epawaste/conserve/tools/warm/pdfs/WARM_Documentation.pdf

[8] U.S. EPA (2012) Quantifying Methane Abatement Efficiency at Three Municipal Solid Waste Landfills. URL: http://www.epa.gov/nrmrl/pubs/600r12003.html

[9] Hans Oonk, 2012. Efficiency of Landfill Gas Collection for Methane Emissions Reduction. URL: https://www.tandfonline.com/doi/full/10.1080/20430779.2012.730798#:~:text=When%20no%20measurements%20are%20available%2C%20IPCC%20guidelines%20allow,gas%20collection%20to%20be%20much%20higher%20than%2020%25.

[16] United States Environmental Protection Agency (US EPA), 2009. Protection of Environment; Mandatory Reporting of Greenhouse Gases; Subpart HH - Municipal Solid Waste Landfills; 74 Fed. Reg. 56374, URL: https://www.federalregister.gov/documents/2009/10/30/E9- 23315/mandatory-reporting-of-greenhouse-gases.

[17] Mønster, J., Kjeldsen, P., Scheutz, C., 2019. Methodologies for measuring fugitive methane emissions from landfills – A review. Waste Management 87, 835-859. https://doi.org/10.1016/j.wasman.2018.12.047

[18] Scharff, H., Jacobs, J., Oonk, H., Hensen, A., n.d., 2005. Methods to ascertain methane emission of landfills. NV Afvalzorg Holding. URL: https://www.afvalzorg.nl/content/uploads/2017/09/Paper-methods-to-ascertain-methane-emission.pdf

[19] Hanson, J., et al. (2020), Estimation and Comparison of Methane, Nitrous Oxide, and Trace Volatile Organic Compound Emissions and Gas Collection System Efficiencies in California Landfills, The California Air Resources Board (CARB). https://ww2.arb.ca.gov/sites/default/files/2020-12/CalPoly_LFG_Study_03-30-20.pdf

[20] UNEP, 2021. Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions. URL: https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methaneemissions#:~:text=Global%20Methane%20Assessment%3A%20Benefits%20and%20Costs%20of%20Mitigating,plays%20in%20slowing%20the%20rate%20of%20global%20warming.bal

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 10

Comment Excerpt: In addition to the Duren study, EPA considered a study of Maryland landfills undertaken by the Environmental Integrity Project ("EIP"), in which EIP calculated collection efficiency for the studied landfills based on data reported to the state GHG inventory for 2017, using collected landfill gas as a portion of modeled landfill gas generation. Despite the inherent deficiencies in comparing actual to modeled data, the EIP study concluded that collection efficiencies for landfills with voluntarily installed landfill gas collection and control systems (for which no surface methane emission monitoring was required) were 21 percentage points lower than the collection efficiencies for landfills with federal mandated landfill gas collection and control systems (for which surface methane emission monitoring was required). EIP 2021. *Greenhouse Gas Emissions From Maryland's Landfills: Underestimated and Under Regulated*. June 9. Available at: https://environmentalintegrity.org/wp-content/uploads/2021/06/MD-Landfill-Methane-Report-6.9.2021-unembargoed_with-Attachments.pdf (hereinafter, "EIP Study").

EPA then compared the collection efficiencies reported by EIP for 14 of those Maryland landfills which also reported under Subpart HH of the GHGRP for reporting year 2017, and concluded that there was a 22-percentage point difference between the EIP collection efficiencies for those landfills with voluntary landfill gas collection and control systems and those with federally mandated landfill gas collection and control systems. EPA then also compared the reported collection efficiencies for those same 14 landfills as reported under Subpart HH and concluded that there was a 13-percentage point difference between the Subpart HH collection efficiencies for those Maryland landfills with voluntary gas collection systems and those with federally mandated landfill gas collection systems. On that basis, the Agency proposes additional default collection efficiencies in Table HH–3 to account for the apparent reduced collection efficiencies observed for landfills for which surface methane emission monitoring is not performed. See Memo from Liz Goodiel to Docket ID No. EPA-HQ-OAR-2019-0424, Technical *Support for Supplemental Revisions to Subpart HH; Municipal Solid Waste Landfills*, at p. 8. Specifically, the EPA proposes new 10-percent lower collection efficiencies for landfills for which surface emission monitoring is not conducted.

EPA's reliance on the EIP Study in support of the Proposed Rule is unwarranted, because the EIP Study does not appear to have been peer reviewed in a manner consistent with EPA's General Assessment Factors and its Peer Review Policy. In the acknowledgements, two EIP authors are credited with reviewing the EIP study. See EIP Study at p. 1, 2. However, according to EPA's Peer Review Policy, peer review only occurs when "scientifically and technically based work products are evaluated by relevant experts who were not involved in creating the product" (emphasis added). EPA, Peer Review and Peer Involvement at the U.S. Environmental Protection Agency. The two acknowledged reviewers work for EIP and assisted with some of the data analysis for this specific study, and thus were involved in the creation of the final product. EPA's Peer Review Handbook emphasizes that "peer review of scientific and technical work products that support regulations is an important, fundamental step in policy setting and regulatory development processes." Peer Review Handbook, at p. 28-9.1 Any work product that is "important to EPA decision making" and "independently generated," such as this study by EIP, "should be considered as [a] candidate for peer review." Id. at 47. Especially when relying on scientific or technical information from an outside organization, EPA "should work with that organization… to promote the use of peer review." Id. at 48. The fact that this study was not properly peer reviewed in accordance with EPA's own guidance, calls into question the data

quality and credibility of the primary study used by EPA as a justification for the agency's proposed revisions to Subpart HH.

Response: See response to comment EPA-HQ-OAR-2019-0424-0319-A1, Excerpt 6.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 11

Comment Excerpt: In its Technical Support Memo, EPA acknowledges that the differences between the EIP and Subpart HH reported collection efficiency could be attributed to methodology. Specifically, the Memo states: "The subpart HH calculated collection efficiencies are consistently higher than those determined from the Maryland inventory data. This may indicate that the subpart HH defaults are too high, but it may also indicate that the "potential methane generation capacity" input term for LandGEM (which is analogous to the DOC term used in Equation HH–1) is higher than the actual potential CH_4 generation capacity of the waste being disposed. That is, because the CEs determined from the Maryland data are based on modeled CH_4 generation rather than actual measured CH_4 emissions from the landfills, it is just as likely that the Maryland CEs are biased low as the subpart HH CEs are biased high." *Technical Support Memo* at p.8.

The majority of the Maryland landfills (13 out of 14) in the EPA's comparison are County-owned landfills that generally do not accept significant out-of-state waste tonnages. The Maryland Recycling Act state law enacted in 1988 requires counties to divert compostable waste/organics and recyclable waste from landfill waste streams. Counties with <150,000 people must divert 20 percent and counties with >150,000 people must divert 35 percent. Many Maryland counties also have a focus on voluntary (non-state mandated) organics diversion from landfills. Furthermore, waste incineration currently is a significant method of waste management in Maryland, with two major waste incineration facilities in high population areas (in operation since 1985 and 1995) and two coal power plants. The EIP study appears to fail to account for these considerations. Because of the state-mandated requirements for waste diversion (which has significantly reduced methane-producing waste disposed in Maryland landfills for the past 20-30+ years) coupled with the higher percentage of inert incinerator ash it is more likely that the EIP Maryland collection efficiencies are biased low because the potential methane generation capacity LandGEM input term is too high.

Furthermore, as noted above, the EIP study compares actual landfill gas recovery rates to modeled results in order to estimate collection efficiency. Because this approach uses actual landfill gas recovery, this calculation would already account for factors such as gas system operation/downtime. In contrast, Subpart HH collection efficiencies are based solely on the proportion of landfill areas with gas collection and specific cover types (daily, intermediate or

final cover) and do not incorporate factors such as gas collection operation and destruction device operation. As such, this would further bias low the EIP Maryland collection efficiencies when compared to Subpart HH collection efficiencies. It should be noted that the Subpart HH methane emission rate calculated by equation HH–8 does account for these through the f_{Rec} and f_{Dest} terms, which are distinct parameters separate from the Subpart HH collection efficiency factor.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0319-A1
Comment Excerpt Number: 12

Comment Excerpt: Maryland is a comparatively small state with a comparatively low number of active landfills. There are currently only four (4) federally-regulated landfills in Maryland (the 3 landfills in the EPA's comparison plus the Sandy Hill Landfill). In contrast, there are hundreds of federally-regulated landfills across the U.S. In combination with the waste diversion rates and incinerator ash waste streams, Maryland landfills are not representative of all the landfills that would be subject to EPA's proposed changes across the sector. With the low number of landfills in its comparison, EPA's dataset does not allow for analysis of statistically-significant differences between landfills and, apart from incorporation into a larger dataset, should not be used to justify changes to requirements applicable to landfills across the U.S.

EPA's proposed rule change regarding collection efficiency presumes that performing surface emission monitoring is the sole or primary factor for the differences in collection efficiency between EIP and Subpart HH landfills in Maryland. In its Technical Support Memo, EPA states that it is "clear that landfills that have federally required GCCS appear to have higher CEs than voluntary systems." Technical Support Memo at p.8. We agree with the statement in that, on average, landfills with federally-required GCCS would be expected to have higher collection efficiencies than landfills with voluntary collection systems. This difference is due to the fact that federally-regulated systems are required to provide comprehensive control, must meet prescriptive timelines for system GCCS expansion, and must limit system downtime to a minimum, and not based on whether or not surface emission monitoring is performed. Landfills with voluntary systems are often designed with different objectives, such as to provide localized odor or migration control and/or to provide gas collection over a limited area of the landfill. Voluntary systems also are not subject to federal requirements to limit system downtime, and may therefore operate on an intermittent basis or with large periods of downtime. These factors are, however, already addressed in the current Subpart HH, equation HH–8 methodology.

Maryland landfills are not representative of landfills across the U.S. and represent a small subset with a low number of federally regulated landfills. Therefore, this data should not be used in isolation from other landfills in the U.S. for comparing Subpart HH collection efficiencies and LandGEM modeling-based collection efficiency. It appears EPA failed to consider key variables in its analysis including differences in waste disposal streams (and associated differences in potential methane generation capacity), calculation methodologies for collection efficiencies based on reported collection volumes, and the significance of federal expansion timelines and downtime limitations over the performance of SEM.

Like its reliance on the California aerial study, the Agency's use of the Maryland study to support a change to the default collection efficiency table in Subpart HH represents an inappropriate change that is based on a small subset of landfills that is likely not representative of the sector, and which will lead to an inaccurate and overreporting of GHG emissions from the sector.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Morton Barlaz
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0286-A1
Comment Excerpt Number: 2

Comment Excerpt: The memo then goes on the cite a Maryland study where the collection efficiency is calculated as collected gas divided by modeled methane generation. **Models of methane generation are sufficiently uncertain that it is not defensible to calculate CE in this manner.** EPA recognizes this is in the memo but seems to use the data anyway:

"This may indicate that the subpart HH defaults are too high, but it may also indicate that the potential methane generation capacity" input term for LandGEM (which is analogous to the DOC term used in Equation HH–1) is higher than the actual potential CH_4 generation capacity of the waste being disposed. That is, because the CEs determined from the Maryland data are based on modeled CH_4 generation rather than actual measured CH_4 emissions from the landfills, it is just as likely that the Maryland CEs are biased low as the subpart HH CEs are biased high."

It is possible that landfills that do not require surface methane concentration measurements (SMCM) have lower CEs. One explanation is that such landfills may have fewer gas collection wells than a landfill that falls under NSPS regulations. I would nonetheless challenge EPA to justify this conclusion based on more defensible data. As stated above, I think that cover soil type and gas well coverage are more critical determinants of CE. With respect to this equation: [See DCN EPA-HQ-OAR-2019-0424-0286-A1 for emissions (Mg/day) equation on page 2] It is based on summer measurements in a Northern climate. Why does EPA think that it should be generalized to the entire U.S.? I agree that a landfill with a high number of surface exceedances would be indicative of a lower collection efficiency than a landfill with a lower number of

surface exceedances. I would rather simply lower the allowable CE than pretend to quantify methane emissions in the manner proposed. Of course, I would like to see clear logic for lowering the CE.

Response: See section III.T.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA sets forth default factors to account for oxidation: a process that occurs in soils or other materials that, under the right circumstances, removes methane before it enters the air. We are concerned that EPA addresses the issue of oxidation at the facility-level rather than at the landfill cell-level, does not require reporting of cover material type, and defines "interim or intermediate" cover in a vague way that could be interpreted to include daily cover. EPA should revise subpart HH to address these issues.

EPA's default "oxidation fractions" are set forth Table HH–4. They effectively establishes a default 10% reduction factor for oxidation. While operators may select from different options, 10% (0.10) is the factor for all reporting years before 2013. From 2013 on, 10% is also the default for landfills at which the operator does not elect to determine methane flux and uses soil (or no cover all apparently) for at least 50% of landfill coverage. Some higher values are allowed in certain circumstances.

It is concerning that a landfill that uses soil for cover at only 50% of the landfill area containing waste are allowed to use the 10% oxidation factor. In its 2019 GHG inventory guidance, IPCC recommends a default oxidation factor of 0 unless a higher value is justified, stating:

The use of the oxidation value of 0.1 [10%] is justified for covered, well managed SWDS to estimate both diffusion through the cap and escape by cracks/fissures. The use of an oxidation value higher than 0.1, should be clearly documented, referenced, and supported by data relevant to national circumstances. It is important to remember that any CH_4 that is recovered must be subtracted from the amount generated before applying an oxidation factor. [See DCN EPA-HQ-OAR-2019-0424-0226-A1 for Table 3.2. IPCC Recommended Oxidation Factors[22].]

Given that oxidation cannot occur in landfill cells that are not covered with an oxidizing material, EPA should not address oxidation on a facility-wide basis. Instead, EPA should require the use of cell-specific oxidation information and should not allow for a 10% or higher oxidation factor for any part of a landfill unless that area is actually covered with oxidizing material.

Response: The EPA did not propose to revise the oxidation fractions used in subpart HH nor to change reporting to the landfill cell level. As such, this comment is out of scope for this rulemaking.

Commenter Name: John Coequyt, Alexandra Tietz, Ellie Garland, Olivia Alves, Tom Frankiewicz, and Ebun Ayandele
Commenter Affiliation: RMI
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0234-A1
Comment Excerpt Number: 3

Comment Excerpt: In both the first order decay and back-calculation approaches, Subpart HH reporters can offset their methane emissions estimates with the oxidation fractions in Table HH–4, ranging between 0% and 35%, depending on cover stage and methane flux rate.

While methane oxidation can play an important role in reducing methane emission from landfills, estimation of methane oxidation is complicated by large observed variability.[25] A typical assumption is that 10% of methane is oxidized in landfills.[26] However, experts have suggested relying on a single fixed value, or narrow set of fixed values, is not appropriate.[27] Methane oxidation relies on the appropriate species of methanotrophs being present and conditions to support growth of these species. Methanotrophs can be impacted by presence of toxic chemicals, soil temperature, and soil moisture. Ideal soil temperature is 25-35°C and soil moisture is 10-20%.[28] Due to the dependence of methane oxidation on soil temperature and moisture, experts have suggested that rigorous models are needed to estimate methane oxidation over time that account for temporal variations.

While some research has suggested that average values of methane oxidation of 30% are observed, observations can range from negligible up to more than 30%.[29] Limited oxidation was cited as a likely cause of underestimation of methane emissions in several California landfills located in hot, dry conditions.[30] Methane oxidation is also slowed in cold conditions. When applying a methane oxidation of 10%, Spokas (2015) found that sometimes methane was overestimated, and sometimes it was underestimated. This result points to the large uncertainty with methane oxidation estimation that is highly impacted by local conditions and site management. While methodologies exist that have been found to promote methane oxidation, those approaches have been observed to decrease in efficacy with time.[31] We are concerned that conditions specified in Table HH–4 and the methane oxidation fraction linked to each set of specified conditions do not appropriately capture the wide range of variability of, and factors driving, oxidation rates, and thus do not adequately represent real-world oxidation rates at landfills.

Due to the large uncertainty in estimation of methane oxidation, we recommend EPA consult rigorous models that account for site-specific landfill cover characteristics, temporal variation in soil temperature and moisture, and that are verified by measured data. In the absence of rigorous, field-verified models, EPA has not yet developed a reliable estimate of methane oxidation, and

we do not believe that an across-the-board application of a 10% oxidation factor (as allowed under C3 in Table HH–4 of the current regulations) is justified by the available science.

We recommend that EPA revise the GHGRP formulas to disallow use of a methane oxidation factor, with the exception of sites where landfill cover is specifically designed to achieve methane oxidation and the oxidation estimates are supported by onsite measurements of methane oxidation, conducted at least annually. EPA should work to identify rigorous emission estimation models that account for temporal variations in soil conditions resulting from weather to estimate methane oxidation with time. Once such models are available, EPA could revise the reporting requirements to allow or require the models' application to estimate oxidation rates, as long as this is coupled with requirements for periodic site measurements of methane oxidation to confirm that oxidation rates are remaining stable (after accounting for temperature and soil moisture). Absent these improvements, we do not believe that the science supports the use of methane oxidation factors in estimating emissions under the current or proposed regulations.

Footnotes

[25] Bala Y Sadasivam et al. (2014). Landfill methane oxidation in soil and bio-based cover systems: a review. Rev Environ Sci Biotechnol 13: 79-107. https://doi.org/10.1007/s11157-013-9325-z; National Academies of Sciences, Engineering, and Medicine. (2018). Improving Characterization of Anthropogenic Methane Emissions in the United States. http://nap.edu/24987

[26] IPCC (2006).

[27] National Academies of Sciences, Engineering, and Medicine. (2018). Improving Characterization of Anthropogenic Methane Emissions in the United States. http://nap.edu/24987

[28] Charlotte Scheutz et al. (2004). Environmental Factors Influencing Attenuation of Methane and Hydrochlorofluorocarbons in Landfill Cover Soils. Journal of Environmental Quality, 33(1): 72-79. https://doi.org/10.2134/jeq2004.7200; Charlotte Scheutz et al. (2009). Microbial methane oxidation processes and technologies for mitigation of landfill gas emissions. Waste Manag Res, 27(5): 72-79. https://pubmed.ncbi.nlm.nih.gov/19584243/; Hanson et al. (1996). Methanotrophic bacteria. Microbiological Reviews, 60(2). https://journals.asm.org/doi/10.1128/mr.60.2.439-471.1996; Boeckx et al. (1996). Methane emission from a landfill and the methane oxidizing capacity of its covering soil. Soil Biology and Biochemistry, 28(10-11). https://doi.org/10.1016/S0038-0717(96)00147-2.

[29] NAS (2018).

[30] Kurt Spokas et al. (2015). From California dreaming to California data: Challenging historic models for landfill CH_4 emissions. Elementa: Science of the Anthropocene, 3: 000051. https://doi.org/10.12952/journal.elementa.000051.

[31] Sadisivam et a. (2014).

Response: See response to comment EPA-HQ-OAR-2019-0424-0226-A1, Excerpt 4.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 74

Comment Excerpt: In both the first order decay and back-calculation approaches, subpart HH reporters can offset their methane emissions estimates with the oxidation assumptions under Table HH–4, ranging between 0% and 35%, based on cover stage, cover material, and methane flux rate.

While methane oxidation can play an important role in reducing methane emission from landfills, estimation of methane oxidation is complicated by large observed variability.[167] A typical assumption is that 10% of methane is oxidized in landfills.[168] However, experts have suggested that relying on a single fixed value, or narrow set of fixed values, is not appropriate.[169] Methane oxidation relies on the appropriate species of methanotrophs being present and conditions to support growth of these species. Methanotrophs can be impacted by presence of toxic chemicals, soil temperature, and soil moisture.[170] Ideal soil temperature is 25-35°C and soil moisture is 10-20%.[171] Due to the dependence of methane oxidation on soil temperature and moisture, experts have suggested that rigorous models are needed to estimate methane oxidation over time that account for temporal variations.

While some research has suggested average values of methane oxidation of 30%, observations range from negligible to more than 30%.[172] Limited oxidation was cited as a likely cause of underestimation of methane emissions in several California landfills located in hot, dry conditions.[173] Methane oxidation is also slowed in cold conditions (Scheutz et al. 2009). When applying a methane oxidation of 10%, Spokas (2015) found that sometimes methane was overestimated, and sometimes it was underestimated. This result points to the large uncertainty with methane oxidation estimation that is highly impacted by local conditions and site management. While methodologies exist that have been found to promote methane oxidation, those approaches have been observed to decrease in efficacy with time. We are concerned that conditions specified in Table HH–4 and the methane oxidation fraction linked to each set of specified conditions do not appropriately capture the wide range of variability of, and factors driving, oxidation rates, and thus do not adequately represent real-world oxidation rates at landfills.

Due to the large uncertainty in estimation of methane oxidation, we recommend EPA use rigorous models that account for site-specific landfill cover characteristics and temporal variation in soil temperature and moisture that are verified by measured data. In the absence of rigorous models that are field verified, EPA has not yet developed a reliable estimate of methane oxidation, and we do not believe that an across-the board application of a 10% oxidation factor (as allowed under C3 in Table HH–4 of the current regulations) is justified by the available science.

We recommend that EPA revise the reporting formulas to disallow use of a methane oxidation factor, with the exception of sites where landfill cover is specifically designed to achieve methane oxidation and the oxidation estimates are supported by onsite measurements of methane oxidation, conducted at least annually. EPA should work to identify rigorous emission estimation models that account for temporal variations in soil conditions resulting from weather to estimate methane oxidation with time. Once such models are available, EPA could revise the reporting requirements to allow or require the models' application to estimate oxidation rates, as long as

this is coupled with requirements for periodic site measurements of methane oxidation to confirm that oxidation rates are remaining stable (after accounting for temperature and soil moisture). Absent these improvements, we do not believe that the science supports the use of methane oxidation factors in estimating emissions under the current or proposed regulations.

Footnotes

[167] Bala Y Sadasivam et al., Landfill Methane Oxidation in Soil and Bio-based Cover Systems: A Review, 13 Rev Environ Sci Biotechnol 79 (2014), https://doi.org/10.1007/s 11 157-013-9325-z; National Academies of Sciences, Engineering, and Medicine. (2018). Improving Characterization of Anthropogenic Methane Emissions in the United States. http://nap.edu/24987.

[168] TPCC (2006).

[169] NAS (2018).

[170] Charlotte Scheutz et al. (2004). Environmental Factors Influencing Attenuation of Methane and Hydrochlorofluorocarbons in Landfill Cover Soils. Journal of Environmental Quality, 33(1): 72-79. https://doi.org/10.2134/jegq2004.7200; Charlotte Scheutz et al. (2009). Microbial methane oxidation processes and technologies for mitigation of landfill gas emissions. Waste Manag Res, 27(5): 72-79. https://pubmed.ncbi.nlm.nih.gov/19584243/; Hanson et al. (1996). Methanotrophic bacteria. Microbiological Reviews, 60(2). https://journals.asm.org/doi/10.1128/mr.60.2.439-471.1996; Boeckx et al. (1996). Methane emission from a landfill and the methane oxidizing capacity of its covering soil. Soil Biology and Biochemistry, 28(10-11). https://doi.org/10.1016/S0038-0717(96)00147-2.

[171] Charlotte Scheutz et al. (2004). Environmental Factors Influencing Attenuation of Methane and Hydrochlorofluorocarbons in Landfill Cover Soils. Journal of Environmental Quality, 33(1): 72-79. https://doi.org/10.2134/jeq2004.7200; Charlotte Scheutz et al. (2009). Microbial methane oxidation processes and technologies for mitigation of landfill gas emissions. Waste Manag Res, 27(5): 72-79. https://pubmed.ncbi.nlm.nih.gov/19584243/; Hanson et al. (1996). Methanotrophic bacteria. Microbiological Reviews, 60(2). https://journals.asm.org/doi/10.1128/mr.60.2.439-471.1996; Boeckx et al. (1996). Methane emission from a landfill and the methane oxidizing capacity of its covering soil. Soil Biology and Biochemistry, 28(10-11). https://doi.org/10.1016/S0038-0717(96)00147-2.

[172] NAS 2018.

[173] Kurt Spokas et al. (2015). From California dreaming to California data: Challenging historic models for landfill CH_4 emissions. Elementa: Science of the Anthropocene, 3: OOOOS1. https://do.org/10.12952/journal.elementa.00005 1.

Response: See response to comment EPA-HQ-OAR-2019-0424-0226-A1, Excerpt 4.

Commenter Name: Leah Kelly
Commenter Affiliation: Environmental Integrity Project (EIP)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0226-A1
Comment Excerpt Number: 13

Comment Excerpt: EPA established oxidation default values in reference to intermediate, interim, and final cover. The term "intermediate or interim cover" is defined in a vague way that could easily be interpreted by landfill operators as applying to daily cover. Specifically, it is

defined as: "the placement of material over waste in a landfill for a period of time prior to the disposal of additional waste and/or final closure as defined by state regulation, permit, guidance or written plan, or state accepted best management practice."

EPA should revise its subpart HH regulations to more precisely define "intermediate cover" and "interim cover." If EPA does not intend the definitions to apply to daily cover, then those definitions should be revised to exclude daily cover.

Response: EPA intentionally defined "intermediate or interim cover" to be general because the requirements for intermediate covers (and the terms used to refer to these types of covers) vary by state or permitting authority. We note in Table HH–4 that unless expressly allowed by the state, an intermediate or interim cover must be soil cover of 12 inches or more. For the landfill gas collection efficiencies noted in Table HH–3, daily soil covers are distinct and separate from intermediate covers. Daily covers are generally 3 to 6 inches of soil cover while intermediate covers are commonly 12 to 18 inches. EPA appreciates the commenter's input and will consider the comment for future rulemaking for subpart HH.

20.0 Comments on Subpart OO of Part 98

20.1 Revisions to report end uses and aggregated annual quantities of N_2O, PFCs, and SF_6 transferred to each end use

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 27

Comment Excerpt: SIA believes the Subpart OO increased chemical supply tracking by "each end use, if known" may constitute a potential risk to semiconductor industry and individual company confidential business information. Chemical suppliers or distributors do not typically have visibility to end use, particularly specific end use categories.

SIA requests EPA clarify that chemical supply "end use" refers to industry category only, such as electronics or semiconductor use, and does not refer to more specific uses.

Response: The EPA has patterned this requirement to report end use after the reporting requirement under subpart PP (40 CFR 98.426(f)). A proposed list of end uses for nitrous oxide, saturated perfluorocarbons, and sulfur hexafluoride was given in the preamble to the 2022 Data Quality Improvements Proposal. Regarding the clarification of "end use," see section III.U.2 of the preamble to the final rule for the EPA's response to this comment. Reporters would be required to report the end uses and quantity of each gas used by their customers for that end use. These end uses of each of these chemicals will help EPA in future tracking of use and fate of each chemical reportable under this subpart.

20.2 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart OO

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0191-A1
Comment Excerpt Number: 28

Comment Excerpt: SIA requests EPA clarify that chemical supply "end use" refers to industry category only, such as electronics or semiconductor use, and does not refer to more specific uses. The specific purchases and purposes of chemical use should be considered semiconductor industry confidential business information and therefore protected from public disclosure.

Response: The EPA has proposed the confidentiality determinations for the two new subpart OO data elements (for nitrous oxide, saturated perfluorocarbons, and sulfur hexafluoride, the end use(s) for which each GHG is transferred; for nitrous oxide, saturated perfluorocarbons, and sulfur hexafluoride, the aggregated annual quantity of GHG that is transferred to that end use application) as "Eligible for Confidential Treatment" and EPA is finalizing these determinations as proposed.

Commenter Name: Not provided
Commenter Affiliation: Semiconductor Industry Association (SIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0311-A1
Comment Excerpt Number: 7

Comment Excerpt: SIA requests EPA clarify that chemical supply "end use" refers to industry category only, such as electronics or semiconductor use, and does not refer to more specific uses. The specific purchases and purposes of chemical use should be considered semiconductor industry confidential business information and therefore protected from public disclosure.

SIA believes the tracking of gas and chemical use to applications such as temperature control, device testing (thermal shock testing), cleaning substrate surfaces and other parts and soldering introduces burdensome requirements for tracking chemical applications and introduces potential confidentiality concerns.

Response: See response to comment EPA-HQ-OAR-2019-0424-0191-A1, Excerpt 28.

21.0 Comments on Subpart PP of Part 98

21.1 Revisions to the source category to include Direct Air Capture (DAC) as a carbon capture option

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 23

Comment Excerpt: We support the inclusion of direct air capture (DAC) as a CO_2 capture option under subpart PP. EDF also supports the intent behind the requirement that DAC facilities report their upstream energy use. However, EDF is concerned that the proposed lifecycle analysis (LCA) reporting requirements do not take into account the full lifecycle CO_2 impacts of the technology through the point of CO_2 compression. Understanding the full emissions impacts of DAC systems beyond their energy use is crucial to assessing their effectiveness as carbon removal tools.

The proposed definition of DAC under 40 CFR § 98.6 may encompass a large variety of DAC technologies which utilize different materials, components, and processes to capture CO_2 from ambient air. To ensure standard and consistent LCA reporting across different DAC technologies, EDF recommends that EPA adopt ISO 14040/14044 standards for DAC LCA and that EPA require suppliers to define a cradle-to-gate boundary for their DAC system. This system boundary should include all activities associated with the DAC technology, from the extraction of raw materials required to construct, maintain, and power the functional unit to the on-site compression of CO_2. EDF recommends that EPA also require suppliers to report the pressure of compressed CO_2 to assess consistency across DAC facilities.

Response: The EPA acknowledges the commenter's support for inclusion of DAC under subpart PP. Regarding the suggestion to require a cradle-to-gate system boundary, it is not EPA's intent to require a full LCA for DAC facilities nor to define the boundaries of an LCA. Rather, we believe these data elements are important to understand the sources and amounts of energy used by DAC facilities to power the DAC plant from air intake at the facility through custody transfer of captured CO_2 or, if the CO_2 does not leave the facility, injection of captured CO_2. These data may be used to support LCAs and other analyses, but EPA is not proposing to require facilities to perform an LCA at this time.

Regarding suggestions to require reporting of pressure of compressed CO_2, the EPA thanks the commenter for their input. However, these comments do not specifically address the proposed rule and are beyond the scope of this rulemaking. The EPA notes the commenter's suggestion and may consider it in a future rulemakings.

Commenter Name: Jessie Stolark
Commenter Affiliation: Carbon Capture Coalition
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0302-A1
Comment Excerpt Number: 1

Comment Excerpt: Direct air capture (DAC) is expected to play an important role in meeting midcentury climate goals by offsetting challenging-to-decarbonize sectors, as well as addressing legacy emissions in the atmosphere. As DAC projects reach commercial maturity, the GHGRP should be updated to ensure that DAC equipment owners can properly demonstrate the permanent storage or utilization of captured CO_2 to claim the 45Q tax credit. The Coalition reiterates its support of EPA's proposal to revise 40 CFR 98.6 to add direct air capture to the list of suppliers of CO_2 and adding DAC to the definition of "carbon dioxide stream." The Coalition supports EPA using the statutorily defined definition of DAC in the Clean Air Act (42 U.S.C 7403(g)) for the purposes of the GHGRP.

Response: We acknowledge the commenter's support and are finalizing the definition of "carbon dioxide stream" in 40 CFR 98.6 to include DAC. In addition, the EPA is finalizing the definition of the source category 40 CFR 98.420 to include DAC as proposed.

21.2 Revisions to reporting requirements

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 86

Comment Excerpt: The LCA requirement proposed under 40 CFR § 98.426(i) may not take into account all of the factors relevant to the CO_2 impact of DAC systems within the system boundary. EDF recommends that suppliers be required to report and account for CO_2 emissions from all inputs and outputs contained within the system boundary. This includes inputs such as raw materials and outputs such as co-products and waste products, in addition to on-site and off-site sourced electricity, heat and combined heat and power used to power the system. EPA should require suppliers to report the quantities of each of these inputs and outputs involved as well as the CO_2 emissions impact from each. EDF also recommends that all suppliers be required to report their data sources as well as any sensitivities or uncertainties in the data reported.[226]

Footnotes

[226] Department of Energy, Office of Fossil Energy and Carbon Management (June 2022) - Best Practices for Life Cycle Assessment (LCA) of Direct Air Capture with Storage (DACS), https://www.energy.gov/fecm/best-practices-LCA-DACS.

Response: It was not the EPA's intent in the proposed rule to require a full LCA for DAC facilities nor to define the boundaries of an LCA. See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 23 in section 21.1 of this document for more information.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 23

Comment Excerpt: EPA is seeking comment on further expanding the list of end-use applications reported in 40 CFR 98.426(f) to better account for and track emerging CO_2 end uses. Similar to our comments under Subpart P, the market for CO_2 utilization continues to develop. As such, the Industry Trades are recommending EPA allow, in this rulemaking, flexibility in how this information is reported by allowing reporters the ability to select from a representative range of end-uses, including allowing for instances when the end-use is 'other.' The Industry Trades believe that this information could be captured in EPA's forms and updated as needed to account for innovation in this emerging market.

Response: The EPA agrees with commenter regarding the inclusion of a category for "other" to ensure that the rule retains flexibility in how end-use information is reported. However, a change to the proposed rule is not necessary in this case because 40 CFR 98.426(f) already includes a reporting category for "other," thus the existing rule already provides the necessary flexibility.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 16

Comment Excerpt: We support the amendment to subpart PP, section 98.426(f). EPA proposes to add a new data element to 40 C.F.R. § 98.426(f) that would require suppliers to report the annual quantity of CO_2 in metric tons that is transferred for use in geologic sequestration with enhanced oil recovery (EOR) subject to subpart VV. This proposal will provide consistency and clarity for suppliers of CO_2 who, without this change, would be forced to report under another end use listed in section 98.426(f).

Response: The EPA acknowledges the commenter's support, and is finalizing the rule requiring suppliers of carbon dioxide to report the annual quantity of CO_2 in metric tons that is transferred for use in geologic sequestration with enhanced oil recovery (EOR) subject to subpart VV.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 17

Comment Excerpt: We support the amendments to subpart PP, section 98.426(h) and EPA's expansion of the applicability of 40 C.F.R. § 98.426(h) beyond subpart D reporters. The proposed language will apply to any direct emitting facility that is the source of CO_2 captured and transferred to facilities subject to subparts RR or VV, rather than being applicable only to reporters subject to subpart D. These changes are necessary for EPA to fully track captured and sequestered CO_2 in the economy.

Response: The EPA acknowledges the commenter's support. We are finalizing the reporting requirements as proposed. Subpart PP facilities that supply CO_2 to facilities subject to subparts RR or VV will be required to report the facility identification number of the facility that is the source of the captured CO_2, the facility identification number of each subpart RR and VV facility that receives the CO_2, and the annual quantities of CO_2 supplied to each subpart RR and VV facility.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 21

Comment Excerpt: As proposed, reporters would be required to report the facility identification number associated with the annual GHG reports for each Subpart RR and VV facility to which CO_2 is provided. Additionally, EPA is seeking comment on whether to expand the reporting requirements for all receivers of CO_2, not just those facilities subject to Subparts RR and VV.

The Industry Trades support EPA's efforts to increase accuracy in tracking supplies of CO_2 in the economy, but request EPA to analyze whether both senders and receivers of CO_2 reporting is redundant.

The Industry Trades also recommend that EPA provides additional information on how CO_2 suppliers for export could appropriately address exports in their report. For example, clarity in reporting is needed to address situations in which a company supplies CO_2 to a non-reporter that is a subsidiary of a larger company that does report.

Response: The EPA acknowledges the commenter's support of the proposed rules with respect to the new requirements for supply of CO_2 to subpart RR and VV reporters. The EPA does not believe that expanding the applicability of 98.426(h) will result in duplicative reporting. Facilities receiving CO_2 report general information on the source of CO_2 supply but do not report detailed information on the quantities received from each unique supplier and do not report the supplying GHGRP facility identification number(s). Requiring this information under subpart PP does not introduce duplicative reporting requirements among suppliers and receivers of CO_2. The EPA is, therefore, finalizing the new reporting requirements in 40 CFR 98.426(h) as proposed to extend the reporting requirements in 40 CFR 98.426(h) to the supply of CO_2 to subpart RR and VV facilities. Regarding other end uses, the EPA may propose new reporting requirements in future rulemakings.

21.3 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart PP

Commenter Name: William Swetra
Commenter Affiliation: Oxy Low Carbon Ventures (OLCV)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0217-A1
Comment Excerpt Number: 4

Comment Excerpt: Direct air capture (DAC) is a nascent technology that will need to be significantly scaled in the coming decades to help curb global temperature rise and enable society to achieve climate goals. While we support EPA's efforts to understand the life cycle emissions of DAC facilities more fully, we believe public disclosure of the annual quantity of electricity consumed to power the DAC process unit and natural gas used for thermal energy could undermine the commercial deployment of DAC. Therefore, this information, while still reported to EPA, should be determined CBI.

DAC facilities will need access to clean power to drive the process and achieve desired CO_2 reductions. Power in a DAC facility is one of the main operating expenses and power consumption is directly related to power cost. A comprehensive understanding of a DAC's power demand, coupled with a basic understanding of the clean power markets in the region where the DAC facility is located, could be used to estimate the DAC power cost. This knowledge, if available to a competitor or provider of clean power, would impact business-to-business contract negotiations, allow for speculation on potential profit margins on captured CO_2 volumes, and negatively impact the ability of a DAC operator to procure clean power at competitive rates.

Further, many carbon capture technologies will utilize natural gas to provide the thermal energy needed to drive the CO_2 capture process, including DAC facilities. To maximize the net-CO_2 benefit from a DAC facility, it is important that the natural gas supply be responsibly sourced. Contract negotiations for the supply of natural gas for DAC facilities are competitive and a major operating cost for a DAC facility. Information on the annual amount of natural gas consumed by a DAC facility, if available to a competitor or natural gas supplier, will impact the ability of a DAC operator to contract for responsibly sourced natural gas supply at a competitive cost. With

this in mind, we ask that natural gas consumption be declared CBI. This does not, however, diminish our support for the requirement to report on whether flue gas is also captured by the DAC process unit. This requirement allows for a clear distinction of CO_2 captured from the process vs. CO_2 captured from the air, increasing public trust in reported CO_2 volumes. In compliance markets, like California's Low Carbon Fuel Standard, process inputs like raw materials, water, power, fuel gas, etc., are typically claimed as CBI. However, the GHG emissions associated with the facility are reported and publicly available. This provides an example of how new technologies can be commercialized while providing their GHG emissions and protecting operating costs and supply chains. In closing, we suggest the GHG emissions that are required to be reported to EPA from a DAC facility be made publicly available, while the annual quantity of electricity and natural gas consumed to power the DAC facility be determined CBI.

Response: See section VI.B.2 of the preamble to the final rule for the EPA's response to this comment.

22.0 Comments on Subpart QQ of Part 98

22.1 Revisions to reporting requirements (40 CFR 98.436)

Commenter Name: Not provided
Commenter Affiliation: National Foreign Trade Council (NFTC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0296-A1
Comment Excerpt Number: 1

Comment Excerpt: The information contained on CBP Form 7501 for each entry is currently provided electronically in the form of data that is collected by U.S. Customs and Border Protection (CBP) through the Automated Commercial Environment (ACE) and is available to all U.S. government agencies with a regulatory role in the importation of goods into the United States. As a result, entry requirements are satisfied without the need to develop, submit, or maintain paper copies of completed 7501 forms by importers in the normal course of business. The Environmental Protection Agency (EPA) has access to ACE and participates in the Border Interagency Executive Council[1] and CBP's Commercial Targeting and Analysis Center[2]. Both groups facilitate the sharing and analysis of entry data provided to CBP and would give EPA access to the data it is seeking through the proposed paper submission requirement.

The EPA already has access to the desired data through participation in ACE maintained by CBP. The information provided to the government in that electronic process should be sufficient to identify which entries are subject to data requirements under Subpart QQ of Part 98 and provide responsive data in formats that are more useful to EPA.

The EPA should coordinate with CBP through established bodies (*e.g.*, the Border Interagency Executive Council and Commercial Targeting and Analysis Center) to identify and utilize existing means of improving the quality of data collection rather than creating a costly and

environmentally unfriendly administrative burden that will impact manufacturing and production sectors that are already challenged by inflation and supply chain challenges.

Footnotes

[1] https://obamawhitehouse.archives.gov/the-press-office/2014/02/19/executive-order-streamliningexportimport-process-america-s-businesses

[2] https://www.cbp.gov/trade/priority-issues/import-safety/ctac-partner-agencies

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: National Foreign Trade Council (NFTC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0296-A1
Comment Excerpt Number: 2

Comment Excerpt: Requiring the submission of hard-copy entry records such as CBP Form 7501 for each entry of applicable commodities represents an unnecessary administrative burden on importers to provide information already available to the EPA and runs counter to CBP's longstanding effort to collect import data and documents electronically. For example, one company has reported that they filed over 70,000 entries in 2022 that would be subject to this new rule, and each entry would require submission of a multiple-page 7501 form. The creation and submission of these documents in hard copy or scanning into an electronic system would be prohibitively expensive and would not provide EPA with any additional data.

The requirement to submit paper forms that are not otherwise required to be maintained in such a way is counter to Executive Order 13659 and 19 U.S.C. 1411(d), as amended by Sections 106 and 107 of the Trade Facilitation and Trade Enforcement Act of 2015.[3] Each of these legal authorities advances the goal of providing for electronic transmission of import data rather than antiquated reliance upon paper-based forms and seeks to eliminate the need for duplicative information submissions across U.S. government agencies with regulatory authority related to goods entered or imported into the United States.

Footnotes

[3] P.L. 114-125 (Feb. 24, 2016), accessible here: https://www.congress.gov/114/plaws/publ125/PLAW114publ125.pdf

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Automotive Policy Council (AAPC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0300-A1
Comment Excerpt Number: 1

Comment Excerpt: Our concern pertains to a provision in the Revised Rule that would amend the current Subpart QQ reporting obligations to require the filing of paper form (*i.e.*, hard copy) documentation – paper form documentation that will include the same information that automakers already provide to U.S. Customs and Border Protection (CBP) through their Automated Commercial Environment (ACE) system.

For automakers, the proposed change would require filing with EPA the same paperwork that they currently provide electronically through the ACE system. Like other federal regulatory agencies, EPA has full access to the information in ACE. Moreover, EPA is a "Partner Government Agency" (PGA) in CBP's Border Interagency Executive Council (BIEC), which works closely with EPA and other regulatory agencies to optimize data sharing. In fact, the BIEC's stated aim is to "allow businesses to submit the data required by [CBP] and its [PGAs] to import or export cargo through a 'single window' concept."[1] Requiring hard copy submission of documents that include information already provided to a federal government agency electronically clearly works at cross-purposes with such a single window concept.

The new paper form requirements also work at cross-purposes with industry efforts to further automate their record-keeping and reporting systems, which save them time, money and, of course, paper. The Revised Rule will force our industry to move backwards – requiring automakers to manually transmit to EPA hard copies of information already provided to CBP electronically, or by scanning and uploading that same information into an EPA computer interface.

To the extent that EPA has concerns with the availability, quality, or accuracy of the GHG related information it currently receives, we urge the agency to utilize existing workstreams and interagency partnerships, some of which were established for this very purpose: to optimize information sharing between and among federal agencies, while minimizing compliance burdens and unnecessary paperwork for those subject to federal rules and regulations. These interagency partnerships include the BEIC, as well as CBP's Commercial Targeting and Analysis Center, of which EPA is also a "partner agency."

Footnotes

[1] Exec. Order No. 13659 (Feb. 19, 2014); 3 CFR 13659 (2014); CBP website (https://www.cbp.gov/trade/borderinteragency-executive-council-biec).

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: John I. Taylor
Commenter Affiliation: LG Electronics USA, Inc.
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0317-A1
Comment Excerpt Number: 1

Comment Excerpt: LG Electronics USA, Inc. (LG USA) respectfully requests that the Agency not require importers of pre-charged equipment or closed-cell foam to provide EPA with a copy of the corresponding U.S. Customs entry form for each reported import, as proposed in the Supplemental Notice of Proposed Rulemaking in the above-referenced proceeding.[1] If implemented, this requirement would impose an extraordinary and unnecessary burden on importers. A less burdensome, yet equally effective, alternative exists that would allow the Agency to meet the same policy objectives.

As proposed, this requirement would obligate importers of pre-charged equipment or closed-cell foam, including LG USA, to help improve the quality of data collection under the Greenhouse Gas Reporting Program by producing copies of any corresponding CBP entry forms such as CBP form 7501. Although LG USA does retain this documentation through its customs broker as required by the Agency's current rules, no consolidated set of these records exists. To comply with the proposed rule change, LG USA (and most other importers) would need to compile and produce these documents manually, on an entry-by-entry basis. In LG USA's case, this is at least 1,300 manual searches.

LG USA suggests that EPA consider requiring that importers run and produce a detailed entry summary report from the CBP Automated Commercial Environment (ACE) for each relevant product tariff classification.[2] For example, an Entry Summary Line Detail Report would show the total quantity reported for entry summary lines by tariff number for the reported unit of measure. Such reports capture the actual data in CBP's system, as filed by importers, and should be more than sufficient to ensure that the Agency is able to improve the verification and accuracy of the data it collects.[3]

LG USA supports the Agency's efforts "to improve the quality of the data that are currently reported, to collect more useful data to improve verification of reported data, to better characterize U.S. GHG emissions and trends, and to extend the usefulness of the GHGRP to inform and improve the EPA's ability to carry out other CAA programs."[4] This proposed revision to the reporting requirements for importers of pre-charged equipment or closed-cell foam would meet these objectives in the most efficient way possible.

Footnotes

[1] Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule, Supplemental Notice of Proposed Rulemaking, EPA–HQ–OAR–2019–0424, 88 Fed. Reg. 32852, 32882-83 (proposing to amend 40 C.F.R. Part 98, subpart QQ at § 98.436(a)) (SNOPR).

[2] See https://www.cbp.gov/trade/automated (last visited July 21, 2023).

[3] See SNOPR Section II(D), 88 Fed. Reg. at 32861-62.

[4] Id. at 32861.

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Jeff Hansbro
Commenter Affiliation: DuPont Performance Building Solutions
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0289-A1
Comment Excerpt Number: 1

Comment Excerpt: The border crossing documentation would merely confirm the amount of foam board imported or exported and would not validate the F-gas quantity which is noted as the intent of this draft rule and is the intent of the QQ report. Even if border documents are provided, it would be impossible for the EPA to validate the current reports as the calculations involved to provide the volume of F-gas per board foot would require detailed technical knowledge, including density of the foam board. This highly confidential and technical data is not available within the border crossing documentation.

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Jeff Hansbro
Commenter Affiliation: DuPont Performance Building Solutions
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0289-A1
Comment Excerpt Number: 2

Comment Excerpt: We question whether the inclusion of both HTS codes and Schedule B codes is necessary for validation of the data that is currently collected, which we believe to be accurate, as all polystyrene foams use the same codes. Requiring more than one type of document would prove redundant in showing product type, burdensome for manufacturers and for the EPA, and would not provide any additional clarity or validation to the current report.

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Jeff Hansbro
Commenter Affiliation: DuPont Performance Building Solutions
Commenter Type: Industry
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0289-A1
Comment Excerpt Number: 6

Comment Excerpt: If any additional documentation should be mandatory, we believe that only the border crossing document should be required as part of the annual report. The border crossing documents include the customs tariff number, with the first six digits of an HTS and Schedule B number that are always the same for a particular product. It must be noted that the border crossing documents share highly sensitive information such as quantity and price, so security of all information must be a stated priority for the EPA with a specific procedure for handling this.

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

22.2 Comments on other revisions and clarifications in subpart QQ

Commenter Name: Jeff Hansbro
Commenter Affiliation: DuPont Performance Building Solutions
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0289-A1
Comment Excerpt Number: 3

Comment Excerpt: We are concerned about the new reporting requirement for importers to submit copies of the corresponding border crossing forms as part of their annual reports. This would necessitate a substantial amount of additional work and resources to comply, including gathering documentation from multiple sources prior to annual reporting, which may require hiring additional staff. The current requirement to file data by March 31st of the year following the reporting year is already extremely short and burdensome, so the increased volume of documentation would likely put much more pressure on businesses than they can manage in the short turnaround time frame.

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Automotive Policy Council (AAPC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0300-A1
Comment Excerpt Number: 3

Comment Excerpt: Contrary to the estimate included in the EPA’s regulatory impact analysis for the Revised Rule,[2] the cost of complying with these new requirements will be substantial. In addition to extra man-hours, the Revised Rule will also require substantial modifications to

automakers' existing information systems and processes for their GHG and related reporting obligations – also at a substantial cost in terms of both time and money expended.

Footnotes

[2] According to the EPA's Assessment of Burden Impacts for Proposed Revisions for the Greenhouse Gas Reporting Rule (Docket Id. No. EPA–HQ–OAR–2019–0424), compliance with the new paper form submission requirements would cost companies just $384. (See, Section VII (Impacts of the Proposed Amendments), Table 10 (https://www.regulations.gov/document/EPA-HQ-OAR-2019-0424-0255).

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: National Foreign Trade Council (NFTC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0296-A1
Comment Excerpt Number: 6

Comment Excerpt: If EPA is unable to identify applicable entries through more efficient means, importers filing reports under Subsection QQ should only be asked to identify specific entry numbers that will allow EPA to identify applicable electronic submissions within ACE.

Response: See section III.W.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Jeff Hansbro
Commenter Affiliation: DuPont Performance Building Solutions
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0289-A1
Comment Excerpt Number: 5

Comment Excerpt: We believe that businesses should be given more time to adjust to any new requirements, and that a required date of enforcement/compliance take into consideration the time needed for businesses to adequately prepare for reporting. For example, if the rule finalizes in Fall 2023, then documentation would be required for the reporting year of 2025 with 2024 data. EPA should delay implementation of the new requirements to allow businesses to prepare and have time to develop and implement a process for document gathering, retrain staff, or hire additional staff to handle the highly sensitive business information required.

Response: The EPA has removed the documentation requirements that could potentially be a large burden on reporters. The EPA is finalizing the requirement to report HTS and Schedule B codes, which facilities should already know from normal business operations. Therefore, we believe the final timeline is reasonable.

22.3 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart QQ

Commenter Name: Jeff Hansbro
Commenter Affiliation: DuPont Performance Building Solutions
Commenter Type: Industry
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0289-A1
Comment Excerpt Number: 4

Comment Excerpt: As always, all data collected for the QQ report is, and would be, considered highly confidential business information. Access to this type of information is restricted internally, which adds complexity to who could manage and deal with the processing of this documentation within our company.

Response: The EPA proposed confidentiality determinations for 40 CFR 98.436(a)(7) (the harmonized tariff system (HTS) code for each type of pre-charged equipment imported in the year and the HTS code for each type of closed-cell foam imported in the year), 40 CFR 98.436(a)(8) (a copy of the corresponding U.S. Customs entry form for each reported import in the year), and 40 CFR 98.436(b)(7) (the schedule B code for each type of pre-charged equipment exported in the year and the schedule B code for each type of closed-cell foam exported in the year). The EPA is not taking final action on 40 CFR 98.436(a)(8); see section III.W.2 of the preamble to the final rule for additional information.

The EPA proposed to assign the new data elements at 40 CFR 98.436(a)(7) and (b)(7) a confidentiality determination of "no determination." The EPA will evaluate the confidentiality status of data elements with no determination on a case-by-case basis in accordance with existing regulations in 40 CFR part 2, subpart B because capacity data elements may be customarily and actually treated as private by some reporters but may be publicly available in some instances (see 76 FR 30801, May 26, 2011). The EPA did not propose any data elements under subpart QQ to be "Not Eligible" for confidential treatment. Therefore, the EPA is finalizing the confidentiality determinations for these data elements as proposed. See the memorandum "Confidentiality Determinations and Emission Data Designations for Data Elements in the 2024 Final Revisions to the Greenhouse Gas Reporting Rule," available in the docket to this rulemaking. available in the docket to this rulemaking, EPA-HQ-OAR-2019-0424.

23.0 Comments on Subpart RR of Part 98

23.1 Revisions to subpart RR (Geologic Sequestration of Carbon Dioxide)

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka

Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 24

Comment Excerpt: Although EPA is not currently proposing any revisions to subpart RR, recent attention regarding the prospect of CO_2 sequestration in subsurface formations below the Outer Continental Shelf (OCS) has raised the issue of GHGRP applicability for such projects after they have been permitted by the Department of Interior (DOJ). In discussions about DOI's forthcoming rulemaking, there have been mixed interpretations as to whether subpart UU remains an acceptable option for reporting for long-term storage wells on the OCS. We believe that subpart RR applies to any well operating for geologic storage of CO_2, including in the offshore environment, regardless of whether the well is permitted as a Class VI well under the Safe Drinking Water Act or a different authority. This is based on:

-The absence of any exception for offshore projects in the subpart RR source category definition;

- Numerous references to modified requirements where an "offshore well is not subject to the Safe Drinking Water Act" — such as subpart RR, § 98.448(b)(2): "if your facility is an offshore facility not subject to the Safe Drinking Water Act, you must submit a proposed MRV plan to EPA within 180 days of receiving authorization to being geologic sequestration of CO_2"; and

- The definition of "surface leakage" including movement of injected CO_2 stream from the injection zone into oceans in subpart RR, § 98.449.

In order to avoid any uncertainty, EDF requests that EPA make definitively clear that any offshore facility permitted to inject CO_2 for long-term containment in a subsurface geologic formation on federal lands, including the Outer Continental Shelf, is subject to the requirements of subpart RR. Further, we recommend that EPA collaborate with DOI in their forthcoming rulemaking to ensure that this requirement is appropriately accounted for in that process.

Response: We agree that offshore facilities that meet the subpart RR source category definition would be required to report under subpart RR. The regulations make various references to offshore facilities, such as in 40 CFR 98.446(f)(14). In the supplemental rulemaking (88 FR 32852) dated May 22. 2023, the EPA proposed adding a definition for "offshore" in 40 CFR 98.449, Definitions, to clarify questions raised by stakeholders regarding the applicability of subpart RR to specific offshore geologic sequestration activities. The proposed definition was intended to clarify the meaning of "offshore" where it is used in the subpart RR regulations. We are finalizing the definition without changes in the final rulemaking.

23.2 Revisions to the definition of "offshore"

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 18

Comment Excerpt: EDF appreciates EPA's clarification regarding the applicability of subpart RR to offshore facilities, including the Outer Continental Shelf, and the inclusion of a definition for "Offshore" in section 98.449.[17] We again recommend that EPA collaborate with Department of the Interior in their forthcoming rulemaking to ensure that this requirement is appropriately accounted for in that process.

Footnotes

[17] "Offshore means seaward of the terrestrial borders of the United States, including waters subject to the ebb and flow of the tide, as well as adjacent bays, lakes or other normally standing waters, and extending to the outer boundaries of the jurisdiction and control of the United States under the Outer Continental Shelf Lands Act." 88 Fed. Reg. at 32,936.

Response: The EPA acknowledges the commenter's support of the proposed definition for "Offshore." See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 24 in section 23.1 of this document. With regard to coordination with the Department of Interior, the federal rulemaking process includes an interagency review process to ensure collaboration amongst federal agencies.

24.0 Comments on Subpart SS of Part 98

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 11

Comment Excerpt: Revised § 98.305(q) and § 98.456(u) both require the reporting of an ID number or other appropriate descriptor for each unique insulating gas. Gases mixed onsite will not have an ID number assigned by the supplier, so we assume the US EPA is referring to an ID number that is assigned by the user. If so, this should be clearly stated. Accordingly, the Coalition recommends the following revisions:

For ~~each unique~~ any insulating gas reported in paragraphs…of this section, an ID number assigned by the electric power system, or other appropriate descriptor that is unique to the reported insulating gas.

For each ID number or descriptor reported in paragraph…of this section, ~~for each unique insulating gas,~~ the name (as required in § 98.3(c)(4)(iii)(G)(1)) and weight percent of each gas in the insulating gas.

Response: The EPA agrees with the commenter and has incorporated changes into the final rule. The goal of the ID numbers and descriptors is to allow the reporter and EPA to identify the

name(s) and weight percent(s) of each fluorinated gas of each insulating gas reported, for both individual F-GHGs and F-GHG mixtures. To clarify the applicability of this requirement for those gases mixed onsite, the final rule clarifies that facilities must report an ID number or other appropriate descriptor that is unique to the reported insulating gas, and for each ID number or descriptor reported, the name and weight percent of each fluorinated gas in the insulating gas.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 12

Comment Excerpt: Insulating Gases Should be Defined as Gases with a GWP > 1. The proposed revisions would require reporters to track and report emissions of any fluorinated greenhouse gas or gas mixture used as an insulating gas or arc quenching gas in electrical systems. This definition ignores other potential gases that may come onto the market that are not fluorinated but still have a GWP potential. In order to track emissions of these gases, we recommend revising the definition of 'insulating gas' as follows: "Any gas with a global warming potential greater than 1 used as an insulating gas and/or arc quenching gas in electrical equipment." This approach also mirrors the reporting threshold implemented by the California Air Resources Board (CARB). Aligning the federal definition with state regulations would provide consistency for reporters to both the federal and state reporting rules[2].

Footnotes

[2] If EPA changes the proposed definition of 'insulating gas' to mirror the definition used by CARB then there is no need to update Table A–1 by adding Novec™ 5110, because Novec™ 5110 has a GWP < 1.

Response: See section III.Y.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Johnathan Stewart
Commenter Affiliation: National Electrical Manufacturers Association (NEMA) SF_6 & Alternatives Coalition
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0187-A1
Comment Excerpt Number: 13

Comment Excerpt: In several subsections of the proposed regulation, US EPA requires that measurement devices be precise as well as accurate.

"When speaking about the accuracy of a measurement, you are referring to the data's correctness. This means that an accurate instrument would provide measurements closest to the actual value or standard. Precision, on the other hand, is the ability of a device to provide you with consecutive measurements that are close to one another. An instrument can give extremely precise measurements that are not at all correct. Precision is directly related to the repeatability and reproducibility of your measurements."[3]

We recommend that the requirement for precision be removed since there is a much greater importance for accurate measurements than for repeatable measurements. Precision has little value if the measurements performed are not accurate.

Footnotes

[3] Metrology Terminology - Accuracy, Precision, Resolution: https://www.crossco.com/resources/articles/metrology-terminology-accuracy-precision-resolution/

Response: The EPA has responded to this comment based on similar comments to subpart DD of part 98. See section III.Q.2 of the preamble to the final rule for the EPA's response to this comment.

25.0 Comments on Subpart UU of Part 98

25.1 Revisions to subpart UU (Injection of Carbon Dioxide)

Commenter Name: Keith Tracy
Commenter Affiliation: Elysian
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0157-A1
Comment Excerpt Number: 4

Comment Excerpt: The definitions of the source categories in Subparts UU and VV could be clarified. For example, § 98.470(c) says that reporting under Subpart UU is "not required" if a report under Subpart VV is made. However, that provision does not preclude a reporter from reporting under both Subpart UU and Subpart VV

We believe the potential confusion could be reduced with a similar change to Subpart UU. Below is our suggested change to § 98.470 (after taking into account the proposed new paragraph (c)):

§ 98.470 Definition of the source category.

(a) The injection of carbon dioxide (CO_2) source category comprises any well or group of wells that inject a CO_2 stream into the subsurface.

(b) If you report under subpart RR of this part for a well or group of wells, you ~~are not required to~~ shall not report under this subpart for that well or group of wells.

(c) If you report under subpart VV of this part for a well or group of wells, you ~~are not required to~~ shall not report under this subpart for that well or group of wells.

(d) A facility that is subject to this part only because it is subject to subpart UU of this part is not required to report emissions under subpart C of this part or any other subpart listed in § 98.2(a)(1) or (a)(2).

Response: The EPA sought to clarify the reporting requirements in the 2023 Supplemental Proposal for facilities that permanently store CO_2 at enhanced oil recovery (EOR) facilities using CSA/ANSI ISO 27916:2019 (subpart VV). Specifically in regard to subpart UU, the EPA proposed amending 40 CFR 98.470, Definition of the source category, to state that reporters to subpart VV cannot report to subpart UU for the same well or group of wells that are reported to subpart VV. The EPA further proposed that a facility previously meeting the definition of the source category for subpart UU and then began using CSA/ANSI ISO 27916:2019 during the reporting year would be required to report under subpart UU for that portion of the reporting year before it began using CSA/ANSI ISO 27916:2019 and would be required to report under subpart VV for that portion of the year after it began using the CSA/ANSI ISO standard. The EPA is finalizing the subpart UU Definition of the source category in 40 CFR 98.470 as proposed in the supplemental rulemaking.

25.2 Revisions to the definition of source category (40 CFR 98.470)

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 24

Comment Excerpt: The Industry Trades support EPA's efforts to increase clarity and reduce the potential for double counting of reported emissions. In addition, the Industry Trades support EPA's proposal to revise the proposed text in 40 CFR 98.470(c) from "are not required to report" to "shall not report."

Response: The EPA acknowledges the commenter's support for the proposed revisions. See response to comment EPA-HQ-OAR-2019-0424-0157-A1, Excerpt 4 in section 25.1 of this document.

26.0 Comments on Subpart VV of Part 98

26.1 Revisions to add new subpart VV (Geologic Sequestration of Carbon Dioxide With Enhanced Oil Recovery Using ISO 27916)

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 3

Comment Excerpt: New subpart VV is a reasonable alternative to subpart RR reporting that provides flexibility to EOR operators and comports with other federal requirements. It should be finalized. In addition, EPA should clarify that Subpart VV reporting would be an acceptable alternative to Subpart RR reporting for regulatory regimes that permit carbon capture and storage (CCS) as a potential compliance mechanism for other CAA programs and regulations.

Facilities that conduct EOR currently have the option to either report basic information on CO_2 received under subpart UU (Injection of Carbon Dioxide) or report CO_2 sequestered under subpart RR (Geologic Sequestration of Carbon Dioxide). Facilities that conduct EOR are not required to report under subpart RR unless the owner/operator chooses to opt-in to subpart RR or the well is permitted as an Underground Injection Control (UIC) Class VI well. Most EOR operators are permitted as UIC Class II wells and choose to report under Subpart UU because it does not require a monitoring, reporting, and verification (MRV) plan, which EOR operators consider burdensome and expensive. This has historically limited the value of EOR sequestration as a compliance tool option for EGUs under CAA section 111 regulations because EPA would not accept Subpart UU reporting for compliance purposes. See, *e.g.*, Carbon Pollution Rule, 80 Fed. Reg. 64,510 (2015).

In addition, under Internal Revenue Service rules (IRS), to qualify for the section 45Q tax credit for secure geologic storage, qualified CO_2 must be stored in compliance with applicable requirements under subpart RR or CSA/ANSI ISO 27916:2019. Therefore, new subpart VV would enable more streamlined reporting of detailed information under the Greenhouse Gas Reporting Program (GHGRP) for EOR facilities and would be consistent with IRS rules for 45Q tax incentives. This consistency will support continued deployment of CCS, which is necessary to determine if this technology can be a viable option for reducing GHG emissions from a variety of sectors, including power generation.

Moreover, selling captured CO_2 from facilities can help make this control technology more affordable. As EPA considers control technologies that could serve as the basis for a best system of emission reduction (BSER) determination for any new section 111 rules for EGUs, the Agency should keep in mind that such determinations must consider the cost of achieving reductions. See CAA section 111(a), 42 U.S.C. § 7411(a) (The term standard of performance means a standard for emission of air pollutants which reflects the degree of emission limitation achievable through the best system of emission reduction (*taking into account the cost of achieving such reduction...*) (emphasis added)). Such technologies, like CCS, which currently significantly increase the costs of providing electricity to customers, which represents a barrier to be surmounted for determining that these technologies are adequately demonstrated as BSER for natural gas-based facilities at this time. Accordingly, EPA should take reasonable regulatory steps to promote the development of CCS and other technologies that reduce emissions, including providing alternatives to GHGRR reporting that can satisfy EPA's reporting goals while also promoting the use of necessary tax incentives and the cooperation of the EOR industry. In addition, EPA should make it clear in any future rulemaking that would permit CCS as a compliance option that reporting under Subpart VV would be equivalent to reporting under

Subpart RR and thus acceptable for purposes of demonstrating that CO_2 is stored. These are necessary, but not sufficient, steps toward making CCS available emissions reduction technology

Response: The EPA acknowledges the commenter's support for proposed subpart VV and is finalizing subpart VV as proposed in the 2023 Supplemental Proposal. Regarding comments specific to best system of emission reduction (BSER) determination for any new section 111 rules for EGUs, the EPA did not propose or request comment on revisions under section 111, therefore the comments are outside the scope of this rulemaking.

Commenter Name: Keith Tracy
Commenter Affiliation: Elysian
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0157-A1
Comment Excerpt Number: 1

Comment Excerpt: If there is an intent for data required by the ISO Standard to be reported under the GHGRP, Subpart UU is deficient. The proposed Subpart VV appropriately requires ISO EOR Operations data to be disclosed at much more equivalent basis as EOR operations would have to report if they opt into Subpart RR. As a result, Subpart VV tends to level the playing field with respect to the GHGRP because the result of the proposed rules is that EOR operations under both Subpart RR and the ISO Standard EOR will be held to generally the same reporting level requirements. This seems appropriate, especially since a primary purpose for an EOR operation to adopt the ISO Standard or to opt into Subpart RR is the same: IRS Section 45Q tax credits.

Response: The EPA acknowledges the commenter's support for proposed subpart VV and is finalizing subpart VV as proposed in the 2023 Supplemental Proposal (88 FR 32852, May 22, 2023).

Commenter Name: George D. Baker
Commenter Affiliation: Energy Advance Center (EAC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0205-A1
Comment Excerpt Number: 1

Comment Excerpt: EAC has supported the development of an optional, more transparent, and publicly accessible forum for GHG reporting related to EOR operations currently conducted pursuant to Subpart UU and for which the operator applies for 45Q carbon sequestration tax credits. Upon review of the newly proposed Subpart VV, EAC concludes that the proposed Subpart VV accommodates that objective for a new, alternative GHG reporting option.

The Subpart VV proposal provides suitable transparency in satisfactorily reflecting the relevant elements required by CSA/ANSI ISO 27916:19, which governs EOR operations conducted to qualify for 45Q tax credits. Any EOR operator claiming 45Q tax credits and going through the process to comply with the CSA/ANSI ISO 27916:19 requirements should be able to comply with Subpart VV without further considerable burden.

Response: The EPA acknowledges the commenter's support. See response to comment EPA-HQ-OAR-2019-0424-0157-A1, Excerpt 1.

Commenter Name: Jessie Stolark
Commenter Affiliation: Carbon Capture Coalition (the Coalition)
Commenter Type: Other
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0206-A1
Comment Excerpt Number: 2

Comment Excerpt: In 45Q regulations issued by the IRS in 2021 following the enactment of the 2018 FUTURE Act, the agency made the determination that they do not have the statutory authority to publicly disclose relevant documentation by taxpayers reporting under ISO 27916. Since the publication of 45Q regulations in early 2021, the Coalition has continued to support requiring public disclosure of relevant documentation by taxpayers relying on this alternative ISO pathway. To this end, the Coalition supports EPA creating Subpart VV — geologic sequestration of carbon dioxide with enhanced oil recovery using ISO 27916, as it maintains the integrity of the ISO program, while harmonizing the reporting information that is publicly disclosed for both Subpart RR and ISO 27916.

Response: The EPA acknowledges the commenter's support. See response to comment EPA-HQ-OAR-2019-0424-0157-A1, Excerpt 1.

Commenter Name: William Swetra
Commenter Affiliation: Oxy Low Carbon Ventures (OLCV)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0217-A1
Comment Excerpt Number: 1

Comment Excerpt: We support the EPA's efforts to introduce subpart VV (VV) as an option for quantifying geologic sequestration in association with enhanced oil recovery operations using the CSA/ANSI ISO 27916:2019 (ISO CO_2-EOR Standard). The adoption of VV will cure reporting and transparency shortcomings that currently exist with respect to the ISO CO_2-EOR Standard and provide a more accurate measure of stored anthropogenic carbon dioxide (CO_2) in the EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks (GHG Emissions and Sinks Inventory) from CO_2-EOR operations.

CO_2-EOR operations that utilize the ISO CO_2-EOR Standard for quantifying the amount of CO_2 geologically stored do not currently report those stored emissions in the GHG Emissions and Sinks Inventory. These stored volumes or "negative emissions" should be reported to ensure a complete GHG Emissions and Sinks Inventory. Furthermore, reporting these emissions reductions quantified using the ISO CO_2-EOR Standard enhances transparency and will build public trust in geologic sequestration as a valid CO_2 emissions mitigation pathway.

Response: The EPA acknowledges the commenter's support. See response to comment EPA-HQ-OAR-2019-0424-0157-A1, Excerpt 1.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 49
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: The Industry Trades support EPA efforts to revise the greenhouse gas reporting program to enable collection of a data set of CO_2 injected and permanently sequestered. This data may enable a better estimate of total CO_2 injected and permanently sequestered annually for the national greenhouse gas inventory. A more complete assessment will allow EPA to include carbon capture and sequestration as a CO_2 sink and bring the US national inventory into greater alignment with IPCC standards.

Response: The EPA acknowledges the commenter's support. See response to comment EPA-HQ-OAR-2019-0424-0157-A1, Excerpt 1.

26.2 Comments on definition of the source category and requesting clarity of applicability of subparts RR, UU, and VV

Commenter Name: George D. Baker
Commenter Affiliation: Energy Advance Center (EAC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0205-A1
Comment Excerpt Number: 3

Comment Excerpt: EAC agrees with EPA's express inclusion of tertiary recovery operations for natural gas in Subpart VV. The accommodation of natural gas properly extends the purpose of the Subpart to track associated storage of CO: in a tertiary recovery project.

Response: The EPA acknowledges the commenter's support. See response to comment EPA-HQ-OAR-2019-0424-0157-A1, Excerpt 1 in section 26.1 of this document.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 50
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: The proposed subpart VV should not be viewed in the context of the 45Q tax credit for carbon dioxide sequestration as a method of providing transparency for IRS operations. Any justification that the reporting program would serve to provide transparency relating to the tax credit for carbon dioxide sequestration would be an overstatement of the role of the reporting program and EPA's authority therein. We appreciate EPA's effort to include such data without requiring additional reporting elements or methodologies beyond those provided by CSA/ANSI ISO 27916:2019, which many operators already utilize as a result of IRS regulations. EPA should continue to look to existing methodologies that may be leveraged to provide additional greenhouse gas data rather than creating new and possibly duplicative programs.

Response: The EPA acknowledges the commenter's support. See response to comment EPA-HQ-OAR-2019-0424-0157-A1, Excerpt 1 in section 26.1 of this document.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 25

Comment Excerpt: EDF strongly supports EPA's efforts to cure a GHGRP gap created by the Treasury's adoption of the ISO Standard (CSA/ANSI ISO 27916:2019) as a demonstration of secure storage alternative for CO_2-EOR operators claiming 45Q credits.[227] We also emphasize the importance of ensuring that those choosing the ISO pathway beheld to a similar standard of transparency and reporting as those reporting under subpart RR. EPA should modify transparency and reporting standards as appropriate to account for the specifics of the ISO standard.

> Specifically, we are concerned that vague and potentially contradictory language used in the preamble as well as the draft regulatory language may lead to misinterpretation. In particular, the draft regulatory text appears to allow operators who use the ISO pathway to demonstrate secure storage to continue using or opt to use subpart UU for GHGRP

reporting. We believe this language may conflict with EPA's stated purpose in the preamble for the adoption of subpart VV. EDF recommends that EPA: 1) clarify its intent, 2) clarify the proposed regulatory text, and 3) clarify the preamble language.

1. Clarify intent: EPA should make clear in the preamble, and where appropriate in regulatory text, that any sequestration project obtaining tax credits or otherwise permitted or claiming to permanently store captured anthropogenic carbon dioxide must report sequestered volumes under either subpart RR or subpart VV, without exception. This is necessary for transparency and accuracy of the GHGRP's accounting of volumes securely sequestered. Neither subpart UU nor any other existing GHGRP subpart is acceptable for this purpose given the lack of focus on ensuring long-term secure storage.

2. Clarify regulatory language: The newly proposed subpart VV language appears to allow CO_2-EOR projects using the ISO standard to demonstrate secure storage to continue to report under subpart UU. We believe this is unintentional, as continued allowance of subpart UU for these entities would circumvent the purpose of adopting a specialized subpart VV. Accordingly, EDF proposes the following revisions (in red) to the proposed language defining the subpart VV source category in § 98.480:

   (a) This source category pertains to carbon dioxide (CO_2) that is injected in enhanced recovery operations for oil and other hydrocarbons (CO_2-EOR) ~~in which all of the following apply: (1)~~ if [y]ou are using the International Standards Organization (ISO) standard designated as CSA/ANSI ISO 27916:2019, "Carbon Dioxide Capture, Transportation and Geological Storage —Carbon Dioxide Storage Using Enhanced Oil Recovery (CO_2-EOR)" (CSA/ANSI ISO 27916:2019) incorporated by reference, see § 98.7) as a method of quantifying geologic sequestration of CO_2 in association with EOR operations.

~~(2) You are not reporting under subpart UU of this part.~~

~~(3) You are not reporting under subpart RR of this part.~~

   (b) This source category does not include wells permitted as Class VI under the Underground Injection Control program.

   (c) If you are subject to only this subpart, you are not required to report under subpart RR or UU of this subpart and you are not required to report emissions under subpart C of this part or any other subpart listed in § 98.2(a)(1) or (a)(2).

   In § 98.483, calculating CO_2 geologic sequestration, (d) should read:

   (d) You must calculate the total mass of CO_2 loss from project operations (mloss operations) in the reporting year as specified in Equation VV–2 of this section.

3. Clarify preamble text: In order to remove ambiguity in the preamble, EDF proposes these edits to the following language at 87 Fed. Reg. 36,936:

   The facilities affected by the proposed subpart include facilities that are currently reporting under subpart UU and that do not currently report amounts of CO_2 sequestered. The EPA is proposing no threshold for the proposed subpart VV so that all EOR facilities that quantify CO_2 sequestration using the CSA/ANSI ISO 27916:2019 standard ~~and that do not report under subpart RR would have the option to either~~ report under the proposed subpart VV ~~or would otherwise continue to report under subpart UU.~~ For these reasons, we do not anticipate that the new subpart would increase the number of facilities subject to the GHGRP. ~~Further, it is difficult to predict how many injection facilities would choose to report using the ISO standard in lieu of continuing to report under subpart UU.~~

Response: The EPA agrees with the commenter that the original proposed regulatory text and preamble language of the 2022 Data Quality Improvements Proposal was not clear in addressing applicability for facilities that conduct geologic sequestration of carbon dioxide with enhanced oil recovery using CSA/ANSI ISO 27916:2019. Based on comments received on the proposed rulemaking, the EPA sought to clarify the reporting requirements in the 2023 Supplemental Proposal for facilities that use CSA/ANSI ISO 27916:2019 (subpart VV). The supplemental proposal clarified that facilities using CSA/ANSI ISO 27916:2019 would be required to report under subpart VV unless they report under subpart RR. In the 2023 Supplemental Proposal, reference to subpart UU was removed completely from 40 CFR 98.480, Definition of the source category, for subpart VV. Furthermore, the EPA also proposed corresponding amendments to 40 CFR 98.470, Definition of the source category for subpart UU, to state that reporters to subparts RR or VV cannot report to subpart UU for the same well or group of wells that are reported to subparts RR and VV. For additional clarity, the EPA also proposed that a facility previously meeting the definition of the source category for subpart UU and then began using CSA/ANSI ISO 27916:2019 during the reporting year would be required to report under subpart UU for that portion of the reporting year before it began using CSA/ANSI ISO 27916:2019 and would be required to report under subpart VV for that portion of the year after it began using the CSA/ANSI ISO standard. We believe this clarifies the applicability of reporters using CSA/ANSI ISO 27916:2019, and today the EPA is finalizing 98.480 as it was proposed in the supplemental rulemaking.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 17

Comment Excerpt: The Alliance supports the addition of subpart VV for accurately accounting for sequestration efforts in EOR operations. Ultimately, as more and more efforts are made to

inject, store, and capture CO_2 permanently, it will be important for EPA to properly track that information. However, the proposed rule contains ambiguity between the preamble and the proposed rule language as to whether operators choosing to demonstrate secure geologic storage via ISO 27916 can choose between reporting under RR, UU or VV. In either case, in order for EPA to maintain an accurate and complete measure of stored anthropogenic CO_2 in the Inventory of U.S. Greenhouse Gas Emissions and Sinks, CO_2-EOR operators choosing to demonstrate secure storage via ISO 27916 should report under RR or VV, as UU is the amount of CO_2 brought onsite - not the amount of anthropogenic CO_2 geologically stored in CO_2-EOR operations.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: Hannah Turner
Commenter Affiliation: Carbon Utilization Research Council (CURC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0252-A2
Comment Excerpt Number: 1

Comment Excerpt: Facilities that conduct EOR currently have the option to either report basic information on CO_2 received under subpart UU (Injection of Carbon Dioxide), or report CO_2 sequestered under subpart RR (Geologic Sequestration of Carbon Dioxide). Facilities that conduct EOR are not required to report under subpart RR unless the owner or operator chooses to opt-in to subpart RR, or the well is permitted as an Underground Injection Control (UIC) Class VI well. The proposal would allow facilities that use the standard CSA/ANSI ISO 27916:2019 for quantifying geologic sequestration of CO_2 to similarly have the option to report under the proposed subpart VV instead of subpart UU. Facilities that conduct EOR would be required to report information on CO_2 received under subpart UU, or they can choose to opt-in to either subpart RR or the new subpart VV to quantify amounts of CO_2 that are geologically sequestered.

Facilities subject to subpart RR are required to develop and implement an EPA-approved monitoring, reporting, and verification (MRV) plan and report annually the amount of CO_2 received, the data used to calculate this amount, the source of the received CO_2 (if known), the mass balance equation inputs (amounts of CO_2 injected, CO_2 produced, CO_2 emitted by surface leakage, CO_2 emitted from equipment leaks and vented CO_2 emissions), the data used to calculate the inputs, and the amount of CO_2 sequestered. Like subpart RR, subpart UU requires facilities to report the quantity of CO_2 received, the data used to calculate this amount, and the source of the received CO_2 (if known). However, subpart UU does not require an MRV plan or the submission of an annual monitoring report and does not provide an accounting framework of the amount of CO_2 sequestered.

Under Treasury Department and Internal Revenue Service rules, to qualify for the section 45Q tax credit for secure geologic storage, qualified CO_2 must be stored in compliance with applicable requirements under subpart RR or CSA/ANSI ISO 27916:2019. Therefore, CURC

appreciates the addition of the new subpart VV to enable more streamlined reporting of detailed information under the Greenhouse Gas Reporting Program (GHGRP) for EOR facilities. The proposal allows reporters that choose CSA/ANSI ISO 27916:2019 for purposes of the section 45Q tax credit to continue reporting under subpart UU of the GHGRP if they choose not to report under subpart RR. CURC proposes EPA require entities claiming 45Q tax credits that conduct EOR report under either subpart RR or subpart VV (CSA/ANSI ISO 27916:2019).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 4

Comment Excerpt: PBPA supports the addition of subpart VV for accurately accounting for sequestration efforts in EOR operations. Ultimately, as more and more efforts are made to inject, store, and capture CO_2 permanently, it will be important for EPA to properly track that information. However, within the proposal, there is ambiguity between the preamble and the proposed rule language as to whether operators choosing to demonstrate secure geologic storage via ISO 27916 can choose between reporting under RR, UU or VV. In either case, to provide consistency and accuracy of data, if an operator is using ISO 27916 for the purposes of claiming a 45Q credit, subpart UU should not remain available as a reporting mechanism, and instead those operations should be reported under the new subpart VV.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: Jessie Stolark
Commenter Affiliation: Carbon Capture Coalition (the Coalition)
Commenter Type: Other
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0206-A1
Comment Excerpt Number: 3

Comment Excerpt: With the addition of Subpart VV, the final regulations should make clear that CO_2-EOR operators electing to use ISO 27916 no longer have the option to report under subpart UU and instead are reporting under the newly established Subpart VV. Subpart UU, used for reporting CO_2 injected, is not equivalent to demonstrating secure geologic storage, which is the purpose of the proposed Subpart VV.

Language appearing in the preamble of the draft regulations may create the impression that CO_2-EOR operators have the option of continuing to report under Subpart UU (emphasis added):

- "The EPA is proposing no threshold for the proposed subpart VV so that all EOR facilities that quantify CO_2 sequestration using the CSA/ANSI ISO 27916:2019 standard and that do not report under subpart RR would have the option to either report under the proposed subpart VV, or would otherwise continue to report under subpart UU. For these reasons, we do not anticipate that the new subpart would increase the number of facilities subject to the GHGRP. Further, it is difficult to predict how many injection facilities would choose to report using the ISO standard in lieu of continuing to report under subpart UU."

Additionally, the definition of the source category for Subpart VV (Section 98.480(a)(2)) could be interpreted that CO_2-EOR operators may continue to use Subpart UU for purposes of GHGRP reporting, and the Coalition suggests that subsection (2) be deleted (emphasis added):

This source category pertains to carbon dioxide (CO_2) that is injected in enhanced recovery operations for oil and other hydrocarbons (CO_2-EOR) in which all of the following apply:

(1) You are using the International Standards Organization (ISO) standard designated as CSA/ANSI ISO 27916:2019 (incorporated by reference, see § 98.7) as a method of quantifying geologic sequestration of CO2 in association with EOR operations.

(2) You are not reporting under subpart UU of this part.

The above language in the draft regulations may create confusion on this point, and the Coalition suggests that EPA clarify that CO_2-EOR operators must now report under Subpart VV in the final regulations.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: William Swetra
Commenter Affiliation: Oxy Low Carbon Ventures (OLCV)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0217-A1
Comment Excerpt Number: 3

Comment Excerpt: We further suggest EPA clarify that operators choosing to quantify geologic storage of anthropogenic CO_2 via the ISO CO_2-EOR Standard report under only one subpart, with VV being the preferred pathway because it is a more robust reporting pathway than subpart UU (UU). However, in the proposed rule, ambiguity exists between the preamble and rule language at § 98.480 as to whether operators choosing to demonstrate secure geologic storage via the ISO CO_2-EOR Standard can continue to report under UU. In the final rule, we suggest EPA explicitly state that UU does not remain a reporting pathway for CO_2-EOR operators choosing the ISO CO_2-EOR Standard to quantify permanent geologic storage of anthropogenic CO_2.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 28

Comment Excerpt: We commend EPA for creating a reporting pathway for entities using the ISO 27916:2019 standard to quantify CO_2 stored in association with CO_2-EOR operations. Creation of this pathway is a necessary step for supporting robust monitoring and verification of CO_2 stored. In fact, compliance with the ISO standard necessarily entails reporting much of the data generated under the ISO standard to the "competent governmental entity or entities with legal power to regulate or permit CO_2-EOR" and any associated storage of CO_2. [94] For the U.S., that entails reporting those data elements to EPA.[95] Thus, EPA must provide a means to report the relevant information in the ISO standard in order for entities to formally comply with its own terms.

However, EPA's language, as proposed, could be read by operators to imply that CO_2-EOR operators may be able to remain under subpart UU, even while electing to quantify associated CO_2 storage using the ISO methodology for purposes of receiving 45Q tax credits. While the reporting threshold in proposed 40 C.F.R. § 98.481(a) is clear that any project that uses the ISO standard to quantify CO_2 stored must report under subpart VV, the inclusion criteria in proposed 40 C.F.R. § 98.480(a) indicate that a project that remains under subpart UU would not be required to report. This ambiguity presents the risk that a CO_2-EOR operator might choose to report under subpart UU but still quantify CO_2 stored using the ISO methodology and receive 45Q tax credits without the transparency afforded by reporting under subpart RR or proposed subpart VV. This also presents the risk that CO_2-EOR operators could claim compliance with the ISO 27916 standard for purposes of the 45Q tax credit without formal compliance with that standard's terms regarding reporting to the "authority," *i.e.*, EPA.

To mitigate this risk, EPA should modify its proposed inclusion criteria for reporting under subpart VV to clarify that, if an entity chooses to quantify CO_2 stored using the ISO 27916:2019 methodology for any purpose (*e.g.*, for the purpose of seeking 45Q tax credits), they must then report under subpart VV. Removing proposed 40 C.F.R. § 98.480(a)(2) ("[y]ou are not reporting under subpart UU of this part") would be sufficient to clarify this. Sources should be able to elect to remain reporting under subpart UU only if they are not seeking to quantify CO_2 storage in association with their EOR operations.

Footnotes

[94] International Organization for Standardization, ISO 27916:2019 § 3.3 (definition of "authority"); see, *e.g.*, ISO 27916:2019 §§ 4.3, 4.4, 9.1, 10.1 (sections specifying documentation or other information to be provided to the authority).

[95] EPA retains the legal power to regulate CO_2-EOR, under authorities including the UIC program, even if that authority is delegated to the states through the state primacy program. EPA also has authority to, and does, regulate CO_2 storage in association with EOR. See, *e.g.*, 40 C.F.R. §§

60.5555(f), 98.426(h) (New Source Performance Standards for greenhouse gases using carbon storage in association with EOR).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: Keith Tracy
Commenter Affiliation: Elysian
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0157-A1
Comment Excerpt Number: 2

Comment Excerpt: We believe that ISO EOR Operations should report under no more than a single subpart. It appears that the proposed rules, taken together with the existing rules left unmodified by the proposed rules, may create some confusion regarding which subparts are applicable to ISO EOR Operations. There is a concern that, if the proposed rules were adopted, the GHGRP leaves open the possibility that an operator of ISO EOR Operations may have the ability or opportunity to report under multiple subparts. The definitions of the source categories in Subparts UU and VV could be clarified. For example, § 98.470(c) says that reporting under Subpart UU is "not required" if a report under Subpart VV is made. However, that provision does not preclude a reporter from reporting under both Subpart UU and Subpart VV. In the interest of preserving the integrity of the data housed in the GHGRP database, we would support requirements to preclude reporters from reporting the same CO_2 volumes under Subparts RR, UU and VV. We believe the definition of the source category for each subpart should, when taken together, make clear that ISO EOR Operations can only report under Subpart VV.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: Keith Tracy
Commenter Affiliation: Elysian
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0157-A1
Comment Excerpt Number: 3

Comment Excerpt: The language of the proposed rule in § 98.480(a)(2) and (3) could add to this potential confusion. To avoid this result, we would suggest that the proposed rule at § 98.480 be revised as follows:

§ 98.480 Definition of the source category.

(a) This source category pertains to carbon dioxide (CO_2) that is injected in enhanced recovery operations for oil and other hydrocarbons (CO_2-EOR) ~~in which all of the following apply:~~

~~(1) You~~are using the International Standards Organization (ISO) standard designated as CSA/ANSI ISO 27916:2019 (incorporated by reference, see § 98.7) as a method of quantifying geologic sequestration of CO_2 in association with EOR operations.

(2) You are not reporting under subpart UU of this part.

(3) You are not reporting under subpart RR of this part.

(b) This source category does not include wells permitted as Class VI under the Underground Injection Control program. This source category does not include a well or group of wells reported under subpart RR or subpart UU.

(c) If you are subject to only this subpart, you are not required to report emissions under subpart C of this part or any other subpart listed in § 98.2(a)(1) or (a)(2).

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 51
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: EPA must clarify its intent to introduce subpart VV as a required reporting pathway for operators employing the CSA/ANSI ISO 27916:2019 methodology or as an option for reporters to choose between subpart UU and subpart VV. In the preamble to the proposed rulemaking, EPA suggested that the use of subpart VV as a reporting category would be at the discretion of the operator, stating "facilities that conduct EOR would be required to report basic information on CO: received under subpart UU, or they could choose to opt-in to either subpart RR or the new subpart to quantify amounts of CO_2 that are geologically sequestered." (87 Fed. Reg. 37016) This interpretation of the language in the preamble is confirmed later when EPA asserts that they do not anticipate the proposed subpart would expand existing coverage, and that "These facilities will also retain the option to continue to report under existing subpart UU with no changes." (87 Fed. Reg. 37024)

The above language is not reflected in the proposed regulatory language provided by EPA. EPA's proposed language would require all reporters using the CSA/ANSI ISO 27916:2019 methodology to report under proposed subpart VV, eliminating the optionality referenced in the preamble. Under the proposed reporting threshold for subpart VV, EPA has currently written "(a) You must report under this subpart if your CO_2-EOR project uses CSA/ANSI ISO 27916:2019 (incorporated by reference, see § 98.7) as a method of quantifying geologic sequestration of CO_2 in association with CO_2-EOR operations."[5] This does not agree with the language included in the preamble to the proposed rule.

Footnotes

[5] EPA Redline page 960 § 98.481.

Response: See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: George D. Baker
Commenter Affiliation: Energy Advance Center (EAC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0205-A1
Comment Excerpt Number: 2

Comment Excerpt: In supporting the Subpart VV proposal, EAC emphasizes that such support is expressly premised on the voluntary/optional nature of Subpart VV. The newly proposed Subpart VV is envisioned as being a supplementary alternative to reporting under existing Subparts UU and RR. The proposed language of Subpart VV's Section 98.480 specifies that reporting under that new subpar tis reserved to projects operated in accord with CSA/ANSI ISO 27916:19 for which the operator does not report under either Subparts UU or RR. As such, EPA's proposal does not disrupt the long-standing choice EOR operators have had and will continue to have to comply with either Subpart UU or opt-in to Subpart RR. In describing that voluntary character of Subpart VV, EPA states:

...the EPA is proposing a new source category—subpart VV—related to the option for reporting of incidental CO_2 storage associated with EOR based on the CSA/ANSI ISO 27916:2019 standard. Specifically, facilities that conduct EOR would be required to report basic information on CO_2 received under subpart UU, or they could choose to opt-in to either subpart RR or the new subpart [VV] to quantify amounts of CO, that are geologically sequestered. 87 Fed Reg at 37016. (Italics added.)

EAC notes that EPA's serial use of the italicized word "or" in the above-quoted language from the proposal's preamble clearly indicates not only the existence of a choice provided to the reporting entity but connotes that reporting is to be done under only one of those optional Subparts. In EAC's judgment, EPA has clearly and properly conveyed that reporting entities are not to report under more than one of those Subparts.

Response: The EPA clarified its intent with respect to subpart VV in the 2023 Supplemental Proposal for facilities using CSA/ANSI ISO 27916:2019. See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

Commenter Name: Not provided
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0312-A1
Comment Excerpt Number: 19

Comment Excerpt: We strongly support EPA's proposed changes to subpart VV. EPA has resolved ambiguous and contradictory language around the applicability of subpart VV in the agency's previous draft regulation.[18] EPA has clarified in reproposed 40 C.F.R. § 98.480 (Definition of Source Category, subpart VV) that CO_2-EOR projects using CSA/ANSI ISO 27916:2019 ("ISO standard") to demonstrate secure storage shall not continue to report under subpart UU, and must report under subpart VV.[19]

Newly proposed 40 C.F.R. § 98.481(c) requires operators, who previously reported under subpart UU and later began using the ISO standard, to report under subpart VV for portions of the transition year that the ISO pathway is utilized, and continue to do so thereafter.[20] Proposed changes to 40 C.F.R. § 98.470 (Definition of the source category, subpart UU) contain similar language that is consistent with the amendments to subpart VV.[21]

These amendments make clear that any sequestration project obtaining tax credits or otherwise permitted or claiming to permanently store captured anthropogenic carbon dioxide must report sequestered volumes under either subpart RR or subpart VV, but not subpart UU. This change is necessary to cure a GHGRP gap created by the Treasury's adoption of the ISO Standard (CSA/ANSI ISO 27916:2019) as a demonstration of secure storage alternative for CO_2-EOR operators claiming 45Q credits. We emphasize the importance of ensuring that those choosing the ISO pathway be held to a similar standard of transparency and reporting as those reporting under subpart RR. EPA should modify transparency and reporting standards as appropriate to account for the specifics of the ISO standard.

Footnotes

[18] See generally EDF Comments on Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule, 87 Fed. Reg. 36,920 at 75-77 (Oct. 6, 2022), https://blogs.edf.org/energyexchange/wp-content/blogs.dir/38/files/2022/10/EDF-GHGRP-Comments-10.6.2022-Final.pdf.

[19] "Under this proposal, the EPA would not require that facilities quantify geologic sequestration of CO_2 in association with EOR operations through the use of the CSA/ANSI ISO 27916:2019 method; however, if the facility elects to use the CSA/ANSI ISO 27916:2019 method for quantifying geologic sequestration of CO_2 in association with EOR operations, then the facility would be required under the GHGRP to report under subpart VV (rather than reporting under subpart UU or opting into subpart RR). More specifically, the proposed rule would require facilities quantifying the mass of CO_2 geologically sequestered using CSA/ANSI ISO 27916:2019 to report the quantity of CO_2 sequestered under subpart VV and to meet all requirements of subpart VV. It is our intention that subpart VV would apply to facilities that use CSA/ANSI ISO 27916:2019 for the purpose of demonstrating secure geologic storage." 88 Fed. Reg. at 32,884.

[20] "The proposed text clarifies that CO_2-EOR projects previously reporting under subpart UU that begin using CSA/ANSI ISO 27916:2019 part-way through a reporting year must report under subpart UU for the portion of the year before CSA/ANSI ISO 27916:2019 was used and report under subpart VV for the portion of the year once CSA/ANSI ISO 27916:2019 began to be used and thereafter. After the initial transition year, these facilities would be required to report under subpart VV only, until the requirements to discontinue reporting are met." 88 Fed. Reg. at 32,885.

[21] "We are also proposing an additional sentence in paragraph 98.470(c) to clarify that CO_2-EOR projects that become subject to subpart VV during a reporting year must report under subpart UU for the portion of the reporting year before they began using CSA/ANSI ISO 27916:2019 and under subpart VV for the portion after they began using CSA/ANSI ISO 27916:2019. Facilities shall not report CO_2 under subparts VV and UU in a way that is duplicative, but it is possible that facilities would report under both subparts during the reporting year in which they transition to using CSA/ANSI ISO 27916:2019." Id. at 32,884.

Response: The EPA acknowledges the commenter's support for the proposed revisions. See response to comment EPA-HQ-OAR-2019-0424-0241-A1, Excerpt 25.

26.3 Proposed calculation, monitoring, quality assurance, and missing data procedures adopted from CSA/ANSI ISO 27916:2019

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 52
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: EPA should revise the proposed regulatory language under subpart VV to afford operators the opportunity to provide data that better reflects the methodology for reporting CO_2-loss under subpart RR and the specific focus of EPA's GHG Reporting Program of reporting GHG emissions to the atmosphere. Under subpart RR, reporters are required to report the mass of CO_2 emitted to the atmosphere by surface leakage (40 CFR 98.442(d)). However, the CSA/ANSI ISO 27916:2019 methodology as proposed to be adopted by EPA, would require reporting of "the mass of CO2 loss from the EOR complex."[6] This reporting element, as proposed, would provide EPA with data that is not specifically related to loss of CO_2 to the atmosphere. Instead, this element would report the migration of CO_2 in any direction out of the defined storage complex, regardless of any further migration to the surface or emission to the atmosphere. Inclusion of all CO_2 migrating out of the defined storage complex could underestimate the net CO_2 stored in association with EOR operations if any volume of CO_2 migrates outside of the storage complex. We recommend that EPA revise the proposed regulatory language to enable operators to better address the focus of the GHG reporting program (atmospheric emissions) and to better align with the reporting requirements of subpart RR. This could be achieved by revising the definition of $M_{loss\ EOR\ complex}$ as "the total annual mass of CO_2 loss from the EOR complex (See Clause 8.4.6) or emitted by surface leakage in the reporting year (40 CFR98.443(e)), metric tons." This revision and associated supporting changes are reflected below:

"§ 98.482 GHGs to report... (e) The mass of CO_2 loss from the EOR complex as defined under $M_{loss\ EOR\ complex}$ in Equation VV–1."

"§ 98.483 Calculating CO_2 geologic sequestration...

You must calculate CO_2 sequestered using the following quantification principles from Clause 8.2 of CSA/ANSI ISO 27916:2019 (incorporated by reference, see § 98.7), unless otherwise indicated.

(a) You must calculate the mass of CO_2: stored in association with CO_2-EOR (M_{stored}) in the reporting year by subtracting the mass of CO_2 loss from operations and the mass of CO_2 emitted by surface leakage or loss from the EOR complex from the total mass of CO_2 input (as specified in Equation VV–1 of this section).

$M_{stored} = M_{input} — M_{loss\ operations} — M_{loss\ EOR\ complex}$ (Equation VV–1)

Where.... $M_{loss\ EOR\ complex}$ = the total annual mass of CO_2 loss from the EOR complex (see Clause 8.4.6) or emitted by surface leakage in the reporting year (40 CFR 98.443(e)), metric tons.

"§ 98.486 Data reporting requirements. In addition to the information required by § 98.3(c), the annual report shall contain the following information, as applicable:

(f) the total mass of CO_2 emitted by surface leakage or loss from the EOR complex ($M_{loss\ EOR\ complex}$)."

Footnotes

[6] EPA Redline page 961 § 98.482.

Response: The EPA acknowledges the commenters' suggested edits. The EPA proposed adopting the requirements of CSA/ANSI ISO 27916:2019 by reference to ensure clear and consistent reporting requirements for EOR facilities using the standard. Finalizing the rule with equations that are different from those in the ISO standard could create an additional reporting burden and confusion for facilities. Furthermore, leakage or loss from the storage complex could lead to eventual surface leakage which should not be included in a storage total. We are, therefore, finalizing 40 CFR 98.482(e), 98.483, 98.483(a), and 98.486(f) as proposed in the 2023 Supplemental Proposal without the commenter's proposed changes.

26.4 Proposed requirement to provide the ISO Enhanced Oil Recovery (EOR) Operations Management Plan (OMP)

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 26

Comment Excerpt: The most significant difference between subpart RR and CSA/ANSI ISO 27916:2019 is related to public transparency. EPA publishes final decisions under subpart RR on its website, such as whether to approve an MRV plan or request for discontinued reporting. Any interested person can appeal subpart RR final decisions to EPA's Environmental Appeals Board. In addition, EPA also verifies the data submitted in annual GHGRP reports, including annual

monitoring reports submitted under subpart RR, and publishes non-confidential data on the EPA website. In contrast, facilities that follow CSA/ANSI ISO 27916:2019 are not currently subject to requirements related to public reporting and transparency of amounts stored and associated documentation. The ISO standard itself, as relied on by the Internal Revenue Service, does not contain the requirements for public disclosure and transparency of information necessary to allow the public to review the adequacy of the demonstration of secure geological storage.

With these factors in mind, EDF generally supports EPA's proposal to require reporting and documentation in subpart VV that aligns with the documentation envisioned in the ISO standard. This would provide transparent information to EPA and the public to track the value chain of CO_2 supply and disposition.

Response: The EPA acknowledges the commenter's support of proposed subpart VV. See response to comment EPA-HQ-OAR-2019-0424-0157-A1, Excerpt 1 in section 26.1 of this document.

Commenter Name: George D. Baker
Commenter Affiliation: Energy Advance Center (EAC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0205-A1
Comment Excerpt Number: 9

Comment Excerpt: EAC notes that the requirement for filing the CSA/ANSI ISO 27916:19-compliant management plan with EPA is analogous to the similar requirement under Subpart RR relating to the "monitoring, reporting, and verification" (MRV) plan. While unlike the situation with Subpart RR which requires approval by EPA of the MRV plan, EOR projects that qualify for 45Q tax credits must be certified by a licensed third-party engineer which, in EAC's view, comparably provides the public confidence that the project comports with the CSA/ANSI ISO 27916:19 requirements.

Response: The EPA acknowledges the commenter's support of proposed subpart VV. We are finalizing the rules as proposed.

Commenter Name: Jessie Stolark
Commenter Affiliation: Carbon Capture Coalition (the Coalition)
Commenter Type: Other
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0206-A1
Comment Excerpt Number: 5

Comment Excerpt: For the purposes of Subpart VV, operators reporting to EPA must provide a copy of information reported under ISO 27916, which includes the independent engineer or

geologist's certification of the mass balance calculations as well as information on monitoring and containment assurance. The preamble of the proposed regulations notes "the EPA is not proposing EPA approval of a third party approved and certified EOR OMP and documentation," and the Coalition supports this approach in the final regulations.

Response: The EPA acknowledges the commenter's support. See response to comment EPA-HQ-OAR-2019-0424-0205-A1, Excerpt 9.

Commenter Name: Keith Tracy
Commenter Affiliation: Elysian
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0157-A1
Comment Excerpt Number: 5

Comment Excerpt: We believe the proposed rule regarding the EOR Operations Management Plan should be modified to require additional details and more complete information regarding previously injected CO_2 volumes. As proposed, § 98.488(b)(5) requires reporting a single value of all previously-injected CO_2 volumes in the ISO EOR Operations. In some instances, that single value could constitute the sum of CO_2 volumes from many years (if not decades) of prior CO_2 injection. While we support the reporting of previously-injected volumes, we believe annualized data should be reported. This would render the reported data more in line with the reporting intervals of most all other data in the GHGRP database. As a result, we would suggest the following change to the proposed § 98.488(b)(5):

> (5) The total mass<u>, by calendar year,</u> of previously injected CO_2 (if any) within the EOR complex at the beginning of the CO_2-EOR project (see Clause 8.5 and Annex B).

Response: The EPA disagrees with the commenter's suggestion to require annualized reporting of CO_2 injected prior to the start of the CO_2-EOR project This data element is not annualized in the CSA/ANSI ISO 27916:19 standard, and it is not the EPA's intent to create additional and retroactive monitoring and reporting requirements beyond those already included in this standard. The EPA's intent is to ensure that we have a complete understanding of CO_2 stored/sequestered in the United States, and a single value for total mass of previously injected CO_2 (if any) within the EOR complex at the beginning of the CO_2-EOR project is sufficient for understanding the quantities of CO_2 previously injected.

26.5 Comments on other proposed reporting and recordkeeping requirements under subpart VV

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 53
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: We recommend that EPA revise the proposed regulatory language to enable operators to better address the focus of the GHG reporting program (atmospheric emissions) and to better align with the reporting requirements of subpart RR. This could be achieved by revising the definition of $M_{\text{loss EOR complex}}$ as "the total annual mass of CO_2 loss from the EOR complex (See Clause 8.4.6) or emitted by surface leakage in the reporting year (40 CFR 98.443(e)), metric tons." This revision and associated supporting changes are reflected below:

"§ 98.486 Data reporting requirements.

In addition to the information required by § 98.3(c), the annual report shall contain the following information, as applicable:

> (f) the total mass of CO_2 emitted by surface leakage or loss from the EOR complex ($M_{\text{loss EOR complex}}$)."

Response: The EPA acknowledges the commenter's suggested edits; however, the EPA is finalizing 40 CFR 98.486(f) as proposed in the 2023 Supplemental Proposal. See the response to comment EPA-HQ-OAR-2019-0424-0223-A1, Excerpt 52.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 54
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: The Industry Trades are concerned that certain reporting requirements under subpart VV may also be required elements under subpart W, and the inclusion of these elements under subpart VV may result in double-counting of emissions from a single facility. The proposed regulatory language requires that a reporter deduct emissions from "operations" from the net total of CO_2 stored, as indicated above in Equation VV–1 by the variable M_{loss} operations. The variable M_{loss} operations is then defined in Equation VV–2 as presented below:

> "M_{loss} operations = /$M_{\text{lossleakagefacilities}}$ + $M_{\text{vent/flare loss}}$ + $M_{\text{entrained loss transfer}}$ (Equation VV–2)
>
> Where: $M_{\text{lossleakagefacilities}}$ = Loss of CO_2 due to leakage from production, handling, and recycling CO,-EOR facilities (infrastructure including wellheads), metric tons.
>
> $M_{\text{loss vent/flare}}$ = Loss of CO_2 from venting/flaring from production operations, metric tons.

$M_{loss\ entrained}$ = Loss Of CO_2 due to entrainment within produced gas/oil/water when this CO_2 is not separated and reinjected, metric tons.

$Ml_{oss\ transfer}$ = Loss of CO_2 due to any transfer of CO_2 outside the CO_2-EOR project, metric tons. You must quantify any CO_2 that is subsequently produced from the EOR complex and transferred offsite."

Emissions of CO_2 from venting and flaring from production operations would be captured under subpart W (§ 98.236), therefore, any emissions reported from venting and flaring as a loss of CO_2 from operations would be double counting emissions from the facility. We recommend removing the $M_{loss\ vent/flare}$ Variable from Equation VV–2 or revising the $M_{loss\ vent/flare}$ Variable from Equation VV–2 to align with the specific requirements under Subpart RR, for emissions vented from surface equipment as represented by the variables CO_{F1} and CO_{2FP} in equations RR–11 and RR–12 under 40 CFR 98.443 (f). Additionally, to avoid potential double-counting, the loss of CO_2 from venting/flaring from production operations ($M_{loss\ vent/flare}$) Should be removed from the data reporting requirements (§ 98.486(e)(2)) in the proposed regulatory language or revised in a manner consistent with Subpart RR.

Response: The EPA acknowledges the commenter's concerns, but the emissions from these sources will not be double counted within the GHGRP. Subpart VV is not a direct emitter subpart. Similar to subpart RR, emissions from equipment leaks and emissions reported under subpart VV are used in equation VV–2 (finalized as equation 2 to § 98.483(d)) determine the mass balance of CO_2 sequestered; they are not added to the facility emissions reported under other subparts including subpart W. Therefore, there is no double-counting for emissions.

26.6 Comments on proposed confidentiality (CBI) or inputs reporting determinations for subpart VV

Commenter Name: William Swetra
Commenter Affiliation: Oxy Low Carbon Ventures (OLCV)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0217-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA's role here is critically important. Final regulations issued on the section 45Q tax credit for qualified carbon oxide sequestration stated that the Treasury Department and the Internal Revenue Service (IRS) did not have the authority to require those using the ISO CO_2-EOR Standard to publicly report the amount of CO_2 geologically stored. While it is not the role of the EPA to remedy the IRS's lack of authority to require reporting, it is the responsibility of the EPA to maintain a complete inventory of GHG emissions and by not requiring the reporting of GHG emissions stored and quantified using the ISO CO_2-EOR Standard, the GHG Emissions and Sinks Inventory is not complete.

OLCV strongly supports the publishing of non-confidential data related to anthropogenic CO_2 volumes permanently stored in CO_2-EOR operations and the associated documentation for reporters choosing the ISO CO_2-EOR Standard on EPA's website because this will result in a more complete and accurate GHG Emissions and Sinks Inventory. This includes publishing the

EOR Operations Management Plans, which would be similar treatment to the Monitoring, Reporting, and Verification plans developed by subpart RR reporters. Additionally, the reporting of negative emissions quantified using the ISO CO_2-EOR Standard are vital to building and retaining public confidence in the permanent geologic storage of anthropogenic CO_2.

Response: The EPA acknowledges the commenter's support of the proposed confidentiality determinations for data submitted to EPA under 40 CFR 98.486 of subpart VV, including the OMP. The EPA is finalizing the categorical confidentiality determinations as proposed. For additional information, see the response to comment EPA-HQ-OAR-2019-0424-0205-A1, Excerpt 8.

Commenter Name: Jessie Stolark
Commenter Affiliation: Carbon Capture Coalition
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0302-A1
Comment Excerpt Number: 2

Comment Excerpt: For purposes of monitoring the safety and long-term security of CO_2 storage, ISO 27916 may be viewed as an equivalent reporting mechanism to the existing EPA Subpart RR rule, except for the transparency and accountability information that EPA makes publicly available from those EOR operators reporting under Subpart RR.

The Coalition supports EPA publishing non-confidential data on the EPA website related to the amounts of securely stored CO_2 and associated documentation for ISO 27916, as this would harmonize the information available to the public about those projects reporting under Subpart RR and ISO 27916. Additionally, EPA publishing this information does not pose any additional burden to project operators, as the information is already reported to IRS via the ISO standard for purposes of electing the 45Q tax credit.

Response: The EPA acknowledges the commenter's support and is finalizing the categorical confidentiality determinations as proposed. For additional information, see the response to comment EPA-HQ-OAR-2019-0424-0217-A1, Excerpt 2.

Commenter Name: Keith Tracy
Commenter Affiliation: Elysian
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0157-A1
Comment Excerpt Number: 6

Comment Excerpt: We believe the EOR Operations Management Plan (OMP) referenced in § 98.488 should be made a public document, similar in respects to the public nature of a final

Monitoring, Reporting and Verification (MRV) plan issued or approved by the EPA under § 98.448(c). While we understand the OMP under § 98.488 is not approved or issued by the EPA, such a plan serves very similar purposes in comparison to the § 98.448 MRV plan. At a minimum, the plans both include a geologic characterization of the storage location, information about wells within the storage site area, operations history, monitoring program, and calculation and quantification methods used to determine the total amount of CO_2 stored in the storage site. Other similarities between the two plans are described in the preamble at 87 Fed Reg 37,015 2nd column. Because the two respective plans serve similar purposes, we believe the two plans should similarly be public documents. Even though the proposed rules explain that EPA is not proposing to approve or issue the OMP (87 Fed Reg 37,016 2nd column), the proposed rules are not clear regarding whether the OMP will be released to the public. There is nothing in the proposed rules that says the agency must release or otherwise make public the OMP. We believe § 98.488 could be amended to add the following subsection:

> (e) The Administrator shall release to the public the EOR operations[1] management plan and any update there to, as well as each certification by the qualified independent engineer or geologist.

Footnotes

[1] We note that § 98.488 denotes the EOR Operations Management Plan as a plural of "operations." The phrase EOR "operation" management plan is used in the singular in § 98.488(c) and, to be consistent, the EPA should consider revising that singular use in favor of the plural.

Response: The EPA acknowledges the commenter's support; however, we disagree with the commenter's suggestion that regulatory text be added to 98.488 to specify that the Administrator will release the OMP. Such a regulatory requirement would be inconsistent with GHGRP's approach to confidentiality determinations and data publishing. In proposing and finalizing rules, the EPA makes categorical determinations on confidential business information (CBI) for each data element rather than specifying in the regulatory text whether data are public or confidential. For the proposed rule (June 2022) and the supplemental proposed rule (May 2023), the EPA proposed a categorical determination of "Not CBI" for the OMP and is finalizing the rule today with the OMP as not eligible for confidential treatment in the memorandum entitled "Confidentiality Determinations and Emission Data Designations for Data Elements in the 2024 Final Revisions to the Greenhouse Gas Reporting Rule," available in the docket to this rulemaking, EPA-HQ-OAR-2019-0424.

Commenter Name: George D. Baker
Commenter Affiliation: Energy Advance Center (EAC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0205-A1
Comment Excerpt Number: 8

Comment Excerpt: EPA has not proposed mandating public disclosure of Operations Management Plans prepared for EOR projects for which reports are filed under Subpart VV and it should not do so. Disclosure of the Management, Reporting and Verification Plan (MRV) under Subpart RR is not a compelling reason for mandating disclosure of an OMP reported under Subpart VV. Unlike an MRV which must receive approval by EPA under Subpart RR reporting, there is no such approval required for an OMP under Subpart VV. That different treatment is appropriate given the differences in the subparts. In urging EPA not to mandate disclosure of an OMP under Subpart VV, we observe that reporting entities are free to exercise their discretion to publicly disclose their OMPs.

Response: See section VI.B.2 of the preamble to the final rule for the EPA's response to this comment.

27.0 Responses to the request for comments on Inclusion of CO_2 Utilization in Part 98

27.1 Comments that support or oppose the inclusion of CO_2 Utilization in Part 98

Commenter Name: Jessie Stolark
Commenter Affiliation: Carbon Capture Coalition (the Coalition)
Commenter Type: Other
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0206-A1
Comment Excerpt Number: 4

Comment Excerpt: The proposed regulations also ask the question whether EPA should add CO_2 utilization (beyond the purposes for use in EOR operations) as a source category in part 98 of GHGRP, as currently, there is not a source category strictly related to CO_2 utilization. The Coalition appreciates EPA considering this question and agrees that better understanding of sources and sinks of CO_2 will better inform efforts to reduce CO_2 emissions and programs under the Clean Air Act. The Coalition urges EPA take its time and give due consideration to the creation of any reporting program for the nascent CO_2 utilization industry to avoid inadvertently create further barriers to the deployment of these climate essential technologies.

First, the volume of CO_2 utilized is already reported by emitting facilities under the current reporting structure of the GHGRP. Unlike geologic storage, processes that utilize carbon oxides can be either a source of greenhouse gas emissions or a sink, creating increased complexity in designing reporting standards. Requiring full lifecycle assessment of products sourced from CO_2 utilization also sets a unique and significantly higher reporting standard than for other source categories in the GHGRP. Therefore, the benefit of additional reporting requirements for one industry under the GHGRP should be weighed against the additional burden it places on project developers. EPA should not take any steps that would serve to add additional and unique reporting requirements to the still nascent carbon utilization sector.

The current information contained within the draft regulations is insufficient to draw conclusions as to the purpose and benefit of adding utilization to the GHGRP. Therefore, the Coalition recommends that to properly consider whether CO_2 utilization should be added to the GHGRP,

EPA should conduct a public engagement process, whether through a formal Request for Information, or by other means, to gain a better understanding of the very complex considerations of greenhouse gas emissions and sinks related to CO_2 utilization. The Coalition and its members stand ready to assist EPA in any such public processes.

Response: Upon consideration of comments received on the June, 22, 2022 proposed rule, the EPA has not subsequently proposed, and is not taking final action on, any additional requirements for a source category that is solely related to CO_2 utilization in the final rule.

While EPA is not collecting new data on CO_2 utilization in this rule, we understand that acquiring such data may be important in the future. Therefore, we are continuing to undertake research on and exploring options for possible future data collection on CO_2 utilization, and the uses of such data. The EPA may consider these changes in future rulemakings. In the event that a future rulemaking is pursued, the EPA may consider the issues raised by commenters, including the most effective source for this data; how to define the source category; reliability of monitoring, reporting, and verification plans; and requirements for GHG lifecycle assessments.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 27

Comment Excerpt: We recommend that EPA undertake further research and development on utilization and the ability to demonstrate long-term secure sequestration utilizing reliable, repeatable, and verifiable MRV plans. Without that information, it would be difficult to develop a new subpart. EDF recognizes EPA's intent and challenge in considering when and how to incorporate the potentially growing field of CO_2 utilization in the GHGRP. However, because science, data, and other basic information on the utilization industry broadly is limited at this time — including potentially substantive gaps in monitoring, reporting, and verification plans and capabilities for these projects — it is not clear to us that the time is right to establish a new source category.

Response: See response to comment EPA-HQ-OAR-2019-0424-0206-A1, Excerpt 4.

27.2 Comments on the definition of the source category

Commenter Name: Keith Tracy
Commenter Affiliation: Elysian
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0157-A1
Comment Excerpt Number: 7

Comment Excerpt: We note the EPA's request for comment regarding whether to add a source category related to CO_2 utilization. We understand the carbon capture industry, and the IRS Section 45Q regulations, includes within the category of "CO_2 utilization" the anthropogenic CO_2 captured from industrial emissions that "displaces" other CO_2 such as geologically sourced CO_2. As a result, any "CO_2 utilization" source category would therefore necessarily include some of the CO_2 that is currently reported under Subpart PP, such as food or beverage grade CO_2 (which, by the way, is typically measured in terms of short tons instead of metric tons). We would encourage EPA to ensure that any new source category be defined in such a manner so as to not require reporting of the same CO_2 volumes/amounts under more than one source category. We also note that the EPA seeks input on whether a GHG LCA should be required for CO_2 Utilization. See 87 Fed Reg 37,022 3rd column. For Section 45Q purposes, we believe that any DOE-approved LCA should be made public. Assuming the IRS will not make such LCA public, and the DOE fails to release such LCA to the public, then we would encourage EPA to consider requiring the LCA to be made public.

Response: See response to comment EPA-HQ-OAR-2019-0424-0206-A1, Excerpt 4 in section 27.1 of this document.

28.0 Comments on Subpart WW of Part 98

28.1 Comments that support or oppose the inclusion of a separate coke calciner source category in Part 98

Commenter Name: Curt Wells
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0218-A1
Comment Excerpt Number: 2

Comment Excerpt: One of the Association member companies operates a petroleum coke calcining facility. The calcined petroleum coke that is manufactured at this facility is sold for offsite use in the production of carbon anodes for use in the primary aluminum production industry. This coke calcining facility is stand-alone, meaning it is not co-located at a petroleum refinery, nor is it co-located at a primary aluminum production facility. The facility reports greenhouse gas emissions pursuant to the requirements of 40 CFR Part 98. All greenhouse gas emissions resulting from the combustion of petroleum coke in the calcination kiln are reported pursuant to the requirements for reporting combustion of solid fuels in Part 98, Subpart C. The Association believes greenhouse gas emissions from coke calciners are adequately addressed by Subpart Y for calciners co-located at petroleum refineries and Subpart C for stand-alone coke calciners. Therefore, a separate subpart is not necessary given the adequacy of the existing subparts.

A portion of the green petroleum coke that is received at this facility is imported into the United States and pursuant to the requirements of 40 CFR Part 98, Subpart MM, the facility also reports greenhouse gas emissions associated with the potential future combustion of this imported coke. Per 40 CFR § 98.390, the Subpart MM, "Suppliers of Petroleum Products," source category:

"consists of petroleum refineries and importers and exporters of petroleum products and natural gas liquids as listed in Table MM–1 of this subpart." Petroleum coke is included in Table MM–1 within Subpart MM, indicating that it is a petroleum product that is subject to Subpart MM reporting.

However, the calcined petroleum coke that is produced at the referenced coke calcining facility will not be used as a fuel, but instead will be used as a component of the anodes used in the primary aluminum industry. The greenhouse gas emissions associated with the consumption of this coke in the primary aluminum industry are subject to separate reporting under Subpart F, or, to the extent that the calcined petroleum coke is exported, to similar reporting requirements in the country of subsequent import. As such, from a global greenhouse gas inventory perspective, the prospective greenhouse gas emissions associated with petroleum coke that is imported to this stand-alone coke calcining facility which will be calcined to produce calcined petroleum coke for the primary aluminum industry are being double-reported under Subpart MM and Subpart F-type requirements. Double counting of these emissions results in an inaccurate picture of global greenhouse gas emissions.

As EPA considers potential updates to Part 98 reporting, the Association requests that EPA modify the Subpart MM requirements to exclude imports of petroleum coke that is not intended for use as a fuel from the requirements of Subpart MM reporting. For example, in Table MM–1, the below footnote for petroleum coke is recommended: "1 Petroleum coke that is not used for fuel purposes is excluded."

[See DCN EPA-HQ-OAR-2019-0414-0219-A1 for recommended revised Table MM–1]

Response: We disagree with the commenter that the current rule requirements are sufficient for stand-alone coke calcining facilities. As discussed in the preamble to the 2023 Supplemental Proposal, the subpart C methodology assumes the coke is fully combusted, whereas the coke calciner is designed to drive off and combust only the volatile fraction of the green coke. As such, the subpart C method is inconsistent with and less accurate than the coke calciner methods proposed and being finalized. It is also possible that operators of coke calciners that do not use the heat generated from the process to produce steam or other useful heat or energy to consider that the process does not meet the definition of a stationary combustion source, such that some coke calcining emissions may not be reported under subpart C. For these reasons, we are finalizing the subpart WW requirements to apply to all coke calcining facilities, as proposed. Regarding the commenter's concerns about double-reporting and double counting emissions, and the commenter's request to modify subpart MM of part 98, see response to comment EPA-HQ-OAR-2019-0424-0301-A1, Excerpt 8.

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 8

Comment Excerpt: The Association would also like to bring attention to its comments submitted for the June 2022 proposed rule that recommends the EPA remove imported petroleum coke reporting requirements from Subpart MM "Suppliers of Petroleum Products" to avoid double counting emissions from similar data requirements in Subpart F "Aluminum Production."

Response: We did not propose or request comment on revisions to subpart MM; these comments are out of scope of this rule. We disagree that suppliers of petroleum products should have to be able to know or divine the end-use of the products that they produce, import, or export and use different calculation methods based on that end-use. Even if end-use of subpart MM products was known, we disagree that reporting under subpart MM and subpart F-type requirements results in double counting of emissions. In response to comments on the 2009 Proposed Rule regarding the potential double counting of emissions reported by power plants and electricity purchased downstream from those power plants, the EPA noted that there is inherent and intentional double reporting of emissions in a program that includes both energy suppliers and energy users (*i.e.*, suppliers and direct emitters, 74 FR 16479, April 10, 2009), and that both supply- and demand-side data are necessary to evaluate and identify the best policy options. However, double reporting is not inherently the same as double counting. Subparts C (General Stationary Fuel Combustion Sources) and NN (Suppliers of Natural Gas and Natural Gas Liquids) are an example in the existing GHGRP requirements of double reporting. Double counting is likely best characterized as a form of misuse or misunderstanding of two reported values, where an analyst could potentially improperly add potential emissions (calculated from the subpart NN supplier's data) to actual emissions (from the subpart C user's data) and erroneously represent the sum of these two values as the total emissions from the energy transaction. To mitigate the potential for any such double counting by users of part 98 data, the EPA designates subparts as either "direct emitter" or "supplier" subparts.

28.2 Comments on the definition of the source category

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 46
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: While EPA is considering the development of a new source category for dedicated coke calcining facilities (87 FR 37016), EPA should not move reporting of emissions from coke calcining units at refineries from subpart Y to any new category that may be created. Such a change may create an unnecessary and unjustified burden for reporters already including this data as required under subpart Y.

Response: See response to comment EPA-HQ-OAR-2019-0424-0223-A1, Excerpt 56.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 56
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: The Industry Trades support efforts by EPA to ensure that all major sources of GHG emissions are captured in the reporting program. As noted in the technical supporting document provided to the docket by EPA, most of the known coke calcining process units are located at or near petroleum refineries.[8] As such, GHG emissions from coke calcining process units are typically reported using methodologies required under subpart Y. EPA has suggested that coke calcining process units that are unrelated to petroleum refineries would be reporting under subpart C given current requirements, if they report at all.

If EPA intends to create a new source category for dedicated coke calcining facilities, EPA should apply the same methodologies and reporting requirements as currently existing for coke calcining units under subpart Y. This is the only approach that would ensure comparability across the two populations of coke calcining units. EPA should not require dedicated coke calcining facilities to report under subpart Y, however, as this could confuse users of the EPA data regarding the emission profile of the domestic refining industry. Further, the reporting of emissions from coke calcining units within refineries should remain within subpart Y, and not be moved to any newly created source category for dedicated coke calcining facilities.

Footnotes

[8] EPA, Technical Support Document for Coke Calcining: Proposed Rule for the Greenhouse Gas Reporting Program. January 2022.

Response: We agree with the commenter regarding using a unified reporting methodology for all coke calciners and are finalizing the calculation methodologies as proposed. However, we disagree with the commenter that moving the reporting requirement for coke calciners co-located at petroleum refineries is unnecessary or that it will create unjustified burden for reporters. We find that it will be much easier for the EPA and other end-users of the reported data to be able to download files from a single unified subpart to access emissions from coke calciners rather than having to download multiple files from multiple different subparts to access and evaluate the data. This will ensure that any policy analysis conducted for coke calciners is consistent and complete. We maintain that the improvements in the accessibility and usability of the data justify unified reporting under the new subpart WW and are finalizing this requirement as proposed.

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 6

Comment Excerpt: In reviewing the preamble discussing the proposed new Subpart WW, the Association noted that the description of coke calciners may be overly narrow. It reads: "Coke calcining is a process in which "green" petroleum coke with low metals content (commonly called "anode grade petroleum coke") is heated to high temperatures in the absence of air or oxygen for the purpose of removing impurities or volatile substances in the green coke." The "in the absence of air or oxygen" language is not necessarily accurate. Air/oxygen is necessary for combustion to occur. The high temperatures required for proper calcination are primarily derived from the combustion of the volatiles and carbon in the green coke.

Response: See section III.BB.2 of the preamble to the final rule for the EPA's response to this comment.

28.3 Comments on calculation methodologies

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 47
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: We encourage EPA to consider the use of stack testing or performance testing data as a substitute for CEMS. EPA already allows for the use of substitute data when CEMS is not available under Method 1. EPA should allow for increased usage of test data as a proactive measure given challenges to CEMS. Further, determination of stack flow from a coke calciner could be either from direct measurement using a flowmeter on the stack or a correlation that is developed during a performance test that measures the stack flow based on either green coke input or calcined coke output. The correlation would be based on a performance test for each coke calciner that could be conducted periodically and the factor from the last test used until the next test performed, rather than an industry average. If more than one performance test is conducted per year, then the stack flow factor could be the average of tests conducted in that year. Allowance of this alternate approach is necessary because stack flowmeters can be unreliable, and use of a stack flow correlation prevents potential large periods of data substitution which may not be as accurate as a correlation based on actual operating data.

Response: See response to comment EPA-HQ-OAR-2019-0424-0314-A1, Excerpt 30.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association

Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 48
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: Coke calciners can use refinery fuel gas or natural gas during startup or during hot standby, and the emissions from these fuel gases should be allowed to be reported using a methodology from 40 CFR 98 subpart C, and these emissions reported under subpart C, separately from the coke calciner emissions. If coke calcining and fuel gas combustion are occurring simultaneously then the fuel gas emissions should be subtracted from the emissions that are calculated using the CEMS and proposed stack flow methodology to avoid possible double counting. The requirements for fuel gas or natural gas composition and heat content use in coke calciners should be the same as required in subpart C.

Response: See section III.BB.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Not provided
Commenter Affiliation: American Petroleum Institute (API) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0314-A1
Comment Excerpt Number: 30

Comment Excerpt: The proposed Subpart WW includes two proposed calculation methods to determine the CO_2 emissions from coke calciners in section 40 CFR § 98.493(a). The first method uses the Tier 4 method that requires Continuous Emissions Monitoring Systems (CEMS) and requires a stack flowmeter. Stack flowmeters on coke calciners can be unreliable and can be difficult to maintain while the unit is operating. Coke calcining units that do not currently have a stack flowmeter would need to purchase, install, maintain and calibrate them, which could be a cost in excess of the Capital and O&M costs given in Table 10 for an incremental burden.

The second method is a carbon balance based on the mass and composition of the green carbon feed, petroleum coke dust and marketable coke produced. Coke calcining units that do not currently weigh all of these streams or conduct regular sampling could be required to install new scales and collect and analyze samples which may again require expenditures in excess of the incremental burden costs estimated in Table 10. There may be issues getting the carbon mass to balance, as uncertainties in weights and coke composition could lead to under or overestimation of CO_2 emissions.

There is a third method, currently used at a coke calcining unit and currently used to comply with a Washington State GHG Reporting program, that should be included as an approved method in Subpart WW section § 98.493(a). In this method a performance test is conducted to measure the stack flow while the CO_2 and O_2 concentrations are measured using a CEMs system, and either

the green coke input or calcined coke output is weighed. The result of the performance test is to determine the coke calciner stack flow based on either green carbon input or marketable coke output. This allows the CO_2 emissions for each hour of the year to be calculated using the weighed coke input or output, the CEMs CO_2 and O_2 concentrations and the stack flow factor from the performance test. The performance test is conducted periodically and the factor from the last test is used until the next stack test is performed. The stack flow factor is corrected to a set excess oxygen concentration, and the CEMs data measured throughout the year to allow the measured CO_2 concentration to be corrected to the same excess oxygen concentration.

This third method combines elements from both of the methods currently included in the proposed Subpart WW. It has an advantage that use of a stack flow factor prevents potential large periods of data substitution when the stack flowmeter is not operating. The Industry Trades request that EPA add this third method to the proposed Subpart WW. The addition of an alternate State approved method is consistent with provisions that the EPA has previously made in the Tier 4 methodology in 40 CFR 98.34(c)(1)(iii) and 40 CFR 98.36(e)(2)(vii)(A) that allow a State approved monitoring program.

Response: The method described by the commenter is similar to the method provided in Equation Y–7a subpart Y where CO, CO_2, and O_2 measurements are used with air feed rates to estimate the exhaust flow rate from the catalytic cracking unit regenerator. Because the method described by the commenter does not directly determine the flow rate, it is not provided for under CEMS methodology. Furthermore, we find, consistent with the proposed requirement, that if a CEMS is installed (meaning both a continuous CO_2 concentration monitor and a continuous flow monitor) that the CEMS must be used for the CO_2 emission calculation because direct measurement of the flow rate combined with the CO_2 concentration at that time is expected to provide the most accurate estimate of annual CO_2 emissions. Additionally, we are not aware that direct exhaust gas flow meters experience significant downtime nor did the commenter provide such evidence. Moreover, the commenter did not provide information on the frequency of the periodic test used to establish the relationship between the weighed coke input or output, the CEMs CO_2 and O_2 concentrations and the stack flow factor from the performance test. However, we are inclined to agree that the approach described by the commenter may be as accurate as the mass balance method if the weighted coke input or output, CO_2, and O_2 are accurately monitored and the algorithms provided adequately address times when auxiliary fuel is used. We intend to continue to evaluate this additional calculation method and may include it in a future rulemaking proposal, if appropriate, to allow sufficient time for public comment.

28.4 Comments on monitoring methodologies and quality assurance requirements

Commenter Name: Andrew Smith
Commenter Affiliation: The Aluminum Association
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0301-A1
Comment Excerpt Number: 7

Comment Excerpt: In the proposal, EPA outlines prescriptive requirements for measuring the quantity of green coke, calcined coke and coke dust for the purposes of supporting mass balance

calculations. The Association requests the Agency allow for further flexibility in measuring these data elements, in alignment with other Clean Air Act programs already in place. Coke calciners may use various methods to estimate calcined coke production quantities or dust losses, which may not be suitable for calibration, as outlined in the proposal. Furthermore, coke dust losses may not be limited to coke collected in dust collectors. Methods for determining coke losses can include an assumed percent loss, and production quantities may be determined by silo measurements or marine draft surveys. EPA should allow for these values to be estimated in accordance with acceptable accounting methods and/or as is done for purposes of reporting throughput quantities under the facility's Clean Air Act permit.

If EPA declines to adopt these accepted alternative measurement methods, the Association is concerned that bringing existing facilities up to the new standards would result in excessive burdens and costs for operations. For an existing facility, the cost to add new measurement devices could be very substantial, significantly more than the $19,649 value listed on page 32911 of the proposed rule.

Response: This final rule requires that facilities determine, on a monthly basis, the mass of green coke, calcined coke and coke dust using equipment meeting the requirements for commercial weighing as described in Specifications, Tolerances, and Other Technical Requirements For Weighing and Measuring Devices, NIST Handbook 44-2023 (November 2022). NIST Handbook 44-2023 is not limited to a single approach for measuring these parameters; the handbook includes a wide variety of measurement systems (*e.g.*, scales, belt-conveyer scale systems, automatic bulk weighing systems, weights, automatic weighing systems, etc.). We expect that most existing facilities will be able to meet these measurement requirements, as they likely already use one of these measurement systems for monitoring key parameters to optimize production and track feedstock and product quantities. We disagree that the methods recommended by the commenter, including "an assumed percent loss" or marine draft surveys, or other volume measurements are as accurate as direct mass measurements. The mass balance method requires significant accuracy in the mass measurements because only a small fraction, typically less than 10 percent, of the coke fed to the unit is lost or combusted through the process We maintain that accurate measurements of the mass of coke calcined is essential for the mass balance method.

The commenter did not provide any supporting information or documentation regarding their comment that the cost to add new measurement devices could be "significantly more" than EPA's cost estimates provided for complying with the rule. Therefore, we do not have information to adjust the estimated cost to an individual facility to comply with the rule.

28.5 Comments on reporting requirements

Commenter Name: Leslie Bellas
Commenter Affiliation: American Fuels and Petrochemical Manufacturers (AFPM)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0323-A1
Comment Excerpt Number: 7

Comment Excerpt: While AFPM does not take issue with EPA's proposal to revise subpart Y (Petroleum Refineries) to remove and separate reporting requirements for coke calciners under a new source category (subpart WW) and the proposal to require reporting for non-merchant hydrogen, the proposal to report certain operational data of these sources is not necessary to calculate GHG emissions and violates the PRA's requirement that collected information have practical utility. Moreover, these aspects of the Proposal raise significant confidentiality concerns.

The PRA requires agencies to ensure the "practical utility" of collected information. "Practical utility" is defined as:

[T]he actual, not merely the theoretical or potential, usefulness of information to or for an agency, taking into account its accuracy, validity, adequacy, and reliability, and the agency's ability to process the information it collects (or a person's ability to receive and process that which is disclosed, in the case of a third-party or public disclosure) in a useful and timely fashion…[20]

AFPM does not object to EPA's proposal to create a new source category for coke calciners and the proposed definition of the source category, the reporting threshold, GHGs to report, method of calculating GHG emissions, monitoring emissions, and procedures for estimating missing data (see proposed §§ 98.490-495). But we are concerned with requirements to submit, rather than only retain records of:

- Annual mass of green coke fed to the coke calcining unit from facility records (metric tons/year).
- Annual mass of marketable petroleum coke produced by the coke calcining unit from facility records (metric tons/year).
- Annual mass of petroleum coke dust removed from the process through the dust collection system of the coke calcining unit from facility records (metric tons/year).
- Annual average mass fraction carbon content of green coke fed into the calcining unit from facility measurement data (metric tons C per metric ton petroleum coke).
- Annual average mass fraction carbon content of marketable petroleum coke produced by the coke calcining unit from facility measurement data (metric tons C per metric ton
- petroleum coke).[21]

AFPM agrees with current regulations requiring facilities to retain this information so the Agency can verify reported GHG emissions and proposed 40 CFR §§ 98.497(b), which requires facilities to retain verification software records, especially when continuous emissions monitors (CEMs) are used to calculate emissions.[22] Reporting this information under all circumstances is unduly burdensome, has no practical utility as required by the PRA, and undermines business interests.[23] Requiring retention of this information, rather than data submission, is consistent with other subparts.[24] Should EPA move forward with its requirement to submit verification data for coke calciner units, it would be arbitrary and capricious to apply one set of requirements to one

source category, but abandon that requirement for others, particularly without any supporting rationale for disparate treatment.

Footnotes

[20] 5 CFR Part 1320.3(l).

[21] 88 Fed. Reg. at 32,940 (Proposed 40 CFR §§ 98/496(e)-(i)).

[22] See 40 CFR §§ 98.256(f)(6) and 257(b)(28)-(b)(31).

[23] See Paperwork Reduction Act, 44 U.S.C. § 3504(c)(4) (data submissions should "maximize the practical utility of and public benefit from information collected by or for the Federal Government") (1995); see also id. § 3501(2).

[24] See 40 CFR §§ 98.76-77, §§ 98.86-87, §§ 98.196-197, and §§ 98.256(f)(6) and 257(b)(28)-(b)(31).

Response: We disagree that the proposed reporting elements are of no practical utility. There are many instances in the GHGRP where there are calculation and recordkeeping requirements provided at one time scale, such as weekly flare flow and carbon content [Equation Y–1a at 40 CFR 98.253(b)(1)(ii)(A)], with reporting of annual flow volumes and average carbon content [40 CFR 98.256(e)(6)]. We have found that the additional reporting elements are very useful in reviewing and verifying annual GHG reports. In the example noted, the annual flare volumes and annual average carbon content provides a means by which we can independently estimate CO_2 emissions and verify the reported data. Without these reporting elements, we would have no way to verify the reported CO_2 emissions. We agree that there have been sources when only recordkeeping requirements apply, but we have found that we could not verify the reported emissions in these cases. We have been working to add reporting elements that can be used to help verify reported emissions [*e.g.*, 40 CFR 98.166 and 40 CFR 98.256(j)(2) and (k)(6)] and our proposed revisions with the reporting elements for coke calciners is consistent with this effort. We maintain that the direct data inputs to the Equation WW–1 (finalized as equation 1 to § 98.493(b)(2)) are recordkeeping requirements retained via the verification software records [40 CFR 98.497(b)], but that the annual average values for the mass of green coke processed, calcined coke produced, and carbon content of these streams should be directly reported to assist in the verification of the data. We proposed and are finalizing our determination that these data elements are eligible for confidential treatment. We find that the proposed reporting elements are essential for verification of the reported GHG emissions and we are finalizing the reporting requirements as proposed.

29.0 Comments on Subpart XX of Part 98

29.1 Comments that support or oppose the inclusion of calcium carbide production in Part 98

Commenter Name: Hannah Gotsch
Commenter Affiliation: Carbide Industries LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0172-A1
Comment Excerpt Number: 1

Comment Excerpt: Carbide Industries is the only commercial producer of calcium carbide in the United States. Carbide Industries has been and intends to continue to voluntarily report its greenhouse gas emissions (GHGs) under subpart K {Ferroalloy Production) of Part 98. (See 87 Fed. Reg. 37019.) Carbide Industries does not believe that U.S. EPA should require calcium carbide production facilities to report GHG emissions under the GHGRP.

Response: We disagree that a new source category is unnecessary, as it would provide accurate applicability requirements and require data specific to the calcium carbide industry. The subpart K calculation methodology is not intended for calcium carbide production processes, and the existence of a calcium carbide facility reporting under subpart K presents data quality issues for EPA analyses of ferroalloy production, such as those for the GHG Inventory. Additionally, a separate subpart will better align with international emissions evaluations by separating calcium carbide production emissions from ferroalloy production. While we recognize that the commenter's facility currently reports voluntarily to the GHGRP, there is no guarantee that the EPA will continue to receive this information. Accurate and consistent reporting of emissions and activity data will help us to better understand the calcium carbide industry's overall contributions to GHG emissions in the U.S.

Commenter Name: Hannah Gotsch
Commenter Affiliation: Carbide Industries LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0172-A1
Comment Excerpt Number: 3

Comment Excerpt: CaC2 production should not be regulated by Subpart BB. Carbide has evaluated that commercial calcium carbide does not fall under similar production methods as silicon carbide production under Subpart BB. Subpart BB (Silicon Carbide Production) requires determination of carbon content of the petroleum coke. However, commercial calcium carbide in North America is produced with its carbon-containing raw materials predominately being sourced from metallurgic-based coke.

Response: The EPA acknowledges the commenter's support that calcium carbide sources should not be covered under subpart BB (Silicon Carbide Production) as questioned in the NPRM.

29.2 Comments on the definition of the source category

Commenter Name: Hannah Gotsch
Commenter Affiliation: Carbide Industries LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0172-A1
Comment Excerpt Number: 2

Comment Excerpt: Carbide Industries is the only commercial producer of calcium carbide in the United States. Should EPA determine that commercial producers of calcium carbide be required to report GHG emissions under the GHGRP, Carbide Industries does not believe a separate CaC2 source category to the GHGRP is necessary. Instead, Carbide Industries recommends that coverage under Subpart K (Ferroalloy Production) of Part 98 be expanded to include commercial calcium carbide production facilities.

Response: See response to comment EPA-HQ-OAR-2019-0424-0172-A1, Excerpt 1 in section 29.1 of this document.

Commenter Name: Hannah Gotsch
Commenter Affiliation: Carbide Industries LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0172-A1
Comment Excerpt Number: 6

Comment Excerpt: Carbide Industries does not produce acetylene gas at its Louisville Calcium Carbide plant. Moreover, the production of acetylene gas from calcium carbide results in de minimis emissions of CO_2. Carbide Industries does not believe that emissions associated with acetylene gas production should be included with the GHGs reported under the GHGRP.

Response: The EPA recognizes that the commenter does not produce acetylene gas from calcium carbide production and is currently the only calcium carbide reporter to GHGRP. However, this facility or others may produce it in the future. We are not requiring at this time that GHG emissions from the production of acetylene be reported. Instead, we are requiring reporting of calcium carbide production (and production capacity) data, the number of calcium carbide process units, and annual facility consumption of petroleum coke, the end use of calcium carbide sent off site, and (if applicable) the annual production of acetylene, the annual quantity of calcium carbide used for the production of acetylene, and the end use of the produced acetylene. The acetylene production data would improve verification and data quality of reported emissions and provide a more accurate national-level emissions profile for the calcium carbide industry and the U.S. GHG Inventory. Acetylene production data would also be important for determining if acetylene production emissions data should be collected in the future.

29.3 Comments on calculation methodologies

Commenter Name: Hannah Gotsch
Commenter Affiliation: Carbide Industries LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0172-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA has proposed three GHG calculation methodologies for calcium carbide production facilities based on the 2006 IPCC Guidelines (87 Fed. Reg. 37019). Carbide Industries LLC prefers the carbon consumption methodology that assumes a stoichiometric conversion. This methodology is preferred primarily because Carbide Industries has the necessary information most readily available.

Response: The EPA acknowledges the commenter's support for the carbon consumption calculation methodology. For facilities that do not have CEMS that meet the requirements of 40 CFR part 98 subpart C, we are finalizing the carbon balance methodology. Use of facility specific information is consistent with IPCC Tier 3 methods and is the preferred method for estimating emissions for other GHGRP sectors. For any stationary combustion units included at the facility, facilities will be required to follow the existing requirements at 40 CFR part 98, subpart C to estimate emissions of CO_2, CH_4, and N_2O from stationary combustion.

Commenter Name: Hannah Gotsch
Commenter Affiliation: Carbide Industries LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0172-A1
Comment Excerpt Number: 5

Comment Excerpt: Carbide Industries believes the proposed stoichiometric conversion is incorrect for commercial calcium carbide production. The Technical Support Document for Calcium Carbide: Proposed Rule for the Greenhouse Gases Reporting Program (ID# EPA-HQ-OAR-2019-0424-0107) Equation 2 which uses a stoichiometric conversion uses an adjustment factor of 0.33 for the amount of carbon in calcium carbide product (assuming 67% of carbon input is in the carbide product). This adjustment factor is better reflected as 0.28. Commercial calcium carbide is not a pure product and the reaction stoichiometry cited is for 100% pure calcium carbide. To account for the purity level of commercial calcium carbide product, it is necessary to use a carbon conversion factor that converts a little over one quarter of the raw material carbon input as CO_2.

Response: The EPA did not propose this calculation method in the 2023 Supplemental Proposal, so this comment does not affect the calculation methodology in the final proposal.

30.0 Comments on Subpart ZZ of Part 98

30.1 Comments that support or oppose the inclusion of ceramics production in Part 98

Commenter Name: Joseph Kasper
Commenter Affiliation: The Brick Industry Association (BIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0180-A1
Comment Excerpt Number: 1

Comment Excerpt: BIA urges EPA not to require industry-specific reporting for brick manufacturing plants under the Greenhouse Gas Reporting Program. Based on BIA's best industry wide GHG emissions estimates, GHG emissions from the brick industry represent only about 0.027 percent of the Nation's anthropogenic GHG emissions inventory. So any relative improvement in the accuracy of this estimate that might be gained by requiring industry-specific annual reporting would not change the fact that GHG emissions from this industry are a very small fraction of the national total.

Response: See section III.EE.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Joseph Kasper
Commenter Affiliation: The Brick Industry Association (BIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0180-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA's existing methods for estimating greenhouse gas ("GHG") emissions from the brick manufacturing industry are easily good enough to adequately inform the Agency's policy/regulatory decision making and to satisfy EPA's desire and obligation to maintain an accurate national GHG emissions inventory. To the degree that EPA has concerns with the accuracy of its current estimates for the brick industry, BIA stands ready to work with the Agency to provide data and information to either ratify the validity of the Agency's current methods for estimating emissions or, as necessary, to develop improved methods. Alternatively, EPA could issue a one-time information collection request that is targeted to the Agency's particular information needs. Either way, the result makes far more sense than creating a new and ongoing requirement to report industry-specific GHG emissions.

Response: See section III.EE.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Joseph Casper
Commenter Affiliation: Brick Industry Association (BIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0287-A1
Comment Excerpt Number: 1
Supportive Commenters: BIA

Comment Excerpt: As proposed, ceramics production would include brick manufacturing. BIA previously submitted comments to EPA arguing that annual reporting would be unduly burdensome for our industry and is not needed, given that EPA can easily obtain needed

information on GHG emissions from the brick manufacturing industry through other more efficient methods (*e.g.*, a one-time information request rather than an ongoing annual reporting rule).

Response: See section III.EE.2 of the preamble to the final rule for the EPA's response to this comment.

30.2 Comments on the definition of the source category

Commenter Name: Joseph Casper
Commenter Affiliation: Brick Industry Association (BIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0332-A1
Comment Excerpt Number: 1

Comment Excerpt: As stated in comments submitted on September 25, 2022, BIA believes that EPA already has adequate information on greenhouse gas ("GHG") emissions from the brick industry. Therefore, BIA urges EPA not to create a new annual reporting obligation for brick producers under the GHGRP. Based on BIA's best industry-wide GHG emissions estimates, GHG emissions from the brick industry represent only about 0.027 percent of the Nation's anthropogenic GHG emissions inventory. Any relative improvement in the accuracy of this estimate that might be gained by requiring facility-specific annual reporting under the proposed Subpart ZZ would not change the fact that GHG emissions from this industry are a very small fraction of the national total. EPA's existing methods for estimating greenhouse gas ("GHG") emissions from the brick manufacturing industry are easily good enough to adequately inform the Agency's policy/regulatory decision making and to satisfy EPA's desire and obligation to maintain an accurate national GHG emissions inventory.

To the degree that EPA has concerns with the accuracy of its current estimates for the brick industry, BIA stands ready to work with the Agency to provide data and information to either ratify the validity of the Agency's current methods for estimating emissions or, as necessary, to develop improved methods.

EPA could issue a one-time information collection request that is targeted to the Agency's particular information needs. Either way, the result makes far more sense than creating a new and ongoing requirement to report facility-specific GHG emissions.

Response: See section III.EE.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Joseph Casper
Commenter Affiliation: Brick Industry Association (BIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental

Document Control Number: EPA-HQ-OAR-2019-0424-0332-A1
Comment Excerpt Number: 4

Comment Excerpt: Reasons to exclude brickmakers from Subpart ZZ.

Historically brickmakers in the USA have had low carbonate clay and shale materials available for the production of brick. As a result, the various processes used to prepare raw materials and to form and fire brick have evolved in such a way that higher carbonate materials cannot be used. These processes include but are not limited to coarse vs. fine grinding of materials, stiff extruded direct set scenarios, "fast" firing cycles and a need to achieve near 100% recovery dictated by various robotic and automated processing.

High carbonate materials, if not sized much smaller than is practiced in the US, can result in durability problems of the brick. These defects can range from cosmetic "lime pops" to scenarios where the brick can actually fail in service. The failure mechanism is a result of the calcining of carbonates, shrinkage and glass formation in the firing process, followed by rehydration of the calcined byproducts and a subsequent expansion when the brick gets wet in use. In worse care scenarios a brick can structurally fail.

Another reason US brick producers avoid carbonates in mined raw materials is that by far the majority of brick produced in the US is a red bodied brick. Carbonates and in particular limestone even in very small quantities tend to bleach out the desired red color during the firing process yielding color blends undesirable in the marketplace.

Although brick making shares some similarities with "ceramic manufacturing" in that they are both high temperature processes, they are however very different in most respects. These include the sourcing of raw materials, material preparation, the forming methods used to create the product and the firing details of loading the product into kilns. In particular are the properties of the raw materials used to produce the products. The Subpart ZZ proposal appears to be primarily grounded on EPA's belief that all ceramics manufacturers have significant carbonate content in their raw materials. That is not the case for brick makers. In fact, it is incorrect for EPA to characterize the clays and shales utilized by USA brick producers as "carbonate-based materials."

Carbonates are considered a naturally occurring contaminate to be avoided in the mined material utilized by USA brickmakers. The Subpart proposal ZZ discussions hinge on carbonate contents of 10-15% (percentages cited in original rulemaking proposal) whereas tested averages for brick making materials average 0.58% (see attached table). These carbonate brick values are based on extensive material testing done by the NBRC (National Brick Research Center at Clemson University) encompassing tests on 238 mined brick materials over last 10 years. As will be discussed further below, the actual individual type of carbonate-based contaminants cannot be accurately identified in brickmaking materials in that they occur in such low percentages. With that being the case, the NBRC has relied on ASTM E1915- "Standard Test Methods for Analysis of Metal Bearing Ores and Related Materials for Carbon, Sulfur, and Acid-Base Characteristics" to calculate a carbonate percentage component. Using the assumed carbonate percentages on 85% Limestone and 15% Dolomite as used in the proposal discussion (although not proven for brick materials), the carbonate average for brick making materials in the USA is 0.58%. As such brick making carbonate percentages are only about 3.8-5.8% (0.58% divided by 10% and 15%

respectively) of the carbonate material percentages used in a justification of the inclusion of brick making in a Subcategory ZZ proposal.

Based on the historical determination of a 0.58% carbonate average in USA brickmaking materials, the inclusion of a CO_2e addition from a carbonate component would only increment the already required calculation of CO_2e resulting for Subcategory C fuel utilization by about 2.10% for an average brickmaking site. Based on brickmaking industry calculations the inclusion of a carbonate component would result in few, if any, additional sites not already reporting exceeding the 25,000 metric ton CO_2e reporting threshold. However, it would impose on all sites additional testing and measurement requirements to determine if they would in fact exceed the reporting threshold. The time, expense, coordination, and resources utilized for this testing, combined with the already minimal percentage of CO_2e from the brickmaking industry in total, does not justify the requirements the inclusion of Subcategory ZZ would impose on the brick making industry.

[See DCN EPA-HQ-OAR-2019-0424-0332-A2 for attached table of sample calculations]

Response: See section III.EE.2 of the preamble to the final rule for the EPA's response to this comment.

Commenter Name: Joseph Casper
Commenter Affiliation: Brick Industry Association (BIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0332-A1
Comment Excerpt Number: 9

Comment Excerpt: A limited number of brickmaking sites add small amounts of carbonates to some of their products for various reasons. For example, soluble salts, where present in some raw materials, produce “scum” on the product during the drying process. In such cases, the problem may be alleviated by adding barium carbonate to the brick body mix. In such cases, barium carbonate is added typically in the range of 0.05 to 0.1%. In addition, sodium carbonate sometimes is used to improve the uptake of water during the brick forming process. Here, the addition rate may be as high as 0.25%, Brick products are sometimes coated with limestone and other materials to produce various color and aesthetic characteristics. In this case an addition rate of 0.5% is typical. If these additional usages of carbonates are significant, they already would be reported under Subpart U.

Response: See section III.EE.2 of the preamble to the final rule for the EPA's response to this comment.

30.3 Comments on monitoring methodologies and quality assurance requirements

Commenter Name: Joseph Casper
Commenter Affiliation: Brick Industry Association (BIA)
Commenter Type: Industry Trade Association

Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0332-A1
Comment Excerpt Number: 7

Comment Excerpt: The speciation and measurement of the various carbonate materials as detailed in the proposed Subpart ZZ is not possible for the low concentration present in brickmaking raw materials. The discussed measurement protocol mentioned in this proposal cites "suitable chemical analysis methods include using an x-ray fluorescence standard method." Based on testing at the NBRC, the use of x-ray fluorescence requires a minimum of at least 2.0% of any single carbonate material to speciate and determine an amount. As mentioned, the total of all carbonates in brick making material is only 0.58% for all combined carbonates that may be present.

Were Subpart ZZ measurement required for brick makers, an alternate measurement of total carbonates such as ASTM E1915 and CO_2e calculation would be a necessary option. Alternately, a preferable and a simpler option, while still yielding sufficiently adequate reporting given the very low CO_2e emissions from brick making materials, would be to develop a default percentage of carbonate in brickmaking raw materials, or even simpler, an AP42 type metric allowing a direct calculation of CO_2e emissions per product throughput tonnage. The historical testing data previously discussed above could be the basis for this option development.

Response: See section III.EE.2 of the preamble to the final rule for the EPA's response to this comment.

30.4 Comments on reporting requirements

Commenter Name: Joseph Casper
Commenter Affiliation: Brick Industry Association (BIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0332-A1
Comment Excerpt Number: 8

Comment Excerpt: The Proposed Rule would require reporting on a unit-by-unit basis instead of facility wide reporting. That approach would impose unnecessary burdens on the brick industry. Natural gas billing, clay hauling deliveries, material preparation logs, etc. are done on a per-site basis. There is no benefit with respect to reporting CO_2e quantities by requiring reporting to be done on a per unit basis whereas a per site basis is sufficiently adequate in that it is the basis for determining if emissions exceed the 25,000 metric ton CO_2e threshold requiring reporting threshold.

Response: See section III.EE.2 of the preamble to the final rule for the EPA's response to this comment.

31.0 Comments related to the EPA's Implementation of Proposed Revisions to Part 98

31.1 Comments on implementation of changes for non-W subparts and new subparts

Commenter Name: Emily Sanford Fisher
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0164-A1
Comment Excerpt Number: 1

Comment Excerpt: Edison Electric Institute (EEI) members report their emissions using EPA's reporting program, including several subparts which EPA proposes substantive changes to. This includes subparts A (General Provisions), C (Stationary Fuel Combustion Sources), DD (Electrical Transmission & Distribution Equipment Use), W (Petroleum and Natural Gas Systems), and UU (Injection of Carbon Dioxide). EPA is also soliciting comment on expanding the program to include several new source categories, including energy consumption and carbon utilization. In order to allow EEI members sufficient time to analyze all aspects of the proposal and provide substantive and constructive comments, EPA should consider extending the comment period by 60 days, particularly given the range of proposed changes and the potential impact on member company reporting.

Response: The EPA provided a 45-day extension to the comment period for the 2022 Data Quality Improvements proposal. Refer to the July 19, 2022 Federal Register notice (87 FR 42988) that extended the comment period from August 22, 2022 to October 6, 2022. The EPA considers the comment period provided to be appropriate and to provide a meaningful opportunity to comment on the proposed rulemaking.

Commenter Name: George D. Baker
Commenter Affiliation: Energy Advance Center (EAC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0205-A1
Comment Excerpt Number: 4

Comment Excerpt: An EOR operator claiming 45Q tax credits should have all the information available to report under new Subpart VV in January 2023. If an EOR operator is not claiming 45Q tax credits, they continue to have the option to report under Subpart UU or Subpart RR. Consequently, EAC does not oppose establishing a January 2023 effective date for new Subpart VV.

Response: The EPA acknowledges the commenter's support for the implementation schedule. In the 2022 Data Quality Improvements Proposal, the EPA intended the proposed amendments to take effect starting January 1, 2023. The EPA subsequently explained in the publication of the

2023 Supplemental Proposal that the agency planned to consider the comments on the 2022 Data Quality Improvements Proposal and the 2023 Supplemental Proposal and publish any final rule(s) regarding both notices during 2024. The EPA reproposed at that time that facilities that would report under proposed subpart VV would implement the requirements beginning in RY2025. See section V to the supplemental proposed rule (88 FR 32905). The EPA is finalizing the schedule in the 2023 Supplemental Proposal as proposed, and the final amendments, including requirements for potential subpart VV reporters, will become effective on January 1, 2025. Reporters are required to implement these changes beginning with reports prepared for RY2025 and submitted March 31, 2026.

Commenter Name: John Fusch
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0166-A1
Comment Excerpt Number: 2

Comment Excerpt: It seems like there is a lot going on with this proposal, a lot of other comments are asking for additional comment period which is pretty logical.

Response: See response to comment EPA-HQ-OAR-2019-0424-0164-A1, Excerpt 1.

Commenter Name: Claire Chase
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0168
Comment Excerpt Number: 2

Comment Excerpt: There may be initial pushback on the changes in reporting and it is valid to allow for a longer comment period due to the complexity of the information and to allow for careful review. It is in our best interest for the industries affected to be successful in meeting the goals of the new requirements for RY2023. As time goes on and new technologies come to fruition this is an important piece of our goal for sustainability going forward.

Response: See response to comment EPA-HQ-OAR-2019-0424-0164-A1, Excerpt 1.

Commenter Name: Darrell K. Smith and David Biderman
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0237-A1
Comment Excerpt Number: 4

Comment Excerpt: The proposed rule will have a significant impact to all landfills, and it is not transparent on how previous years reporting will be impacted. Industry needs the opportunity to review EPA's strategy on how these revisions will impact previous year's submittals before any rule changes are finalized as revising previous reports places an unnecessary workload burden on the EPA and the regulated community. In addition to the burden of recalculating prior years emissions, retroactive revisions will create a great deal of confusion for stakeholders that rely on the GHG reports and raise questions about the validity of prior reporting efforts.

Furthermore, the emissions from the GHG Reporting Rule are used for other programs such as the US GHG Inventory and it is unclear in the proposal how EPA will implement such changes to align with different programs.

Therefore, we recommend EPA apply rule changes prospectively and not retroactively to prior year's reporting.

Response: The EPA provided a 45-day extension to the comment period for the 2022 Data Quality Improvements proposal on July 19, 2022 (87 FR 42988) to provide the public additional time for participation and comment. The EPA considers the comment period provided to be appropriate and to provide a meaningful opportunity to comment on the proposed rulemaking. In the 2022 Data Quality Improvements Proposal, the EPA intended the proposed amendments to take effect starting January 1, 2023. The EPA subsequently explained in the publication of the 2023 Supplemental Proposal that the agency planned to consider the comments on the 2022 Data Quality Improvements Proposal and the 2023 Supplemental Proposal and publish any final rule(s) regarding both notices during 2024. See section V to the 2023 Supplemental Proposal (88 FR 32905). The EPA is finalizing the schedule in the 2023 Supplemental Proposal as proposed, and the final amendments will become effective on January 1, 2025. Reporters are required to implement these changes beginning with reports prepared for RY2025 and submitted March 31, 2026.

The EPA is finalizing as proposed one exception to this schedule. The exception applies to the GWP amendments to Table A–1 to subpart A, which will apply to reports submitted by current reporters that are submitted in calendar year 2025 and subsequent years, *i.e.*, starting with reports submitted for RY2024 on March 31, 2025. The revisions to GWPs do not affect the data collection, monitoring, or calculation methodologies used by existing reporters. The EPA's e-GGRT generally automatically applies GWPs to a facility's emissions as reported in metric tons. Therefore, existing facilities do not have to conduct any additional measurement or monitoring activities for the reports submitted for RY2024.

Regarding the recommendation that EPA apply these changes prospectively and not retrospectively, we agree. We note that we did not propose and are not finalizing any revisions that would alter the previously existing requirements for past reporting years' reports for subpart HH and would not require resubmittal of prior year annual GHG reports.

Commenter Name: Charles Franklin
Commenter Affiliation: American Chemistry Council (ACC) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0290-A1
Comment Excerpt Number: 1

Comment Excerpt: The rule would significantly expand EPA's oversight over Part 98 reporters to operations well beyond the regulated parties' fence lines or control, and require disclosure of information relating to third-party vendors, sourcing decisions, and procurement arrangements. These issues raise immediate questions regarding the scope of EPA's authority under section 114 of the Clean Air Act, the Paperwork Reduction Act, and the prior authority used to develop the original Part 98 reporting program.

They also raise more complex, interwoven, and contentious questions under federal and state environmental, climate, energy, corporate, and competition law; other issues of administrative law and procedure; and factual and technical questions requiring consultation with Requestors' member companies and upstream supply chain partners.

The supplemental proposal's release also coincides with the development and implementation of several other cross-cutting proceedings directly relevant to this rule and affected stakeholders. At EPA, the Air Office recently released new data to the docket for its major proposed New Source Performance Standards and Emissions Guidelines for Greenhouse Gas Emissions from Fossil Fuel-Fired Electric Generating Units (EGUs), a rule that could disrupt and transform the U.S. energy sector, shape the growth of alternative energy technologies and markets, and influence corporate business strategy with respect to current and future operations.[4]

In addition, on June 30, 2023, OAR released a 647-page prepublication draft of a separate Part 98 proposed rule, Greenhouse Gas Reporting Rule: Revisions and Confidentiality Determinations for Petroleum and Natural Gas Systems.[5] This rule raises overlapping issues of policy and precedent that will require careful review and coordination by many of the same stakeholders reviewing the instant rule.

The Security and Exchange Commission is deliberating on extensive public comments related to its sweeping proposed Rules to Enhance and Standardize Climate-Related Disclosures for Investors, projected for release within the next three to four months. [6] The proposed rule included significant reporting and disclosure mandates on emissions from purchased electricity, heat, and other related business operations. (raising many of the same concerns implicated here). Separately, just last week, the International Trade Commission (ITC) announced its intent assess the greenhouse gas (GHG) emissions intensity of steel and aluminum produced in the United States.[7] Notably, recognizing the complexity of these issues, ITC has set a public hearing on this process for November 17, 2023, four months from the announcement of the action.

Looking beyond the federal government, on June 26, 2023, the International Sustainability Standards Board's (ISSB) release a new IFRS S2 Climate-related Disclosures Standard.[8] While voluntary in nature, it is likely to be very influential and the implications of the new standard must be considered by commenters and the Administration itself, to reduce the risk of conflict or duplication.[9]

Based on the significant and diverse legal and policy issues raised by the supplemental proposal; the need to consider the proposal in light of concurrent policy proceedings; and the inevitable resource limitations stakeholders face in participating meaningfully across multiple venues during the summer months, EPA should extend the comment period or stay this discretionary proceeding entirely pending further clarification and resolution of other related proceedings. Absent such an extension or stay, the Requestors and other stakeholders will be denied a reasonable opportunity to conduct the comprehensive and informed consultation and analysis needed to provide meaningful input in this proceeding, and EPA will be denied the information needed to make an informed, reasoned decision on this proposed rule.

For these reasons, the Requestors respectfully request that EPA grant a 60-day extension in this proceeding, realign the comment deadline to that established for the proposed Subpart W proposal, or stay further proceedings on the rule pending further analysis of the various proceedings listed above.

Footnotes

[4] 88 Fed. Reg. 33240 (May 23, 2023)

[5] Federal Register Notice was signed on June 30, 2023. Prepublication draft available at https://www.epa.gov/system/files/documents/2023-07/SAN%2010246%20Subpart%20W%20NPRM%20Premable%20and%20Rule_Admin.pdf.

[6] 87 Fed. Reg. 21334 (April 11, 2022).

[7] ITC, Greenhouse Gas Emissions Intensities of the U.S. Steel and Aluminum Industries at the Product Level, Inv. No. 332-598 (July 6, 2023).

[8] IFRS, IFRS S2 Climate-related Disclosures (June 26, 2023), available at https://www.ifrs.org/issuedstandards/ifrs-sustainability-standards-navigator/ifrs-s2-climate-related-disclosures/.

[9] Id.

Response: The EPA considers the 60-day comment period to be appropriate and to provide a meaningful opportunity to comment on the supplemental proposed rulemaking. Therefore, the EPA denied the request for an extension to the comment period. We also note that EPA posted a copy of the pre-Federal Register publication version of the notice on the EPA website on May 5, 2023, the same day the proposal was publicly announced. This provided the public with additional time to review the proposal prior to publication in the Federal Register. Including this opportunity for pre-publication review, the total amount of time for review and commenting amounts to 76 days. In addition, the EPA offered to meet with stakeholders upon request about the proposal for the remainder of the comment period. We believe these actions provided sufficient avenues for stakeholders to provide their data, views, and arguments.

For discussion of the legal authority for revisions in this final rule, which references the authority EPA has articulated for the existing GHGRP since initial promulgation, see section I.D of the preamble for the final rule and section 33.0 of this document.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council (ACC) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0325-A1
Comment Excerpt Number: 2

Comment Excerpt: While framed as a mundane supplemental proposal, the notice is quite extraordinary. Among other things, the rule would significantly expand EPA's oversight over Part 98 reporters to operations well beyond the regulated parties' fence lines or control and require a broad range of additional data collection, analysis, management, retention, and disclosure related to the reporter's offsite energy sourcing, acquisition, negotiated terms, procurement, and consumption practices.

An expansion of EPA authority of this significance merits more than a 60-day comment period. The rule raises complex, interwoven, and contentious questions under federal and state environmental, climate, energy, corporate, and competition law; other issues of administrative law and procedure; and factual and technical questions requiring consultation with Requestors' member companies and upstream supply chain partners. Such analysis and consultation are not feasible in the time provided, particularly given the overlap with the summer months and numerous other pressing policy proposals. Despite the Commentors' request for an extension, EPA declined to extend the comment period.

Response: See response to comment EPA-HQ-OAR-2019-0424-0290-A1, Except 1.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council (ACC) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0325-A1
Comment Excerpt Number: 9

Comment Excerpt: The supplemental proposal's release coincides with the development and implementation of several other cross-cutting proceedings directly relevant to this rule and affected stakeholders, including but not limited to:

- EPA's proposed New Source Performance Standards and Emissions Guidelines for Greenhouse Gas Emissions from Fossil Fuel-Fired Electric Generating Units (EGUs),[22]
- EPA's proposed Greenhouse Gas Reporting Rule: Revisions and Confidentiality Determinations for Petroleum and Natural Gas Systems.[23]
- The Security and Exchange Commission's proposed Rules to Enhance and Standardize Climate-Related Disclosures for Investors[24]

- The International Trade Commission (ITC) intended assessment of the greenhouse gas (GHG) emissions intensity of steel and aluminum produced in the United States.[25]
- The International Sustainability Standards Board's (ISSB) IFRS S2 Climate-related Disclosures Standard.[26]

EPA's development of new reporting standards should consider how these contemporaneous proceedings may duplicate, conflict with, or influence the timing and scope of any new mandate. These questions require feedback from public stakeholders. Unfortunately, such feedback is not practicable in the time allotted. In the absence of this information, EPA should, at a minimum, reopen the comment period for this rule if not delay future action pending further clarity with respect to the above proceedings and other market developments.

Footnotes

[22] 88 Fed. Reg. 33240 (May 23, 2023).

[23] Federal Register Notice was signed on June 30, 2023. Prepublication draft available at https://www.epa.gov/system/files/documents/2023-07/SAN%2010246%20Subpart%20W%20NPRM%20Premable%20and%20Rule_Admin.pdf.

[24] 87 Fed. Reg. 21334 (April 11, 2022).

[25] ITC, Greenhouse Gas Emissions Intensities of the U.S. Steel and Aluminum Industries at the Product Level, Inv. No. 332-598 (July 6, 2023).

[26] IFRS, IFRS S2 Climate-related Disclosures (June 26, 2023), available at https://www.ifrs.org/issued-standards/ifrs-sustainability-standards-navigator/ifrs-s2-climate-related-disclosures/.

Response: See response to comment EPA-HQ-OAR-2019-0424-0290-A1, Except 1. Additionally, the EPA disagrees with the commenter's assertion that the Agency must reopen the comment period to account for contemporaneous proceedings, including those that may be issued from other federal agencies or international organizations. Given that individual rulemakings or standards within and outside the agency may be subject to separate authorities, Congressional directives, or Court-ordered requirements; follow separate review processes and schedules; and are refined through the public comment and response process; or, in other cases, are based on requirements that are intended for reporting on voluntary basis or require reporting at a corporate or international level, the EPA reasonably provided a meaningful opportunity to comment and considered comments raised with reasonable specificity on the requirements of this proposed rule during the rulemaking's timeframe. As stated in section II of the preamble to the final rule, the EPA reviewed updates to emissions and default factors, improved emissions estimation and calculation methodologies, and identified additional sources of GHG emissions and supply, as well as the collection of additional data that could be compared to other national and international inventories, to consider changes that would benefit the GHGRP. The EPA considered each individual revision to each subpart for the reasons described in section III of the preamble to the final rule and in the preambles to the 2022 Data Quality Improvements Proposal and 2023 Supplemental Proposal; based on our review, and to the best of our knowledge, the information required by the revisions in this final rule would not duplicate or conflict with the rulemakings or standards identified. Further, we note that we are not taking final action on proposed amendments to add subpart B (Energy Consumption) at this time (see section III.B of the preamble for the final rule), thereby removing any potential overlap regarding the reporting

of purchased electricity, heat, and related data with the referenced standards. Concerns regarding requirements or the information that would be gathered by the specific proceedings cited by the commenter are outside of the scope of this rulemaking, and should be appropriately submitted to the specific authority on the action of concern.

Commenter Name: Joseph Casper
Commenter Affiliation: Brick Industry Association (BIA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0287-A1
Comment Excerpt Number: 2
Supportive Commenters: BIA

Comment Excerpt: Given that BIA members are directly impacted by this rulemaking, we plan to prepare and submit detailed comments. In the wake of the proposal, BIA members have been working to determine the anticipated impacts of the proposed reporting requirements and have begun to work with the Association to formulate comments. But it will be difficult for us to complete our work by July 21, the current deadline for submitting comments. The additional 30 days would help enable the Association to provide constructive comments on anticipated impact of the rule and offer ideas for adjustments in approach.

Response: See response to comment EPA-HQ-OAR-2019-0424-0290-A1, Except 1.

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0326-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA should set aside its initiative to create Subpart B and address long standing and emerging issues associated with the current elements of the GHGRP. When it was initiated, the GHGRP and the Inventory of U.S. Greenhouse Gas Emissions and Sinks (GHGI) presented a substantial challenge and required the redirection of resources to manage it. Most of IPAA's experience with the GHGRP relates to Subpart W. The primary sources for Subpart W emissions factors (EF) come from limited emissions studies in the mid-1990s. This history is common for the reporting subparts that comprise the GHGRP. Over the years, while EPA has made additions to increase reporting requirements, EPA has not fundamentally redone the analyses that created the initial emissions factors. Even now, this proposal is a supplement to a 2022 proposal to make major modifications to numerous subparts that comprise the GHGRP. EPA has yet to finalize those proposals, but if the changes proposed therein for Subpart W are any indication of the quality of the effort, it falls well short of meaningful revisions.

Response: The EPA acknowledges the commenter's concerns. The EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this action. See section I.C of the preamble to the final rule for a discussion of EPA's actions regarding subpart W. Additionally, the EPA is not taking final action on proposed amendments to add subpart B (Energy Consumption) at this time. See section III.B of the preamble for the final rule for additional information. As stated in section II of the preamble to the final rule, the EPA reviewed other updates to emissions and default factors, improved emissions estimation and calculation methodologies, and identified additional sources of GHG emissions and supply, as well as the collection of additional data that could be compared to other national and international inventories, to consider changes that would benefit the GHGRP. The EPA is finalizing certain improvements to the GHGRP as described in section III of the preamble to the final rule.

31.2 Comments on implementation of changes for subpart W (Petroleum and Natural Gas Systems)

Commenter Name: Marna McDermott
Commenter Affiliation: Exelon Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0153-A1
Comment Excerpt Number: 2

Comment Excerpt: We were surprised to see significant changes proposed to the Distribution Main Methane Emissions Factors, with a methodological approach different from that used in the U.S. GHG inventory. Specifically, the factors for cast iron and unprotected steel are proposed to be reduced significantly, while the factors for protected steel would be increased, resulting in protected steel having a higher emissions factor than unprotected steel. This is not consistent with our working assumptions and would have significant impacts on our understanding of our gas systems' emissions, as well as the reductions associated with pipe replacement projects, many of which have been encouraged by EPA's Natural Gas Star and Methane Challenge programs. We are requesting additional time to fully understand the underlying technical analysis that supports these changes and the impact of these changes on Exelon.

Response: The EPA provided a 45-day extension to the comment period for the 2022 Data Quality Improvements proposal to provide additional time for the public to participate and provide comment. Refer to the July 19, 2022 Federal Register notice (87 FR 42988) that extended the comment period from August 22, 2022 to October 6, 2022. The EPA considers the comment period provided, which commenced upon publication of the proposal in the Federal Register, to be appropriate and to provide a meaningful opportunity to comment on the proposed rulemaking. Consistent with Clean Air Act requirements, all data, information, and documents relied upon in the proposed rule was included in the docket on the date of publication of the proposed rule.

Additionally, the EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this final action. See section I.C of the preamble to the final rule for a discussion of EPA's actions regarding subpart W.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0154-A1
Comment Excerpt Number: 1

Comment Excerpt: By EPA's own analysis*, the Proposed Rule affects over 2,300 Subpart W reporters, reflects 504 new data elements, and 153 revised data elements. The proposed rule adds new sources, revises emissions factors, and adds new data collection requirements. A proposal of this magnitude requires more than the 60 days allotted for public comment. Specifically, the natural gas pipeline industry needs additional time to fully analyze and comment on the Proposed Rule due to the complexity of the proposal and the volume of new and revised data elements. Furthermore, some of the proposed emissions factors have increased by 150 to 400%. A change of this enormity requires ample time for commenters to comprehend the details of these changes and how they are justified by the Agency. Separately, if these emissions factors are indeed valid, EPA should consider how information resulting from the use of these factors will be presented to the public for potential increases in reported emissions. Lastly, the Proposed Rule puts the affected industry in an untenable position of commenting on regulatory requirements referencing certain draft regulations which have not become final through the EPA's rulemaking process. For example, the EPA's proposed "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review" proposed on November 15, 2021 (herein, "OOOOb proposal") is referenced in the Proposed Rule thirty-two times. Until INGAA understands the regulatory requirements of the OOOOb proposal (and new Emissions Guidelines under OOOOc), the industry cannot fully assess the impacts of the Proposed Rule.

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association (GPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0155-A1
Comment Excerpt Number: 1

Comment Excerpt: GPA Midstream Association ("GPA") respectfully requests an extension deadline of the public comment period for the U.S. Environmental Protection Agency's ("EPA") proposed rulemaking titled "Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule," 87 Fed. Reg. 36,920 (Jul. 21, 2022). The comment deadline is currently August 22, 2022, and we request a 30-day extension to September 21, 2022.

GPA notes that the proposed rule would also add new emission sources and reporting elements to the GHG reporting rule program and significantly change how some emissions are calculated. To accomplish the many goals of the proposed rule, EPA has included over 150 proposed changes that would directly impact natural gas gathering and boosting and onshore natural gas processing reporters. Given the extensive nature of the proposed regulatory changes, GPA requests additional time to review the proposal and its supporting materials. We believe that this additional time will allow GPA to conduct a more thorough review of the technical and policy issues raised by EPA's proposal and to ensure that our comments will provide EPA with useful information.

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Erin Kurilla
Commenter Affiliation: American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0156-A1
Comment Excerpt Number: 1

Comment Excerpt: The American Public Gas Association (APGA) respectfully requests a 60-day extension to the comment period for the proposed rule entitled "Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule." The current comments period allows stakeholders 60 days to comment following publication in the Federal Register and APGA respectfully requests an additional 60 days. APGA thank the Environmental Protection Agency (EPA) for sharing a prepublication version, but this additional time will allow APGA to evaluate the published version of the rule and all the technical supporting materials that were not available until the docket opened on June 21, 2022

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Pamela A. Lacey
Commenter Affiliation: American Gas Association (AGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0158-A1
Comment Excerpt Number: 1

Comment Excerpt: The American Gas Association ("AGA") AGA respectfully requests a 30-day extension to the comment period for the proposed rule entitled "Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule" published at 87 Fed. Reg. 36,920 on June 21, 2022. The notice of proposed rulemaking currently allows stakeholders 60 days to comment following publication in the Federal Register. AGA respectfully requests that EPA extend the comment period by an additional 30 days, to allow

interested parties a total of 90 days to comment following Federal Register publication, to allow time to evaluate both the published version of the proposed rule and preamble and the technical and other supporting materials that were not available until the docket opened on June 21, 2022.

While we appreciate that the 820-page pre-publication version of the explanatory preamble and proposed regulatory text were posted and available on EPA's website before EPA published the notice of proposed rulemaking in the Federal Register, as the agency warns, the pre-publication version "is not the official version" and should not be relied upon. We currently have only 60 days from the publication of the official notice of proposed rulemaking in the Federal Register to analyze the proposed changes relevant to AGA members in 40 C.F.R. Part 98 Subparts A, C and W and gather member input and consensus — during a period when subject matter experts will be taking summer vacations or doing double duty covering for colleagues. These same subject matter experts may also be called upon during this summer to evaluate EPA's anticipated supplemental notice of proposed rulemaking for 40 C.F.R. Part 60, Subparts OOOOa, b, and c methane new source performance standards (NSPS) and existing source guidelines. Moreover, the preamble for Subpart W frequently references the Technical Support Document for Subpart W (TSD) for further explanation, but the TSD and voluminous other materials were not made available until the official notice was published and EPA opened the rulemaking record on June 21, 2022. There are also implications of the EPA's GHG reporting rule proposals and their interrelation to the Securities and Exchange Commission (SEC) climate-related financial disclosures proposed rule that we will need to evaluate.

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Amy D. Kapuga
Commenter Affiliation: Consumers Energy Company
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0159-A1
Comment Excerpt Number: 1

Comment Excerpt: Consumers Energy Company (Consumers Energy) respectfully requests a 30-day comment period extension for the proposed rule entitled "Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule" published at 87 Fed. Reg. 36,920 on June 21, 2022. The notice of proposed rulemaking currently allows stakeholders 60 days to comment following publication in the Federal Register. Consumers Energy respectfully requests that EPA extend the comment period by an additional 30 days, to allow interested parties a total of 90 days to comment following Federal Register publication, to allow time to evaluate both the published version of the proposed rule and preamble and the technical and other supporting materials that were not available until the docket opened on June 21, 2022.

We are particularly concerned about the significant changes proposed to the Distribution Main Methane Emissions Factors, with a methodological approach different from that used in the U.S. GHG inventory. Specifically, the factors for cast iron and unprotected steel are proposed to be

reduced significantly, while the factors for protected steel would be increased, resulting in protected steel having a higher emissions factor than unprotected steel. This is not consistent with our working assumptions and would have significant impacts on our understanding of our gas systems' emissions, as well as the reductions associated with pipe replacement projects, many of which have been encouraged by EPA's Natural Gas Star and Methane Challenge programs. We are requesting additional time to fully understand the underlying technical analysis that supports these changes and the impact of these changes on Consumers Energy, including our emission reduction and sustainability plans. Accordingly, Consumers Energy respectfully asks EPA to extend the comment period by 30 days until September22, 2022.

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Jay Bower
Commenter Affiliation: Puget Sound Energy, Inc. (PSE)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0160-A1
Comment Excerpt Number: 1

Comment Excerpt: Puget Sound Energy, Inc. (PSE) respectfully requests a 30-day extension to the comment period for the proposed rule entitled "Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule" published at 87 Fed. Reg. 36,920 on June 21, 2022. The notice of proposed rulemaking currently allows stakeholders 60 days to comment following publication in the Federal Register. PSE respectfully requests that EPA extend the comment period by an additional 30 days, to allow interested parties a total of 90 days to comment following Federal Register publication, to allow time to evaluate both the published version of the proposed rule and preamble and the technical and other supporting materials that were not available until the docket opened on June 21, 2022. PSE is a member of the American Gas Association (AGA) and fully supports AGA's June 29, 2022 request for a 30-day extension to the comment period for all of the reasons enumerated in AGA's letter.

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Wendy Kirchoff
Commenter Affiliation: American Exploration and Production Council (AXPC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0162-A1
Comment Excerpt Number: 1

Comment Excerpt: The American Exploration and Production Council (AXPC) is writing to respectfully request additional time for stakeholders to thoughtfully consider and respond to Revisions and Confidentiality Determinations for Data Elements under the Greenhouse Gas

Reporting Rule (GHG Reporting Rule). AXPC understands the desire of Environmental Production Agency (EPA) to advance the public process; however, given the extent of the proposal and its technical complexity, we are respectfully requesting a minimum of 60 additional days for the public to provide comment on the proposal.

AXPC suggests that EPA would be well justified in granting additional time for public comment both in keeping with precedent of significant air rules and to enhance the quality of public comments and thus support the durability of EPA's final product. To date, the EPA Greenhouse Gas Reporting Program (GHGRP) remains the most comprehensive, comparable publicly reported inventory of emissions generated by company operations. Due to the intricate revisions proposed, the impact of changes to the program likely extends well beyond reporting compliance, which itself can be technically complex to analyze. The significance of potential changes necessitates a careful review of the extensive supporting technical documentation that has only just been made available with the publication of the proposal in the Federal Register.

Additionally, the occurrence of multiple rules currently in development by this administration at the same time governing the same sources and/or reporting of the same emissions further complicates the analysis of practical impacts and cost implications of the proposed changes. For example, the GHG Reporting Rule proposal references revisions to the New Source Performance Standards for the oil and natural gas production industry, which are still in the rule development phase at EPA. Similarly, the Security and Exchange Commission (SEC) has proposed a rule that would require disclosure of emissions which a company must consider and be able to publicly account for alongside its reporting to EPA under the GHGRP using potentially varying methodologies and assurance programs. Understanding the suite of interrelated impacts from these highly technical overlapping rules, as well as the detailed technical analysis required to thoughtfully respond to the specifics in just this GHG Reporting Rule proposal, reasonably necessitates that additional time is granted to adequately consider and respond.

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0163-A1
Comment Excerpt Number: 1

Comment Excerpt: This Proposed Rule includes 200-pages of text and thousands of pages of supporting material. We do not think the 60-day comment period is adequate to allow our members to fully review the Proposed Rule and supporting applicable material and provide meaningful comments on such a short timeline. The current U.S. economic situation, ongoing labor and supply chain issues, and the increasing demand for oil and natural gas presents additional challenges for The Alliance's members. As detailed below, we request an extension to the comment period by at least a minimum of 60-days. The Proposed Rule will have direct impacts on the Alliance's members. The Proposed Rule requires new data elements that may

require the implementation of equipment or systems capable of collecting such data. It may require more specialized data management and reporting processes to be implemented or it may require significant dedicated employee resources and oversight to ensure the information reported is consistent, reliable, repeatable, and defensible. Our members are subject to several requirements of the Proposed Rule including Subpart W. EPA's impact analysis shows that the revisions to Subpart W (Petroleum and Natural Gas Systems) will be the costliest of any Subpart. The Proposed Rule will take time to evaluate and analyze the potential costs impacts. As such, we think a 60-day comment extension is warranted.

The Proposed Rule incorporates many of EPA's proposed NSPS OOOO b/c rules; however, until those proposed rules are finalized, and our members have ample time to review it, we cannot reasonably or appropriately comment on the Proposed Rule without speculating or making assumptions. Delaying the comment period on this Proposed Rule is necessary until EPA finalizes its proposed NSPS OOOO b/c rules.

Given the consequences of the Proposed Rule on The Alliance's members, and the breadth, depth, and complexity of the information involved, The Alliance requests the comment period for the Proposed Rule be extended by a minimum of at least 60-working-days.

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Jenifer Ries
Commenter Affiliation: Atmos Energy Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0165-A1
Comment Excerpt Number: 1

Comment Excerpt: While we appreciate that the 820-page pre-publication version of the explanatory preamble and proposed regulatory text were posted and available on EPA's website before EPA published the notice of proposed rulemaking in the Federal Register, as the agency warns, the pre-publication version "is not the official version" and should not be relied upon. Moreover, the preamble for Subpart W, which proposes significant changes to the emission factors for distribution mains and services, frequently references the Technical Support Document for Subpart W (TSD) for further explanation. The TSD and voluminous other materials were not made available until the official notice was published and EPA opened the rulemaking record on June 21, 2022. Atmos Energy currently has only 60 days from the publication of the official notice of proposed rulemaking in the Federal Register to analyze the proposed changes and corresponding impacts to our various reporting requirements and operating practices, including implications of the EPA's GHG reporting rule proposals and their interrelation to the Securities and Exchange Commission (SEC) climate-related financial disclosures proposed rule and EPA's Natural Gas Methane Challenge program. Atmos Energy requests additional time to fully understand the array of changes being proposed, the technical analysis supporting the proposed changes, and the impacts of these changes on our operations. Moreover, additional time will facilitate robust stakeholder feedback that is necessary for a well-

supported and accurate rulemaking. Accordingly, Atmos Energy respectfully requests that EPA extend the comment period by 30 days until September 22, 2022.

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Marna McDermott
Commenter Affiliation: Exelon Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0153-A1
Comment Excerpt Number: 1

Comment Excerpt: Because of the complexity of the revisions to the rule and the many reporting elements that will be impacted, Exelon anticipates that significant time and resources will be required to understand the full set of interrelated impacts that will flow from the changes proposed. Thus, we request the comment period be extended from August 22, 2022 until at least September 22, 2022.

Response: See response to comment EPA-HQ-OAR-2019-0424-0153-A1, Excerpt 2.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 18

Comment Excerpt: Comments are due to EPA on or before October 6, 2022. It is reasonable to expect that there will be numerous comments in this docket for EPA to review and consider in determining the final rule, and it will not be possible to complete a final rulemaking before the end of the year unless EPA decides not to pursue extensive changes to Subpart W at this time. In some instances, data systems may need to be updated, internal processes and procedures written and implemented, and training of staff executed. Because revisions to the Subpart W methodologies are likely to result in significant reported increases in methane emissions, it is important that natural gas facilities be given appropriate time to assess the alternative procedures prior to their implementation.

Response: In the 2022 Data Quality Improvements Proposal, the EPA intended the proposed amendments to take effect starting January 1, 2023. The EPA subsequently explained in the publication of the 2023 Supplemental Proposal that the agency planned to consider the comments on the 2022 Data Quality Improvements Proposal and the 2023 Supplemental Proposal and publish any final rule(s) regarding both notices during 2024. See section V to the 2023 Supplemental Proposal (88 FR 32905). The EPA is finalizing the schedule in the 2023

Supplemental Proposal as proposed, and the requirements will become effective on January 1, 2025.

The EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this final action. See section I.C of the preamble to the final rule for a discussion of EPA's actions regarding subpart W.

Commenter Name: Charles E. Venditti
Commenter Affiliation: Countrymark Energy Resources, LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0181-A1
Comment Excerpt Number: 5

Comment Excerpt: Page 422 states, "We are proposing that these amendments would become effective on January 1, 2023 and that reporters would implement the changes beginning with reports prepared for RY2023 and submitted April 1, 2024."

EPA's requirement to begin compliance activities in January 2023 appears to be very challenging because EPA is accepting comments until October 6, 2022. EPA then needs to review and respond to the comments and develop a final rule after reviewing the comments. If this proposal was just a revision to existing activities, EPA's schedule could be considered very aggressive. With the proposal bringing new requirements on the Oil and Gas exploration and production industry, this schedule is not realistic. Our industry will need more time than EPA is proposing to be able to develop compliance programs to meet EPA's requirements. We currently have very little experience in this field and cannot develop it within the anticipated period. We recommend that compliance activities do not begin until January 2024 at the earliest.

EPA is requiring reports to be submitted on April 1 of each year. This date is in the middle of the busiest time of the year for many companies as they are completing other state and federal reporting activities. We recommend that EPA change the due date for the report to July 1 of each year. This change will provide sufficient time for companies to develop their reports and submit them to EPA without as many competing activities.

Response: Regarding the implementation schedule for the final rule, see response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18. The EPA did not propose and is not taking final action on the due date for the annual report, and so the commenter's request to change the due date of the annual report is outside of the scope of this rulemaking.

Commenter Name: Ryan Watts
Commenter Affiliation: Kentucky Oil and Gas Association (KOGA)
Commenter Type: Industry
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0182-A1
Comment Excerpt Number: 8

Comment Excerpt: Page 422 states, "We are proposing that these amendments would become effective on January 1, 2023 and that reporters would implement the changes beginning with reports prepared for RY2023 and submitted April 1, 2024."

EPA's requirement to begin compliance activities in January 2023 appears to be very challenging because EPA is accepting comments until October 6, 2022. EPA then needs to review and respond to the comments and develop a final rule after reviewing the comments. If this proposal was just a revision to existing activities, EPA's schedule could be considered very aggressive. With the proposal bringing new requirements to the Oil and Gas industry, this schedule is not realistic. Our industry will need more time than EPA is proposing to be able to develop new compliance programs to meet EPA's requirements. Our members currently have very little experience in this field and cannot develop competencies within the anticipated period.

EPA is proposing that reports be submitted on April 1 of each year. This date is in the middle of the busiest time of the year for our members as they are completing other state and federal reporting activities and preparing to start their drilling programs. We recommend that EPA change the due date for the report to July 1 of each year. This change will provide sufficient time for companies to develop their reports and submit them to EPA without other reporting activities competing.

Response: See response to comment EPA-HQ-OAR-2019-0424-0181-A1, excerpt 5.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 4

Comment Excerpt: If the final rule is indeed published in 2023, especially late 2023, the effective date should not be any earlier than January 1, 2024. The changes proposed are extensive and will require significant work to implement, work which cannot begin based on speculation while operators wait for the release of a final rule. Especially for midstream reporters, the GHGRP is an extremely complicated rule, and many midstream operators have had to build sophisticated data collection, calculation, and reporting systems to manage the huge workload this rule imposes and conduct thorough training in the field to ensure the data is properly collected. These data systems will have to be updated (and thoroughly tested) to accommodate the significant and substantial changes EPA has proposed for midstream operators. Further, due to the anticipated Securities and Exchange Commission ("SEC") rule relating to environmental, social and governance ("ESG") disclosures, changes to these systems will also require updates to provide stricter assurance and audit requirements. The SEC rule could have other implications when considering an appropriate effective date for this rule (for example, is

BAMM allowable in the context of SEC disclosures?). In fact, even proposed changes intended to simplify or streamline requirements will require modifications to a reporter's GHGRP program and data systems. Many of the data system changes cannot be made until EPA releases final updated reporting forms and XML schema.

It is important to emphasize that even if a reporter may possess the raw data that will be required by a regulatory change, the necessary data collection, calculation, and reporting work will not be trivial. The opposite will in fact be true in many cases. Given these circumstances, EPA cannot reasonably expect companies to significantly change their GHG reporting programs based on speculation as to what may be included in a final rule, to change their systems retroactively, or to make rapid changes to complex reporting programs. This is unduly burdensome and costly. For these reasons, GPA requests that EPA apply a reasonable effective date and period for implementation of any final rule that will accommodate industry's needs to adapt to EPA's regulatory changes.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 8

Comment Excerpt: The proposed rule amendments should not begin before calendar year 2024. If the final rule resembles the proposal currently under consideration, reporting companies will have to digest and prepare for a significant number of rule changes and new calculation and reporting requirements. As noted above, the need for accuracy in greenhouse gas reporting has taken on new and even greater importance given that the IRA ties methane fee assessments to Subpart W reporting. The important and complex work needed to revise company reporting systems to account for new reporting rule changes cannot reasonably be undertaken before the rule is finalized, because it would not be appropriate to expend time and resources to make changes based on proposed rule language that could change or not be finalized at all. Rather, the only reasonable way to begin making changes is when the new rule amendments are finalized and owners and operators have certainty as to the new requirements. Preparation to comply with calculation and reporting changes will entail a substantial amount of work as these requirements for the oil and gas industry tend to be detailed and complicated. Updating the complex data gathering and calculation / reporting systems that each company maintains will require a great deal of work and the process of reconfiguring and testing data systems will also take a substantial amount of time.

The EPA's current plan to publish a final rule in the latter part of 2022, to set an effective date for the new amendments of January 1, 2023, and to require reporting companies to implement the rule changes beginning with reports prepared for reporting year 2023 and submitted April 1, 2024,[3] would not give reporters enough time to revise and update their data collection systems to

account for the extensive changes being proposed. EPA seems to downplay this problem by stating that many of the proposed amendments are not expected to increase recordkeeping or reporting burdens and that some amendments are intended to streamline the data collection and reporting process. What this overlooks, however, is that any change — regardless of its ultimate impact — must be accounted for in a company's data collection system. The elements of such a system are complex and interconnected, and even a rule change that is designed to decrease reporting burden will create the need for system revisions, testing, and quality assurance. It is not a simple matter to reconfigure the types of systems needed to comply with the greenhouse gas reporting rules, particularly in our industry where the rule requirements are especially comprehensive and complicated.

Footnotes

[3] 87 Fed. Reg. 37023 (June 21, 2022).

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Curtis J. Winner
Commenter Affiliation: New Mexico Gas Company (NMGC)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0203-A1
Comment Excerpt Number: 2

Comment Excerpt: Provide more time for implementation: EPA should provide reasonable time — at least one year after publishing the final rule - to allow reporting entities an opportunity to establish systems to collect data to implement the new reporting requirements under Subpart W.

The timeline for implementing the proposed revisions is unreasonable and not feasible. Emission data collection processes are embedded in larger operations and maintenance procedures. Those procedures can only be modified within often rigorous Management of Change programs. Those programs are deliberately designed to require significant subject matter input and approval by employees or departments impacted by the change. It will not be possible for reporting entities to begin collecting emissions data in January 2023 in response to a final rule issued in the last quarter of 2022.

Accordingly, NMGC urges EPA to allow at least one year after publication of the final rule to begin collecting emissions data under the revised Subpart W. In other words, the new Subpart W requirements would apply to emissions beginning January of the year that is at least 12 months after publication of the final rule.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Not provided
Commenter Affiliation: Exelon
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0209-A1
Comment Excerpt Number: 1

Comment Excerpt: Provide adequate compliance lead time - The compliance deadline should allow for at least one year from the date of Federal Register publication of the final rule before new reporting is required. Because the proposed rule change would impact calculation methodologies, establishment of new sources, and recordkeeping and reporting requirements, sufficient time is required for adjustment of processes, procedures, and training.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Amy D. Kapuga
Commenter Affiliation: Consumers Energy Company
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0221-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA should allow a reasonable time for implementation. EPA's notice indicates the agency plans to issue a final rule by the end of 2022 and to require affected facility owners and operators to begin collecting data in January 2023 for reports to be filed in 2024. A requirement to immediately modify the data collection procedures after the new requirements are finalized is far from a reasonable expectation. It will not be possible for reporting entities to begin collecting emissions data in January 2023 in response to a final rule issued in the last quarter of 2022. Given the complexity and extensiveness of the proposal, which is likely to be reflected in the final rule, it would not be feasible for reporting entities to evaluate the requirements and establish systems to accurately collect the required data elements within such a short period of time. A similar situation may arise if EPA postpones finalizing the proposed rule and final issuance occurs shortly before the reporting deadline. EPA should address the feasibility of implementation timing.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1

Comment Excerpt Number: 2
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: EPA's ambition to finalize this rulemaking and require all revisions to be in effect by January 1, 2023 is not feasible. Based on recent member experiences, and the breadth and depth of the revisions to the reporting program proposed by EPA, most companies will not be able to revise their environmental data management systems to adopt the proposed revisions to include all changes before January 1, 2023. Implementation of the proposed changes will necessarily start at the field level with re-configuration of measurement systems to capture the required data parameters at mandated frequency. Quality assurance efforts associated with field data inputs as well as system transmittal automation are also significant to ensure data integrity prior to coding in the calculation processors. Recent member experiences implementing changes to environmental data management systems can take between three months to a year. As operators cannot change reporting methods during a reporting year, EPA should delay the implementation of any finalized revisions to the reporting program until reporting year 2024.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0230-A1
Comment Excerpt Number: 4

Comment Excerpt: In the proposal, EPA indicates it wants to have its proposed revisions to Subpart W applicable by January 1, 2023 — less than 90 days from now. This is wholly unrealistic given the time necessary to assess the comments on the proposal. But, as described above, it is a misdirection of effort when EPA has to revisit Subpart W and revise it by the end of 2024. The concept of finishing this proposal also fails to reflect the interaction between Subpart W and the EPA New Source Performance Standards and Emissions Guidelines for oil and natural gas production operations that EPA plans to finalize in mid-2023.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 2

Comment Excerpt: If EPA does not withdraw the Subpart W portion of the Proposed Rule as recommended above, then EPA should allow a reasonable time for implementation. EPA's notice indicates the agency plans to issue a final rule by the end of 2022 and to require affected facility owners and operators to begin collecting data in January 2023 for reports to be filed in 2024. The Associations believe that this aggressive timeline is unreasonable and not feasible. Emission data collection processes at natural gas distribution systems are embedded in larger operations and maintenance procedures. Those procedures can only be modified within often rigorous Management of Change programs. Those programs are deliberately designed to require significant subject matter input and approval by employees or departments impacted by the change. A requirement to immediately modify the data collection procedures after the new requirements are finalized is far from a reasonable expectation. It will not be possible for reporting entities to begin collecting emissions data in January 2023 in response to a final rule issued in the last quarter of 2022. Given the complexity and extensiveness of the proposal, which is likely to be reflected in the final rule, it would not be a reasonable expectation for reporting entities to evaluate the requirements and establish systems to accurately collect the required data elements within such a short period of time.

That task will be further complicated by the interplay of the new methane fee requirements in Clean Air Act (CAA) section 136, recently enacted in the IRA. Section 136 imposes a methane fee based on emissions reported under Subpart W, which adds more complexity. Although emissions during 2023 will not be subject to the methane fee, beginning in 2024, emissions for some sources will be potentially subject to the fee. New section 136 also requires EPA to revise Subpart W to facilitate calculating the methane fee, which adds further uncertainty as to the structure of the final rule.

Accordingly, the Associations urge EPA to allow at least one year after publication of the final rule to require affected source owners and operators to begin collecting emissions data under the newly revised Subpart W. In other words, the new Subpart W requirements would apply to emissions beginning January of the year that is at least 12 months after publication of the final rule. It would be a more efficient use of company resources to design systems and procedures once, than to chase a moving target of evolving regulatory requirements.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA Should Provide a Reasonable Time — At Least One Year After Publishing the Final Rule — to Allow Reporting Entities an Opportunity to Establish Systems to Collect Data to Implement the New Reporting Requirements under Subpart W.

If EPA does not postpone the Subpart W portion of the Proposed Rule as recommended above, then EPA should allow a reasonable time for implementation. EPA's notice indicates the agency plans to issue final rule by the end of 2022 and to require affected facility owners and operators to begin collecting data in January 2023 for reports to be filed in 2024. The National Grid Companies believe that this aggressive timeline is unreasonable and not feasible. Emission data collection processes at natural gas distribution systems are embedded in larger operations and maintenance procedures. Those procedures can only be modified within often rigorous Management of Change programs with pipeline safety as their top priority. Those programs are deliberately designed to require significant subject matter input and approval by employees or departments impacted by the change. A requirement to immediately modify the data collection procedures after the new requirements are finalized is unreasonable. It will not be possible for reporting entities to begin collecting emissions data in January 2023 in response to a final rule issued in the last quarter of 2022. Given the complexity and extensiveness of the proposal, which is likely to be reflected in the final rule, it would not be a reasonable expectation for reporting entities to evaluate the requirements and establish systems to accurately collect the required data elements within such a short period of time.

Accordingly, the National Grid Companies urge EPA to allow at least one year after publication of the final rule to require affected source owners and operators to begin collecting emissions data under the newly revised Subpart W. The new Subpart W requirements would thus apply to emissions beginning January of the year that is at least 12 months after publication of the final rule.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 1

Comment Excerpt: The compliance deadline should be delayed to allow for a minimum of one year from the publication of the final rulemaking in the Federal Register and begin on the date of the beginning of the next calendar year.

We understand EPA's desire to collect the newly required GHG emissions data as soon as possible, starting at the beginning of January 1, 2023. However, this timeline is neither reasonable nor likely even possible for the more than 10,000 facilities that the agency estimates are affected by the rule changes. If the agency were to rush to finalize the rule prior to the end of this calendar year as proposed, the agency would not be able to adequately consider and engage the public on the many issues in the comments anticipated on the proposal.

The technical nature of these requirements, and the diversity of facilities that report under the program, requires tailoring the reporting requirements. Adequate time for public review of the proposed requirements is needed to fully consider to the differences in facilities and operations

across different industrial sectors. No two industrial facilities are completely alike, even if they are owned or operated by the same company.

In addition, it would be arbitrary and unreasonable to create impossibly short deadlines that entities would not be likely to meet, due to limited available resources at the end of a calendar year and expected high demand for the same pool of expert consultants, emissions monitoring companies, and data acquisition and handling system companies. Time is needed to identify emissions and the best monitoring or estimation methodology. Time is also necessary to establish internal company systems and protocols, install capital equipment, and/or make software upgrades. Even if the agency would allow for facilities required to conduct new monitoring to use best available monitoring methods (BAMM) for annual reports, it would not alleviate the need to make changes to comply with all the other revisions included in the proposed rule.

For the facilities that have the option to use one of EPA's BAMM, sufficient time would be needed to review and then implement any monitoring and reporting changes. The BAMM document is very technical in nature and is issued following the rulemaking update that contains specific, often unique monitoring methods for each industry. Rushing the rulemaking process will not only increase the likelihood of errors in EPA's BAMM methods but will also cause an inefficient use of thousands of companies' resources, such as by alerting the agency of significant errors or other needed corrective revisions.

We recommend that the agency require compliance with the rule no earlier than the beginning of the calendar year that allows for at least one year of compliance with the current rule following the publication of the final new rule in the Federal Register.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA's proposed revisions to its GHGRP do not satisfy the requirements of a "Proposed Rule" as it references requirements from NSPS OOOOb and EG OOOOc, which no regulatory text has been provided for and presumably doesn't yet exist. EG OOOOc specifically, will require states to develop implementation plans and rules for OOOOc emissions guidelines, and have approved State Implementation Plans from EPA, this will likely take years. Affected stakeholders, such as the regulated community, are unable to review and provide adequate comments on the proposed GHGRP revisions. Given this, and the low likelihood that EPA will be able to finalize the rule by YE 2022, the proposed effective date of January 1, 2023 for RY 2023 is unreasonable and unduly burdensome. AIPRO strongly encourages EPA to withdraw the current proposed GHGRP revisions at Docket ID No. EPA-HQ-OAR-2019-4024. At a minimum, the agency should delay the effective date until January 1, 2024.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 5

Comment Excerpt: Reliance on Proposed Standards under Section 111. As a general matter, the proposed rule's reliance on aspects of the proposed new source performance standards ("NSPS") and emissions guidelines for existing oil and natural gas sources under section 111(b) and 111(d), respectively referred to as proposed subpart OOOOb and proposed subpart OOOOc, create logistical and legal concerns for the proposed rule.

The Clean Air Act ("CAA") and the most fundamental tenets of administrative law require EPA to propose revisions to the GHGRP that provide adequate notice to interested parties. The Administrative Procedure Act ("APA"), for instance, requires that a notice of proposed rulemaking include "either the terms or substance of the proposed rule or a description of the subjects and issues involved."[8] Under this standard, an agency's proposal must fairly apprise interested persons of the subjects and issues of the rulemaking.

Section 307(d)(3) of the CAA imposes even more stringent requirements than the APA. It requires a notice of proposed rulemaking to include "the factual data on which the proposed rule is based;" "the methodology used in obtaining the data and in analyzing the data;" and "the major legal interpretations and policy considerations underlying the proposed rule."[10] The D.C. Circuit has explained that the CAA thus requires EPA to issue a proposed rule and to provide a detailed explanation of its reasoning at the proposed rule stage.

Until EPA's OOOOb and OOOOc requirements have been made final, any proposed rule that relies on their requirements cannot reasonably provide notice of "the terms or substance of the proposed rule" or "the major legal interpretations and policy considerations underlying the proposed rule." On the contrary, the references in the proposed revisions to the GHGRP are in effect mere placeholders for whatever law or policy is ultimately made in the related proposals for OOOOb and OOOOc.

Even as a practical matter, EPA should refrain from taking final action on its proposed revisions to subpart W until it has finalized OOOOb and OOOOc and allowed interested parties with an opportunity to fully comment on how those final rules requirements might be reflected in or impact implementation of the GHGRP. Acting to finalize the GHGRP revisions first risks predetermining (or giving the appearance of predetermining) the outcome of the methane and volatile organic compounds ("VOCs") rulemaking or premising the revisions at issue in this rulemaking on provisions that remain subject to change. Either alternative is problematic.

EPA can avoid these issues entirely by taking final action on OOOOb and OOOOc prior to finalizing this rulemaking. Should the OOOOb or OOOOc requirements change in any

substantive respect relevant to the GHGRP, EPA should reopen these proceedings for additional public comment. Taking such an approach will ensure that EPA complies with the law and adopts sound public policy.

Response: Regarding the implementation schedule of this final rule, see response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 9

Comment Excerpt: We note that the current proposal repeatedly references the NSPS standards in proposed Subparts OOOOb and OOOOc and is designed to complement and align with those standards.[4] However, those proposed NSPS provisions are still pending, with a new round of proposed revisions expected in the future. It would not be appropriate to finalize the greenhouse gas reporting rule proposal before finalization of the OOOOb/OOOOc provisions to which the reporting rule proposal makes reference and in part is based upon. Finalizing the reporting rule amendments prior to finalization of Subparts OOOOb and OOOOc would be premature, would risk confusion in the event that the NSPS standards as finalized are different from the current proposal, and would run the risk of improperly influencing EPA's decision-making process regarding the pending NSPS proposals by making it more likely that the proposals are finalized as proposed, so as to be consistent with the rule amendments.

In light of the extension of the comment period to October 6, 2022, it is likely that a final greenhouse gas reporting rule will be published toward the end of 2022 at the earliest. Given the time and effort that will be expended in response to the final rule, and the fact that the pending OOOOb and OOOOc amendments are unlikely to be finalized before the end of the year, we believe that the effective date of the new reporting rule amendments should be January 1, 2024 at the earliest.

Additional reasoning to delay the final rule comes from the IRA requirement that the EPA revise Subpart W by August 2024 to ensure that reporting is based on empirical data.[5] TPA encourages the EPA to delay the finalization of this new rule to align with the additional revisions that will be needed to comply with the IRA, so that there is a single rulemaking process. This should reduce the time and burden that would otherwise be expended by finalization of the current proposed revisions, closely followed by a second, [RA-mandated rulemaking process to incorporate emission calculations based on empirical data.

Footnotes

[4] See, *e.g.*, 87 Fed. Reg. 36962 (June 21, 2022) (EPA states that it is "proposing revisions to certain requirements in subpart W relative to the requirements proposed for NSPS OOOOb and the presumptive standards proposed in the EG OOOOc").

[5] 42 U.S.C. § 7436(h).

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Not provided
Commenter Affiliation: Exelon
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0209-A1
Comment Excerpt Number: 2

Comment Excerpt: Delay amendments to align with other anticipated changes- The proposed amendments to Subpart W were proposed, in part, to adjust for proposed updates to the New Source Performance Standards and new Emissions Guidelines for the Oil and Natural Gas Industry (40 CFR 60 Subparts OOOOa, OOOOb, and OOOOc) published in the Federal Register on November 15, 2021 (86 FR 63110). Those revisions have not yet been finalized, and an associated fact sheet indicates that EPA will issue a Supplemental Proposal to the Part 60 regulations in 2022. Finalizing Subpart W changes should be delayed until after the amendments to Part 60 have been finalized.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA references the proposed NSPS OOOOa/b/c rules in the Proposed Rule. EPA's proposed NSPS OOOOa/b/c rule did not include any proposed regulatory language and as such it prevented our members from providing fully informed comments. The Alliance submitted comments expressing significant concerns with that proposed rule. Until EPA's proposed NSPS OOOOa/b/c rules are available for review and comment, it is unclear and confusing as to how those proposed changes will impact the changes provided in this Proposed Rule. Until our members have time to review the proposed NSPS OOOOa/b/c rules, we cannot reasonably or appropriately comment on the proposed GHGRR rule without speculating or making assumptions.

The Alliance requests EPA to defer the Proposed Rule and allow our members to review and provide comment on the NSPS OOOOa/b/c rules before proceeding with this Proposed Rule.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 3
Supportive Commenters: API, AXPC, IPAA

Comment Excerpt: We are concerned that certain portions of the proposed revisions are dependent on the proposed rule entitled "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review" (86 Fed. Reg. 63310 (Nov. 15, 2021)). While EPA has repeatedly indicated that it is within the agency's authority to revise reporting requirements without a final rule, we are concerned that changes made to the cited proposed regulation before finalization could require significant changes to the revisions proposed for this program. We urge EPA to delay the implementation of proposed revisions under subpart W, especially those relating to the proposed methane rulemaking referenced above, until a final rule is published. As EPA is aware, subpart W provides data upon which EPA can develop emission regulations. Whereas the existing and proposed methane standards establish emission and operation standards, subpart W represents a reporting program for operators to estimate the emissions associated with the same applicable sources under the methane rule. Until a final rule has been published, EPA and operators of facilities reporting under subpart W and subject to the proposed methane rule or the existing OOOOa standard cannot be sure that the approaches and requirements related to equipment leaks, equipment leak surveys, and monitoring plans in the final rule will be aligned with the proposed methane rule until the final rule is published. Inconsistencies between subpart W requirements and the proposed methane emission standards may impede a streamlined approach to comply with both sets of rules. Changes to the proposed methane standard when published as a final rule may increase the reporting burden on operators associated with the proposed revisions to subpart W. In addition, operators will require more time and resources to train staff to properly deploy OGI and other leak detection methods that may be required by the proposed methane standard and the proposed revisions to the reporting program.

To address these issues in the near term, the Industry Trades support EPA's proposal to allow for use of BAMM in the first reporting year. In addition to needing time to review comments submitted by stakeholders and to revise proposed text based on those comments, which may take months, publication of the final rule will also be subject to any delays that occur in the effort to have the final rulemaking published in the Federal Register. While EPA may work with as much speed and efficiency as possible, publication of a large rulemaking such as the proposed revisions to the reporting program may add additional weeks to the timeline. EPA's proposed methane standards for new and existing sources will not change based on the proposed revisions to the reporting program, nor will the delay in implementation impact the newly established methane fee created by the Inflation Reduction Act of 2022.

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 16

Comment Excerpt: It is difficult for INGAA to fully assess the requirements and impacts of the Proposed Rule, because the underlying compliance requirements of OOOOb and OOOOc are not known.

On November 15, 2021, EPA proposed preamble language entitled "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review" (hereinafter, Proposed OOOOb,c)[25]. As INGAA noted in INGAA's comments to Proposed OOOOb,c (hereinafter, INGAA OOOO Comments, provided as Attachment 1), "the absence of proposed regulatory text makes it difficult to provide meaningful comments on proposed OOOOb and OOOOc." Proposed OOOOb,c indicated that EPA would be issuing a supplemental proposal with proposed regulatory text; however, as of the date of publication of the Proposed Rule, EPA has not issued the supplemental proposal with proposed text. Until INGAA understands the requirements of subparts OOOOb and OOOOc, INGAA cannot fully assess the requirements and impacts of the Proposed Rule with respect to GHG emission data accuracy, quality, and representativeness.

INGAA recommends that EPA withhold references to 40 CFR part 60 subparts OOOOb and OOOOc requirements until the regulatory text has been promulgated. At that time, EPA should once again seek stakeholder comment and then amend the rule to include appropriate references to 40 CFR part 60 subparts OOOOb and OOOOc.

Footnotes

[25] 86 Fed, Reg, 217 (November 15, 2021)

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A2
Comment Excerpt Number: 22

Comment Excerpt: [Commenter resubmitted their January 15, 2022 comments to the proposed "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review," which was

published in the Federal Register on November 15, 2021 (Docket ID No. EPA-HQ-OAR-2021-0317) as reference to EPA-HQ-OAR-2019-0424-0224-A1, Excerpt 16.]

Response: See response to comment EPA-HQ-OAR-2019-0424-0185-A1, Excerpt 18.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 21

Comment Excerpt: EPA has not provided adequate notice and opportunity for reporting entities to evaluate and comment on how portions of the Proposed Rule relate to CAA section 111 methane standards for the oil and natural gas sector that the public has not yet seen. EPA published a notice of proposed rulemaking on Nov. 15, 2021, that was more akin to an advance notice of proposed rulemaking, given that it did not include a proposed rule text but only provided a preamble discussion of the changes the agency is contemplating for the new source performance standards (NSPS) and existing source guidelines under to-be-proposed 40 C.F.R. Part 60, Subparts OOOOb and OOOOc. We have yet to see the methane standards proposed rule, let alone the final rule. EPA's methane standards notice in November 2021 indicated that sources inside and including the LDC custody transfer station would not be affected sources, as under the current Subpart OOOOa, but this is unknown until the actual proposed and final rules are made available. Some natural gas distribution utilities also operate state-regulated intrastate natural gas transmission pipelines, natural gas storage facilities, and compressor stations as part of their gas utility systems. A few even operate interstate transmission pipelines. These facilities could be subject to yet unknown requirements under the new methane standards. In the Proposed Rule, EPA proposes to revise "the calculation methodology for equipment leaks in Subpart W so that data derived from...monitoring conducted under NSPS OOOOb or the applicable approved state plan... would be used to calculate emissions."[11] EPA similarly proposes that the Subpart W calculation methodologies will be determined by the yet to be disclosed methane standards rule for Underground Storage facilities, LNG Storage facilities, and LNG Import-Export facilities. There is not sufficient information or notice of these undisclosed calculation methodologies to allow for adequate opportunity to comment. But the uncertainty caused by the scope of this unknown requirement adds further difficulty for gas utilities trying to understand what is required and to develop and deploy systems and procedures to collect and report emissions data.

Footnotes

[11] 87 Fed. Reg. at 36,977.

Response: The EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this final action. See section I.C of the preamble to the final rule for further discussion of EPA's actions related to subpart W.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 6

Comment Excerpt: Williams has concerns that the Proposed Rule repeatedly references requirements from OOOOb or OOOOc rules that do not yet exist and have not been formally proposed, much less finalized. It is inappropriate for the Agency to discuss or set forth cross-references in the regulatory language to non-existent rules. Doing so prevents Williams and the public at large from having the ability to fully evaluate and comment on the potential impact such rulemaking will have. This approach is contrary to the protections and processes contemplated and required in the Administrative Procedure Act. The EPA should refrain from finalizing the Proposed Rule with references to regulatory provisions the public has not seen or that have not been through the appropriate administrative review process.

Response: See response to comment EPA-HQ-OAR-2019-0424-0236-A1, Excerpt 21.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 14

Comment Excerpt: MSC recommends that the final GHGRP recognize and not overlap, conflict or be redundant with requirements for sources under other programs. These programs include updates to the Oil and Gas New Source Performance Programs, the Inflation Reduction Act's methane requirements, and federal and state operating permit programs.

Response: See response to comment EPA-HQ-OAR-2019-0424-0236-A1, Excerpt 21.

Commenter Name: Brian S. Taylor
Commenter Affiliation: Project Canary, PBC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0186-A1
Comment Excerpt Number: 5

Comment Excerpt: As the Biden Administration advances an "all-of-government" approach to address climate change and accelerate decarbonization of hard to abate sectors, two other federal agencies, in addition to the EPA, are pursuing regulatory actions which address some aspects of methane emissions and changes in methods of emissions measurement and measurement of climate impacts of the oil and gas industry — the Department of Interior Bureau of Land Management proposed Waste Prevention Rule, and the Securities and Exchange Commission Climate-Related Disclosures rule. As Federal agencies advance these rulemakings, we strongly encourage EPA, BLM and the SEC to closely coordinate the compliance methods and practices required for these rules to reduce or eliminate duplication.

Response: See response to comment EPA-HQ-OAR-2019-0424-0236-A1, Excerpt 21.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 1

Comment Excerpt: The importance of public trust and reliability is where the proposed rule intersects with the rulemaking for Environmental, Social and Governance (ESG) reporting at the Securities and Exchange Commission (SEC). While Alliance members already report emissions within the GHGRP, a significant portion of our membership also publicly discloses emissions data through sustainability reporting to inform the public and our shareholders. While the SEC is pursuing options to mandate this type of reporting through its ESG rulemaking, it is important that wherever possible the methodologies employed within the GHGRP are consistent with the requirements of the SEC's rules. This not only highlights the need for EPA to collaborate with the SEC in developing their rules, but, more importantly, it also highlights the importance of avoiding large swings in emissions data that result from methodological changes. The SEC rulemaking is intended to provide the public and shareholders with information to allow them to make informed decisions about the environmental performance of their investments, but that information is only valuable when it is both accurate and consistent. Large changes from year to year, either in individual emission factors or overall emissions values provides the opposite for stakeholders, both putting at risk their trust in the system, and causing confusion over whether the values are useful in decision making. EPA must carefully consider how the changes in values for emission factors, both positive and negative, create discrepancies between legacy values and current values. The Alliance urges EPA to update data with new values when there is sufficient evidence to do so and to communicate how these changes may adjust and compare to legacy reported data.

EPA also needs to make clear that differences between what is reported in the GHGRP's Facility Level Information on Green House Gases Tool (FLIGHT) and company sustainability reports, especially those published in the past, does not represent an intentional misrepresentation of data.

Response: See response to comment EPA-HQ-OAR-2019-0424-0236-A1, Excerpt 21.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 12

Comment Excerpt: Assuming the Agency does not forgo finalizing the Proposed Rule to coordinate revisions to Subpart W in light of the congressional mandate in the IRA, with the pending U.S. Securities and Exchange Commission Rule on ESG disclosures and its associated uncertainty regarding third-party audits and reporting schedule, the effective date of the Proposed Rule should be January 1, 2024. Associated annual reporting for Reporting Year 2024 should be due on March 31, 2025. This timeline will allow reporting companies sufficient time to modify their reporting programs, conduct internal training, and coordinate with their SEC third-party auditors.

Response: See response to comment EPA-HQ-OAR-2019-0424-0236-A1, Excerpt 21.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 8

Comment Excerpt: GPA strongly encourages EPA to provide the draft XML schema and draft revised reporting forms to reporters for review and testing. In the past, doing so has led to the identification of errors and resulted in significant improvements. Additionally, final forms and schema should be published at least 6 months prior to the due date of the first affected reports. Many midstream operators are reporting data for hundreds of assets and have thus developed automated processes for populating forms and/or schema, which will need to be updated to reflect the extensive changes EPA has proposed. In the past, EPA has often not released schema until late January *i.e.*, mere weeks before the reporting deadline, which has compounded challenges during the demanding annual reporting process.

Response: This comment on the development of draft XML schema and reporting forms published to the EPA's Greenhouse Gas Reporting Program website is outside the scope of the current rulemaking. The EPA will may consider this comment in future updates to e-GGRT.

Commenter Name: Jose Godoy
Commenter Affiliation: American Petroleum Institute (API)

Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0288-A1
Comment Excerpt Number: 1
Supportive Commenters: BIA

Comment Excerpt: Because this is a complex rule with an impact on many different reporting segments within the oil and natural gas industry, API is requesting that the comment period be extended by 60 days to September 19, 2023, to ensure that API and all interested stakeholders have a full and fair opportunity to comment. This extension is necessary to allow API to present EPA with relevant information necessary to support an informed, reasoned, and defensible final rule. Given the importance of this proposal, API needs additional time and opportunity to review the extensive supporting documentation that has only just been made available with the publication of the preamble in the Federal Register.

These supporting documents (*e.g.*, Technical Supporting Document for Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule; Proposed Rule - Petroleum and Natural Gas Systems) provide the scientific basis and details for revisions that EPA has proposed in the preamble. As such, these documents require close review and consideration to ensure that the data supports EPA's proposed revisions. In light of the significant impact the proposed revisions could have on API members, a 60-day extension of the comment period is warranted and will provide the necessary time to provide detailed comments best-suited to assist EPA. We appreciate your prompt consideration of this request for an extension of the comment period.

Response: See response to EPA-HQ-OAR-2019-0424-0290-A1, Excerpt 1 and EPA-HQ-OAR-2019-0424-0236-A1, Excerpt 21 for the EPA's response to this comment.

Commenter Name: Angie Burkhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0320-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA currently has three proposed rules on the GHGRR that have not been finalized: EPA's proposed rule (87 Fed. Reg. 36920, June 21, 2022)(200 pages), this Supplemental Proposed Rule (96 pages) and EPA's recently issued amendments (647 pages) for Subpart W for the petroleum and natural gas systems. Taken together, the proposed GHGRRs are expansive and provide significant uncertainty has to how they collectively build upon the other that significantly increases the burdens and costs on our members (see comments in Section II and III below). In addition, EPA's proposed New Source Performance Standards for new and existing oil and gas sources (NSPS a/b/c), integral to the GHGRR, are still not finalized, adding an additional level of regulatory uncertainty. We request EPA provide supplemental information for comment and review that clearly outlines the requirements of each rule on Subpart W

reporters, how all these rules collectively function together and a detailed cost impact analysis so that our members can provide fully-informed comments.

Response: See response to EPA-HQ-OAR-2019-0424-0236-A1, Excerpt 21 for the EPA's response to this comment. The final rule consolidates amendments from the 2022 Data Quality Improvements Proposal and the 2023 Supplemental Proposal—including revisions to update the GWPs in Table A–1 to subpart A of part 98 that affect the number of facilities required to report under part 98; revisions to implement five new source categories or to expand existing source categories that may require facilities to newly report or to report under new provisions; and revisions to add new reporting requirements to a number of subparts that will improve the quality of the data collected under part 98. Although the EPA proposed amendments to subpart W in the 2022 Data Quality Improvements Proposal, this final rule does not address implementation of these revisions to subpart W, which the EPA is reviewing in concurrent rulemakings. Additionally, as stated in section III.B of the preamble to the final rule, the EPA is not taking final action on its proposed amendments to add a source category for collection of data on energy consumption (subpart B) at this time. Accordingly, the impacts of the final rule generally reflect those costs to facilities or suppliers reporting under other subparts of part 98 for which we are finalizing revisions (see section VII of the preamble to the final rule for additional information). For subpart W, these impacts only include those costs to facilities that would be required to newly report under part 98 due to the revisions to Table A–1 to subpart A. The EPA will continue to evaluate the revisions to subpart W in the August 1, 2023 proposed rule (88 FR 50282), any associated costs, and comments received to assess any further impacts in separate future rulemaking(s).

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0326-A1
Comment Excerpt Number: 7

Comment Excerpt: The Inflation Reduction Act (IRA) has fundamentally changed the role of Subpart W EF. Subpart W EF are no longer emissions estimates that can be debated regarding their accuracy; they will be "taxable events" subject to audits, enforcement actions and fines under the Clean Air Act (CAA). Given the history of issues over the accuracy of Subpart W EF, the IRA makes a profound change. Under the IRA, emissions reported under the Greenhouse Gas Reporting Program (GHGRP) shift from being estimates that are questionably accurate and for which there are legitimate differences over the details of their calculation. Instead, these reported amounts become "taxable events." That is, each emission bears a specific cost for the operator. Those values then become subject to audit by EPA, and differences between EPA's calculations and operators' calculations become subject to enforcement action under the CAA by the Office of Enforcement and Compliance Assurance (OECA) and ultimately fines. This change places a much larger burden on EPA to assure that the EF are accurate. No more should EPA be using 19 intermittent pneumatic controls in the mid-1990s as the basis of EF. Similarly, the process must be straightforward and clearly understood. Unfortunately, this change will also serve to suppress

individual operators from developing new and better emissions estimating techniques. Why? If an operator uses a different approach – unless it is given a specific sanction by EPA, including OECA – that choice becomes an obvious target for review by OECA. Past history with Subpart OOOO shows that OECA can develop its own approach to compliance even if the operator is using the recommendations of EPA's technical staff. OECA then threatens or imposes massive fines until the operator adheres to the OECA approach. Given the magnitude of emissions calculations under Subpart W and the structure that it is solely a non-delegated federal requirement, OECA will have vast powers to challenge any reported emissions value, with the burden of validation falling on the operator. The IRA mandates that EPA revise the Subpart W EF to improve their accuracy by the time that the tax is imposed – 2024 emissions. EPA has now released a proposal to revise Subpart W, but it not only falls short of true revisions, EPA proposes that its changes will not be effective until the calculations of the 2025 emissions – a full year after the tax will be imposed under the current flawed emissions calculation process. This mandate under the IRA raises serious issues regarding EPA's continuing pursuit of the essentially interpretive EF process where EPA is relying on studies that EPA frequently criticizes as falling short of the quality of information that it wants for EF. EPA needs to develop and execute analyses of emissions that produce a robust data assessment, but it has not. Both the 2022 proposed revision of the GHGRP EF process and the newly proposed revisions to Subpart W demonstrate that EPA does not have the resources to carry out its primary tasks regarding the GHGRP, the GHGI and the IRA. There is no way that it can viably justify expanding its scope of activities to unmandated initiatives like the creation of a new Subpart B. EPA must drop its pursuit of such ancillary and discretionary explorations of data collection unrelated to its fundamental and mandatory requirements under the GHGRP, the GHGI and the IRA. Instead, it needs to direct its resources to the compelling demands of its current tasks.

Response: See response to EPA-HQ-OAR-2019-0424-0236-A1, Excerpt 21 for the EPA's response to this comment. The EPA is not taking finalizing action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this action. Additionally, the EPA is not taking final action on proposed amendments to add subpart B (Energy Consumption) at this time. See section III.B of the preamble for the final rule for additional information. The EPA will continue to evaluate the proposed revisions to subpart W in the August 1, 2023 proposed rule (88 FR 50282), any associated costs, and comments received in separate future rulemaking(s).

32.0 General comments related to the EPA's Proposed Confidentiality Determinations and Reporting Determinations

32.1 Comments on EPA's Proposed Confidentiality Determinations and Reporting Determinations for Inputs to Equations

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 18

Comment Excerpt: EPA should update the draft versions of the CBI Tables - We ask that EPA publish updated draft versions of the CBI tables[20,21] to assist reporters concerning confidentiality determinations made under the proposed requirements.

Footnotes

[20] https://www.epa.gov/sites/default/files/2020-04/documents/direct emitters cbi table.pdf

[21] https://www.epa.gov/sites/default/files/2020-09/documents/ghgrp cbi tables for suppliers 8-28- 20 clean v3 508c.pdf

Response: The CBI tables published to the EPA's Greenhouse Gas Reporting Program website are intended as guidance documents and are not included in 40 CFR part 98. Therefore, this comment is outside the scope of the current rulemaking. However, EPA will consider this comment in future guidance publication.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council (ACC) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0325-A1
Comment Excerpt Number: 8

Comment Excerpt: EPA is proposing that certain data elements be treated as confidential and that this broadly applicable determination shall be made as part of the final rule.[20] This is in contrast with other CAA rules where a case-by-case approach to confidentiality is required. The Agency believes providing a single, advance opportunity for public comment on the Agency's determination of confidentiality is equivalent:

This opportunity to submit comments is intended to provide reporters with the opportunity that is afforded to reporters when the EPA considers claims for confidential treatment of information in case-by-case confidentiality determinations under 40 CFR part 2.
"Please note that this will be reporters only opportunity to substantiate a confidentiality claim for data elements included in this proposed rule where a confidentiality determination or reporting determination is proposed. Upon finalizing the confidentiality determinations and reporting determinations….the EPA will release or hold these data . . ." [21]

In other words, for this proposed rule, EPA will categorically determine for each data element whether confidentiality is warranted. We are concerned that EPA will conclude some reporting provision is never CBI even if it may be for a limited set of reporters. Sensitive business info can be very case-specific and not lend itself to generalizations. The degree to which a reporter must foresee future confidentiality claims based on this proposed rule is extraordinary and unreasonable, as is EPA's confidence that it understands and can balance the competitive impacts of public disclosure against the agencies preference against having to consider such impacts on a case-by-case basis as applied in other programs.

That confidence is misplaced. Energy markets, supply options, consumption choices, and energy-related business strategies are evolving rapidly, not least because of EPA's active engagement in this area through other proceedings. EPA cannot predict where the market is going and how it will reflect business and procurement strategy, business confidentiality, and areas of competitive sensitivity. EPA should provide reporters with the opportunity to seek confidentiality on a case-by-case basis or its foray into energy markets and corporate procurement strategy will cause even greater disruption than the proposal already will.

Footnotes

[20] GHGRP Proposal at 32909.

[21] Id.

Response: The EPA explained its proposed approach to evaluating the confidentiality status of data elements in the 2022 Data Quality Improvements Proposal (87 FR 37026, June 21, 2022). Specifically, we explained that in response to *Food Marketing Institute v. Argus Leader Media*, 139 S. Ct. 2356 (2019) (hereafter referred to as *Argus Leader*), the EPA no longer assesses data elements using the rationale of whether disclosure will cause a likelihood of substantial competitive harm when making confidentiality determinations. Instead, the EPA assesses whether the information is customarily and actually treated as private by the reporter and whether the EPA has given an assurance at the time the information was submitted that the information will be kept confidential or not confidential.

We disagree with commenters that EPA should provide reporters a case-by-case determination option for each individual data element. First, making CBI determinations through the rulemaking process is not a new occurrence for EPA's collection of this type of data – EPA has conducted CBI determinations in this manner for the GHGRP since 2011 as provided under 40 CFR 2.301(d). Through this process the Agency has found that proposing confidentiality determinations prior to data reporting through the proposal and rulemaking process, we have provided potential reporters an opportunity to submit comments, particularly comments identifying data elements proposed by the Agency to be "not CBI" that reporters consider to be customarily and actually treated as private. Likewise, we provided potential reporters an opportunity to submit comments on whether there are disclosure concerns for "inputs to emission equations" that we propose would be included in the annual reports and subsequently released by the EPA. This opportunity to submit comments is intended to provide reporters with the opportunity that is afforded to reporters when the EPA considers claims for confidential treatment of information in case-by-case confidentiality determinations under 40 CFR part 2. We have received no information indicating, nor do we have reason to believe, that reporting facilities would have any new or different information to substantiate their CBI claims at the time they submit data beyond that information available to them during the public comment periods on this proposal. We therefore do not believe that a case-by-case determination at the time of data submittal would result in a different confidentiality determination.

Further, where we have received comments on facility-specific issues, we have addressed those comments in the relevant sections of the preamble to the final rule. Specifically, for the handful of data elements where commenters were able to demonstrate that conditions varied significantly among reporters, the EPA decided not to make a final confidentiality determination for each of these data elements in this final action. The confidentiality status of these specific data elements

will be evaluated on a case-by-case basis, in accordance with the existing CBI regulations in 40 CFR part 2, subpart B upon receipt of a public request for these data elements.

32.2 Comments on EPA's proposed approach to assess confidentiality in response to Food Marketing Institute v. Argus Leader Media.

Commenter Name: Anonymous
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0169
Comment Excerpt Number: 3

Comment Excerpt: I agree with EPA's choice to not apply Argus Leader decision regarding confidentiality definition to its approach to designating data elements and collecting data. Section 114(c) of the CAA precludes "emission data" from being considered confidential and requires that such data be available to the public. As a representative of the public, I am in full support of EPA's stance on the issue.

Response: EPA acknowledges the commenter's support of the application of *Argus Leader* and is finalizing our approach as proposed. See section VI.A of the 2022 Data Quality Improvements Proposal for additional information.

Commenter Name: George D. Baker
Commenter Affiliation: Energy Advance Center (EAC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0205-A1
Comment Excerpt Number: 5

Comment Excerpt: In Food Mktg. Inst. v. Argus Leader Media, 139 S. Ct. 2356 (2019), the Supreme Court held that: "At least where commercial or financial information is both customarily and actually treated as private by its owner and provided to the government under an assurance of privacy, the information is 'confidential' within the meaning of Exemption 4." 139 S Ct. at 2366 (2019). The relevance of that holding here is that EPA proposes to change the status of twelve data elements currently reported under Subpart UU which have up to this point in time been treated as "confidential business information" (CBI). See, pages 81 through 86 of Table 5 of its proposal for specific changes impacting Subpart UU at https://www.regulations.gov/document/EPA-HQ-OAR-2019-0424-0147. While EPA to date has provided unambiguous assurances that the particular Subpart UU information at issue will be treated as private CBI, the proposal under consideration now specifically aims to unambiguously remove that very assurance of CBI treatment. Presumably, all Subpart UU information reported to EPA under the historic and still existing/operative warrant of CBI status will remain confidential going forward into the future, but should the current proposal to alter the current CBI status to non-CBI status of any such Subpart UU information be promulgated as a final rule

Subpart UU reporters will be compelled to report such information in the future without the current warrant from EPA that it would be reserved from public disclosure.

The EPA's rationale for that change is that the Agency asserts that the twelve Subpart UU data elements are "often" publicly available through one or more of the sources noted in the proposal. EAC recognizes and appreciates that EPA's assertion of public availability of the relevant reported information is only made in the context of a proposal, that EPA is soliciting public comment on that proposal's assertion of public availability, and that the EPA has not come to a final conclusion on that very assertion. With that understanding in mind, it is an open question in this rulemaking as to whether reporting entities in fact do "customarily and actually" treat that information as private—meaning whether they "customarily and actually" do not make such information publicly available as the Court in Argus Leader held in that case.

It is important from the outset of this discussion to emphasize that EAC members do not challenge here EPA's authority to switch from the long-utilized "competitive harm" standard to the Argus Leader standard. Nor do EAC's members claim the twelve specific Subpart UU data elements represent confidential information per se to them. We acknowledge the prospect that other Subpart UU reporters may feel otherwise with regard to these twelve data elements. That said, EAC nonetheless has a very legitimate interest in how EPA is now proposing to administer the Argus Leader-inspired change in its CBI policy within Subpart UU (and indeed throughout the GHG reporting regime) since, as well-evidenced by EPA's instant extensive proposed rulemaking, the agency has the authority to add reporting elements and obligations to Subpart UU in the future. Such possibility of EPA's future exercise of that authority creates the prospect that any such future elements added to the Subpart UU reporting regime could themselves raise CBI issues. As a result, EAC believes it is imperative that EPA "get it right" in transitioning its CBI-related policy to the Argus Leader standard.

Response: EPA stated in the preamble to the 2009 final rule (74 FR 56287, October 30, 2009), that through a notice and comment process, it would establish those data elements that are entitled to confidential treatment. The EPA's proposed approach continues to consider all comments received on proposal and evaluate claims of confidentiality before finalizing the proposed confidentiality determinations. As noted in the 2022 Data Quality Improvements Proposal, following the *Argus Leader* decision, the EPA no longer assesses data elements using the rationale of whether disclosure will cause a likelihood of substantial competitive harm when making confidentiality determinations, but rather, on "whether the information is customarily and actually treated as private." However, the change in the standard stemming from the *Argus Leader* decision did not change the fact that information that is publicly available cannot be entitled to confidential treatment – this was equally true under the previous standard. The EPA identified several public sources of information for the referenced data elements, including company websites and annual reports, company filings with the Securities and Exchange Commission, presentations at public events, third-party analyses, data reported to state oil and gas commissions and widely available to the public through commission websites and records, and general rules-of-thumb for the quantity of CO_2 required to produce a barrel of oil that are often used publicly in the oil and gas industry. Given the prevalence and variety of sources for this public data, the EPA ascertained that such information is now likely commonly understood to not be withheld as private within the reporting industry. As such, EPA proposed to designate these data elements as not entitled to confidential treatment.

Further, the EPA noted in the 2022 Data Quality Improvements Proposal that EPA also assesses "whether the EPA has given an assurance at the time the information was submitted that the information will be kept confidential or not confidential." The EPA subsequently provided, via this public comment period, an opportunity for reporters to submit public comments to make claims of confidentiality for the proposed changes to the handling of reported data. The EPA thus provided notice that, upon submittal to EPA, the information would no longer be kept confidential. The EPA further requested comment on "how the data element is commercial or financial information that is both customarily and actually treated as private," "the measures… taken to keep the data confidential and how that information has been customarily treated by your company and/or business sector in the past," and "how this data …may be different from or similar to data that are already publicly available, including data already collected and published annually by the GHGRP" (87 FR 37030). The EPA noted that "the comment period provides an opportunity to respond to the EPA's proposed determinations with more information for the Agency to consider prior to finalization." The EPA further emphasized in the 2022 Data Quality Improvements Proposal that "[d]ata that are already available through other sources would likely be found not to qualify for confidential treatment."

The EPA notes that the commenter has not claimed or provided information to demonstrate that the twelve specific subpart UU data elements represent confidential information or are customarily and actually treated as private by reporters within the reporting industry. Further, no reporters or potentially affected entities have come forward to make a claim that this information is customarily and actually treated as private by the reporter; provided information explaining why or how the data elements are kept as confidential or how the information has been customarily treated by the industry; or demonstrated that these types of data are not in fact publicly available for the industry reporting under subpart UU.

If any commenter had provided comment demonstrating that any of the subpart UU data elements are in fact customarily and actually treated as private by reporters and are not publicly available for the reporting industry, EPA would have a basis for evaluating these claims. EPA disagrees that an individual reporter's decision not to make information publicly available on their website is proof that the data is "customarily and actually" treated as confidential by the reporter (since there could be other reasons that certain data are not posted on a website) or the industry as a whole (since other reporters are making the data publicly available).

Therefore, EPA is finalizing the revisions to the confidentiality determinations for the 12 subpart UU data elements as proposed.

Regarding future revisions to 40 CFR part 98, the EPA reiterates that it will continue to assess the individual data elements that are entitled to confidential treatment through a notice and comment process in which commenters would have the opportunity to identify data elements that reporters consider to be customarily and actually treated as private.

Commenter Name: George D. Baker
Commenter Affiliation: Energy Advance Center (EAC)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0205-A1
Comment Excerpt Number: 6

Comment Excerpt: With minor variation in verbiage used in addressing each of the twelve Subpart UU items, the rationale EPA provides in its proposal for each informational element in this revisitation of the CBI treatment for Subpart UU is illustrated in the general statement provided for "total mass data for CO_2 received by pipeline" submitted pursuant to 40 CFR 98.476(a)(1), which explains as follows:

This data element requires reporting of the total annual mass of CO: received by pipeline. In 2012, EPA proposed that this data element would be categorized as Not CBI (77 FR 1434). Following review of public comment, however, the EPA determined in its final rulemaking (77 FR 48072, August 13, 2012) that the quantities of CO_2 received could result in substantial competitive harm if released for some facilities that report under subpart UU and the Agency had no reason to believe that the information was otherwise publicly available. Therefore, EPA determined that this information was entitled to confidential treatment. Since that time, EPA has become aware that the company and facility-level data for CO_2 received reported under Subpart UU are often available to the public through company websites and annual reports, company filings with the Securities and Exchange Commission, presentations at public events, and third-party analyses. In addition, oil and gas production to the well level is reported to state oil and gas commissions and is widely available to the public through the commission websites and records as well as through third parties. General rules-of-thumb for the quantity of CO_2 required to produce a barrel of oil are often used publicly in the oil and gas industry to estimate CO_2 quantities received and injected. For this reason, the EPA has determined that these data elements are not customarily and actually treated as confidential; therefore, the EPA proposes to designate the proposed new data elements as not entitled to confidential treatment.(Italics added.) See page 81 of Table 5, https://www.regulations.gov/document/EPA-HQ-OAR-2019- 0424-0147.

Review of the above-quoted rationale proffered by EPA reveals several essential elements:

- The historic CBI treatment of the twelve data elements (hereinafter "the relevant reported information") for which EPA proposes to make this change in CBI status was premised on the EPA's specifically considered conclusion that public disclosure of that information could lead to competitive harm to "some" reporting entities. The use of the word "some" clearly indicates that EPA understood that the competitive harm risk was not necessarily universal to all reporters, but it was necessary and appropriate to provide CBI protection for those that did treat the information as private and not public;
- The reason public disclosure of the relevant reported information could cause competitive harm to the reporting entities was that the information was treated by them as confidential and proprietary—even if not all reporting entities treated their information similarly-- and such information was NOT already accessible to the public.
- As indicated by the supplied italics in the above-quoted illustrative rationale language, the EPA asserts that it has recently come to the agency's attention that this

information is "often" available to the public through any of the several sources listed, and as a result, EPA concludes that such information is not "customarily and actually" treated as confidential by the reporting entities. Consequently, EPA proposes to no longer deem that relevant reported information as being entitled to confidential/CBI treatment.

EAC suggests that the EPA's assertion that the relevant reported information under Subpart UU now meets the Argus Leader standard for being "publicly available" may be insufficiently supported by facts and is open to question for several reasons which are highly relevant to EPA's adoption and application of the Argus Leader standard here. In particular, EAC offers the following observations:

- EPA's assertion that the relevant information is "often" available to the public is very general, to the point of depriving that conclusion of a singular and precise meaning. Does "often" mean "sometimes," "frequently," "regularly," "periodically," or something else? Does EPA mean that in the case of every reporting entity such relevant information is "often" publicly available, or does it mean that in some general survey of the class of reporting entities EPA might "often" find a majority or even a substantial minority of the universe of reporters' information that is publicly available? Or, does "often" mean that there are individual instances where one might find the information publicly available, but those instances only represent a distinct minority of the broader universe of reporters? To the extent that such survey might find individual instances where the relevant reported information is found on one of the listed sources suggested by EPA, it is not clear how representative that discovery may be compared to the mass of such relevant reported information submitted to EPA by the broader universe of reporting entities. Compare all this uncertainty with the EPA's acknowledgment in its rationale that the current CBI status was based on the considered conclusion that "some" reporters maintained their relevant reported information as confidential. This conceptual imprecision is not a matter of semantics but goes to the heart of the substantive issue of the information's public availability under the Argus Leader standard because in EAC's experience reporting entities in large measure do not generally make public the relevant reported information at issue here—perhaps "some" do and but others do not-- and to posit that such information is "often" publicly available through any of the several sources listed is at odds with EAC members' experience and understanding of the attendant facts in the EOR sector of the industry.
- While EAC acknowledges the possibility that it may or may not be a universally or widely held view held by Subpart UU reporters in general that the relevant reported information is considered confidential, some may do so for a host of legitimate reasons. But whether an individual reporter views that information as confidential or not appears to be irrelevant to EPA's interpretation of the Argus Leader standard that the Agency proposes to adopt here. The operative question EPA poses from Argus Leader is whether the relevant information, which EPA is compelling a reporter to share with the Agency, is customarily and actually publicly available, and EPA seems to suggest the analysis is not at the individual reporter level but on a broader industry-wide framework. EAC suggests that it is open to question as to whether the relevant

reported information in Subpart UU meets that Argus Leader assessment standard. The Argus Leader standard does not contemplate deeming occasional or individual instances of public access to such information—perhaps information reported by a single reporter or a few reporters, or reported by third parties on the operations of an individual reporter or several reporters—to be representative of the confidentiality views and practices of the broader universe of reporters of such information. Methodologically speaking, information provided by a particular Subpart UU reporter or even several reporters-- which instances may only be deviations from the general industry-wide practice followed by the broader universe of respective reporters—is not fairly considered representative evidence that such information is "often" publicly available when viewed on a broader industry basis. In EAC's view, the Argus Leader standard requires that EPA demonstrate evidence that the relevant information is predictably and commonly understood to be public information within the broader universe of reporters and that the source of the public's access can be specifically identified. It is noteworthy in this regard that in the preamble of EPA's proposed rule the Agency understandably asks the public to provide the Agency with specific examples and citations of sources where the relevant reported information might be publicly available. See, 87 Fed Reg at 37030. EAC applauds EPA for proceeding in such a careful and appropriate manner in making this request for public input on just how and where the relevant reported information is actually publicly available. But the fact that EPA is asking the public for evidence of the public availability of the relevant reported information at a minimum suggests the possibility that EPA is not itself yet convinced of the factual basis for the assertion. EAC agrees with EPA's effort to adduce public comments that would supplement the agency's own research that there is a sufficient reservoir of supportive information in the record of the proceeding to justify the proposed assertion regarding the public availability of the relevant reported information before that assertion becomes a conclusion deemed legally sufficient to support the proposed changes in CBI status under the Argus Leader standard.

In conclusion, EPA should not change the status of the relevant reported information from CBI to non-CBI based on generalized, factually unsupported assertions that the information is publicly available. EPA particularly should not do so under circumstances where unsubstantiated claims of public availability of the information could expose reporting entities to what EPA has long-acknowledged to be the risk of competitive harm. For any Subpart UU reporters who, in reliance on EPA's long-held view that the relevant reported information is in fact CBI, have continued to protect their relevant reported information as confidential business information since inception of the EPA's GHG reporting program, nothing has changed and EPA's proposed assertion that such information is publicly available would appear to be simply not correct with regard to them as a matter of fact. For those reporters, EPA's previously recognized conclusion that disclosure of the relevant reported information could expose the reporting entity to risk of competitive harm remains the operative reality.

Response: The EPA is finalizing our confidentiality approach and the confidentiality determinations for the 12 subpart UU data elements as proposed. See response to comment EPA-HQ-OAR-2019-0424-0205-A1, Excerpt 5.

Commenter Name: George D. Baker
Commenter Affiliation: Energy Advance Center (EAC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0205-A1
Comment Excerpt Number: 7

Comment Excerpt: EAC suggests that EPA could modify its current proposal in either of two ways, by either providing for a general presumption that the relevant information is not CBI unless a reporting entity affirmatively claims CBI status for its own information, or alternatively, EPA could provide a general rebuttable presumption that relevant information claimed to be CBI by the reporting entity continues to be deemed CBI unless and until affirmatively demonstrated to be publicly available from other sources. In the case of the first option, *i.e.*, a general rule eliminating CBI status unless the reporting entity asserts a good faith claim of CBI protection for its own information and represents that its information is not publicly available, EPA could investigate on its own initiative whether the reporter's claims are valid, or the agency could rely upon information received from the public demonstrating that the reporter's relevant information is in fact available to the public from other sources. EAC recognizes that the preamble to the current proposed rulemaking suggests that EPA aspires to avoid the administrative burden of investigating a reporter's claim of confidentiality. But, as evidenced by EAC's emphasized caveat at the commencement of this Section IV where EAC clearly noted that its members do NOT claim the relevant reported information in question is confidential to them per se, EPA should be able to assess through the comments to this Subpart UU proposal whether the number of potential claimants of CBI status is expected to be large or small. If the number proves to be small (recall EPA's willingness to avoid harm to "some" reporters in justifying its currently existing CBI policy), then the option laid out here of allowing individual reporters to make a claim of CBI protection should not constitute much of an administrative burden at all. In effect, this alternative makes the reporter's good faith claim of confidentiality a rebuttable presumption that either is or is not supported by the facts of the information's public availability.

In the case of the second alternative establishing a general rebuttable presumption in which the relevant reported information would continue to be deemed CBI unless and until demonstrated to be available from other sources, the requirement of an affirmative finding of public sourcing of the relevant information would obviate the imposition of an illogical and likely impossible burden on the reporting entity claiming CBI status to "prove the negative," specifically that the information is not publicly available. Such a rebuttable presumption process would fairly comport with appropriate due process considerations and parallel the process deployed under the Freedom of Information Act. EAC would suggest that either of the above options are legally supportable, operationally administrable, and fair to EPA, the reporting entities, and to the public, and would represent sound public policy going forward into the future.

Response: The EPA is finalizing our confidentiality approach as proposed. See response to comment EPA-HQ-OAR-2019-0424-0205-A1, Excerpt 5.

33.0 Comments related to the impacts of the proposed amendments

Commenter Name: Anonymous
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0167
Comment Excerpt Number: 2

Comment Excerpt: Although the proposed amendment comes at an additional cost burden to EPA, and will require resource commitment from industry, American public will benefit in the long run with better information, which will ultimately lead public representatives to make improved and informed decision and provide a more clean environment to future generations.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

Commenter Name: Anonymous
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0169
Comment Excerpt Number: 2

Comment Excerpt: I understand that these proposed changes will create additional complexities and financial burden for the affected industries ($1,417,494 additional cost on average per EPA's estimates). However, since the reporting requirements only apply to facilities with emissions greater than 25,000 $mtCO_2e$ per year, the companies to which reporting requirements apply to, should be able to absorb the cost.

Response: The EPA acknowledges the commenter's support for the proposed revisions.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA should update its estimate of the burden and associated costs of the proposed rule's recordkeeping and reporting requirements to more accurately reflect the full burden imposed on the public. EPA's estimate of burden should be consistent with the requirements of the PRA implementing regulations that require the agency to consider the "time, effort, and financial resources necessary to comply with the information collection," including

estimating the "time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information." EPA should also include the estimated cost range for affected facilities in addition to providing the average, as the average cost conceals the higher and lower end of the cost impacts. To better assess the costs, EPA should separate out the costs of compliance for the newly affected entities from those that are already participating in the program.

EPA estimates that 10,041 facilities would be affected by the proposed rule revisions and that the added cost would be over $1.4 million per year. The capital/startup and operation and maintenance costs were only estimated to be $7,281 per year for all 10,041 facilities. The average estimate provides limited information regarding the impacts of the program, particularly on newly affected entities. EPA should also include the estimated cost range for affected facilities in addition to providing the average, as the average cost conceals the higher and lower end of the cost impacts. To better assess the costs, EPA should separate out the costs of compliance for the newly affected entities from those that are already participating in the program. For those being included in the program for the first time, the time and capital investment will be much higher, as facilities will need to develop templates and protocols. The agency should reflect these differences in its cost estimates as opposed to spreading the cost across all entities through an average estimate. The agency has proposed to expand the applicability of the reporting requirements to smaller and smaller sources of emissions, by expanding to new industrial sectors, which will lead to proportionally higher costs of implementing the program for those sources.

Smaller emissions sources are likely smaller sized businesses who if required to comply with the rule would be disproportionately impacted compared to larger businesses. EPA's estimate in the Regulatory Flexibility Act section of the preamble states that the "reporting and recordkeeping in this action for each subpart are less than $100 per entity, with an average annual burden increase of $46 per entity," which appears to be an underestimate of the public burden to implement the recordkeeping and reporting requirements. This estimate appears to ignore many of the components of burden[11], some of which are listed below and are cited in the PRA implementing regulations[12] that the agency is required to analyze.

- Reviewing instructions;
- Compiling materials necessary for collection;
- Acquiring, installing, and utilizing technology and systems;
- Adjusting existing ways to comply with previous instructions and requirements;
- Searching data sources;
- Completing and reviewing collected information; and
- Compiling and sending information.

Other elements such as reading the Federal Register final rulemaking notice and training employees regarding the new recordkeeping and reporting requirements should also be considered as part of the estimated burden. The agency should also consider the time and cost burdens of performing detailed calculations, which are substantial for some industrial sectors.

Additionally, the agency's Information Collection Request Supporting Statement appears to underestimate the burden of reporting as it describes the reporting as annual reporting while

many of the recordkeeping and reporting requirements require affected entities to perform recordkeeping or reporting action on a monthly, quarterly, or semi-annual frequency. [Proposed rule regulatory text at Subpart A of § 98.33, § 98.36, § 98.37, § 98.77, § 98.83, § 98.147, § 98.163, § 98.164, § 98.167, § 98.193, § 98.197, § 98.426, § 98.427.]

EPA estimated the average hourly burden of the proposed revisions as totaling less than two hours per entity affected. Monetizing the time burden for compliance with the recordkeeping and reporting requirements for the various layers of a company from the clerical workers, skilled and craft labor, professionals, and executives would easily exceed EPA's average burden estimate.

Footnotes

[11] 5 CFR 1320.3 (b)(1) "Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency, including:"

[12] 5 CFR 1320.3 (b)(1)(i)-(ix).

Response: The EPA's impacts analyses for the proposed rules are consistent with the requirements of the PRA and account for the incremental burden associated with the requirements of the proposed rules. The EPA included a full accounting of the incremental burden in the impacts analysis to the 2022 Data Quality Improvements Proposal, *Assessment of Burden Impacts for Proposed Revisions for the Greenhouse Gas Reporting Rule* (April 2022), and in the impacts analysis to the 2023 Supplemental Proposal, *Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule* (May 2023). The total burden estimated is based on the time for facilities to monitor, calculate, or extract data elements as well as the time to maintain, retain, or disclose data in the annual reports submitted to e-GGRT. For the majority of these data elements, EPA determined that reporters already track the information through existing management of operations or to comply with the existing rule. The impacts analyses do not account for activities that are currently performed by reporters to meet the existing requirements of part 98 (*e.g.*, annual planning or review activities), but rather the additional time needed to comply with new requirements in the proposed rules.

In response to the comment that EPA should separate out the costs of compliance for newly affected entities from those that are already participating in the program, EPA provided that information in the supporting documentation for the proposed rules. Although the EPA provided a summary of the estimated annual average burden increase in the preambles to the 2022 Data Quality Improvements Proposal proposed rule and 2023 Supplemental Proposal, it referenced the EPA's impacts analyses, which included more detailed estimates of the cost ranges for affected facilities for each subpart, including estimates for new reporters. For example, initial and subsequent year costs to facilities that would be newly required to report by proposed revisions that changed applicability (*e.g.*, costs to new reporters under subparts I and VV) were included in section 3.2 of the memorandum *Assessment of Burden Impacts for Proposed Revisions for the Greenhouse Gas Reporting Rule* (April 2022)). Similarly, the EPA's impacts analysis for the supplemental proposed rule included the initial and subsequent year burden for revisions that affect the number of facilities that are required to report (including new or off-ramping reporters) in sections 2.2 through 2.3 of the May 2023 memorandum. Additional time is included for new reporters for planning, sampling or monitoring and conduct of calculations, QA/QC activities, and reporting and recordkeeping. In the initial year of implementation, EPA estimated that new

facilities would require more time to read the rule, become familiar with the requirements for their subpart, and plan and set up any facility-specific procedures required for reporting. The associated burden for the proposed revisions to each subpart is also included in Appendix A of the impacts analyses.

Regarding the commenter's reference to EPA's summary of costs associated with revisions to recordkeeping and reporting in the preamble to the 2022 Data Quality Improvements Proposal as part of the regulatory flexibility analysis, the EPA discussed separately the impacts for industry sectors where changes included revisions to applicability that would impact facilities that have never reported to the GHGRP (subpart I), impacts based on changes to existing monitoring or calculation methodologies (subparts C, G, I, P, W, and S), and for all remaining subparts, the impacts of revisions to the reporting and recordkeeping requirements for data provided to the program. The preamble summarized the annual average reporting burden for these revisions and referred to the detailed analysis in the memorandum *Assessment of Burden Impacts for Proposed Revisions for the Greenhouse Gas Reporting Rule* (April 2022) for additional information. Table 3-2 of the April 2022 memorandum provides the range of costs for additional reporting and recordkeeping for affected facilities, which the EPA estimated ranged between $4 and $412 per affected entity. As explained in the April 2022 impacts memorandum, the EPA opted to propose new or revised data elements that we expected may generally be obtained from existing company records or are readily available from existing information that is already gathered under part 98. For example, EPA proposed data elements that should already be available in company records as part of routine facility tracking of materials for input/production, or are that are gathered during measurements taken during the year for existing part 98 requirements. The proposed revisions to add reporting requirements also do not change the required frequency of existing monitoring or sampling that is performed. Therefore, for the majority of proposed data elements, no additional calculations, monitoring, or sampling would be required for existing reporters. As such, the incremental burden for these new or revised data elements includes the time required to gather and enter the information into e-GGRT. Because e-GGRT is designed to facilitate reporting of the required data elements, and since we anticipate that existing reporters know how to use the e-GGRT data entry systems and already have the information available, the EPA determined that the rule would not require additional training on the proposed data elements for existing reporters or add additional burden beyond what is currently estimated for reporters under the existing rule. For any data elements that were not readily available to reporters and for which additional calculations, monitoring or sampling is required, the EPA estimated the burden separately (see "Revisions to Monitoring and Calculation Methodologies" in section 3.3, of the memorandum *Assessment of Burden Impacts for Proposed Revisions for the Greenhouse Gas Reporting Rule* (April 2022) and section 2.4 of the memorandum *Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule* (May 2023). Additional details of the associated burden for the proposed revisions for reporters in each subpart are included in Appendices A and B of the impacts analyses.

Regarding the commenter's concern that the annual average burden per respondent in the supporting statement is too low, Exhibit 6.2 of the supporting statement to the June 2022 proposed rule provides the annual average incremental burden per respondent for each subpart. These values reflect the average incremental burden incurred by a reporter in each affected subpart in the three years following implementation and range from 0 (*e.g.*, subpart FF reporters for which we are only proposing technical corrections) to 21 hours per reporter (existing

reporters who we anticipate would begin reporting under subpart VV). Exhibit 6.2 of the supporting statement to the 2023 Supplemental Proposal provides a similar detailed breakdown of the average incremental burden per reporter in each affect subpart and ranges from a burden reduction of 74 hours (a subpart V reporter who would no longer be required to report) to a burden increase of 126 hours (new subpart W reporters).

EPA has reviewed the burden and cost estimates from the 2022 Data Quality Improvements Proposal and the supplemental proposed rule and has subsequently revised these estimates to better reflect the number of reporters potentially affected by the final revisions, based on review of RY2022 data, and to reflect the changes of the final rule. The final costs are included in the memorandum *Assessment of Burden Impacts for Final Revisions for the Greenhouse Gas Reporting Rule*, available in docket EPA-HQ-OAR-2019-0424. Note that EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this action; subsequently, the costs associated with proposed revisions to subpart W are not included in this final rule, with one exception. See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3 in section 32.5 of this document for additional information.

33.1 Comments on impacts of the proposed amendments to non-W subparts and new subparts.

Commenter Name: John Fusch
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0166-A1
Comment Excerpt Number: 1

Comment Excerpt: Streamlining reporting information is important for any organization. Having a standardized flow of data can make room for many additional improvements and ways to understand Greenhouse emissions. With a change in reporting that will bring "quality and consistency," but also come with changes to calculation, record keeping, and reporting requirements. These can come with a hefty price tag. The current price of monitoring software from a C&EN article: "The monitoring software, which can cost anywhere from $50,000 to $200,000 depending on the system to be monitored, can compile emissions reports that companies will have to file with EPA." With a price tag this large on software to monitor GHG, one begins to wonder if companies will have to upgrade their existing software or purchase a new package in order to keep up to date with the EPA's reporting requirements. On page 246 there is mention of "redefining certain industry sensors to include additional GHGs not previously reported." These sensors can run anywhere from $20 to $200 and if some industries have to replace them they would be replacing thousands of sensors. This could be seen as pretty unreasonable. The EPA might need to receive better information on GHGs, but will there have to be changes to the current people who have to report them? Has the EPA done all it could to figure out the necessary data from the information already provided, so that additional purchases to software or sensors wouldn't be required? Do the benefits outweigh the costs if this plan does come to fruition?

Response: The commenter has misinterpreted the text; 87 FR 36926 states "In some cases, we are proposing to redefine certain industry sectors to include additional GHGs not previously reported, or to add emissions estimations methodologies and include reporting of GHGs from newly identified sources of emissions in certain industry sectors, to better account for changes in industry emission trends." The proposed amendments included adjustments to the rule where we identified changes in the reporting of type and scope of GHGs emitted or supplied by specific sectors, *e.g.*, where we proposed to expand subparts DD and SS to include equipment containing fluorinated GHGs other than those currently reported (*i.e.*, sulfur-hexafluoride (SF_6) and perfluorocarbons (PFCs). The revisions to subpart DD and SS to include additional fluorinated GHGs beyond SF_6 and PFCs will not require facilities to install new sensors or monitoring equipment.

Further, EPA disagrees with the commenters estimate that monitoring equipment required under the proposals would cost $50,000 to $200,000. With respect to proposed changes to monitoring requirements, the EPA estimated the burden associated with revisions to the data collection and monitoring requirements in section 3.3 of EPA's *Assessment of Burden Impacts for Proposed Revisions for the Greenhouse Gas Reporting Rule* (April 2022) and section 2.4 of EPA's *Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule* (May 2023); the burden for these activities has been adjusted to reflect updates to the number of affected reporters from RY2022 reporting, and to account for changes to the final rule, in the memorandum, *Assessment of Burden Impacts for Final Revisions for the Greenhouse Gas Reporting Rule*, available in the docket for this rulemaking. Note that EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this action; subsequently, the costs associated with proposed revisions to subpart W, including any burden associated with proposed monitoring, are not included in this final rule. See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3 in section 32.5 of this document for additional information.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 46

Comment Excerpt: In the Cost Spreadsheet, EPA nets out removed data elements from the cost estimate. This is inappropriate. For the initial year of reporting, any change results in work, even the exclusion of data elements. This is because reporters need to update their documentation, procedures, databases, and report mapping to remove these elements. Removed elements result in work. As such, the removal of a data element doesn't somehow negate the burden of an additional data element, especially in the first year of reporting when reporters must update procedures, documentation, calculations, databases, reporting mapping, etc.

Response: The EPA's impacts analysis accounts for the incremental burden associated with the requirements of the proposed rule, including where burden may be streamlined. In this final rule,

the EPA is finalizing the removal of two data elements for subpart C, 40 CFR 98.36(c)(1)(vi) and (c)(3)(vi), which results in a modest burden reduction. Because reporters will no longer be required to gather and enter these specific data in their annual reports submitted to e-GGRT, for the purposes of estimating the burden for activities required by the proposed rule, we consider these data elements "removed" and have accordingly adjusted the costs to remove the burden for collection of this data. The impacts analysis also does not account for activities that are currently performed by reporters to meet the existing requirements of part 98. Therefore, the EPA did not include burden related to the activities described by the commenter because they would already be included in the overall reporter burden for existing planning and recordkeeping and reporting activities. The EPA has separately accounted for the burden to reporters for gathering and updating new or revised data elements internally for their annual reports. As explained in the impacts memorandum *Assessment of Burden Impacts for Proposed Revisions for the Greenhouse Gas Reporting Rule* (April 2022), the EPA proposed new or revised data elements that we expect may generally be obtained from existing company records or are readily available from existing information that is already gathered under part 98, therefore, for the majority of data elements, no additional calculations, monitoring, or sampling is required. Therefore, the incremental burden for these new or revised data elements includes the time required to gather and enter the information into e-GGRT. For any data elements for which additional calculations, monitoring or sampling is required, this burden was estimated separately.

Note that EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this action; subsequently, the costs associated with proposed revisions to subpart W, including removal of reporting requirements for any data elements, are not included in this final rule. See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3 in section 32.5 of this document for additional information.

Commenter Name: Darrell K. Smith and David Biderman
Commenter Affiliation: National Waste & Recycling Association (NWRA) and Solid Waste Association of North America (SWANA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0237-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA calculated a burden of only $3,297 for MSW landfills. We believe these costs are low for the changes proposed. Significant effort is required to reconfigure recordkeeping processes and xml coding for reporting. There may also be cases where new measurement locations must be installed to collect data for proposed new reporting elements.

Response: The commenter states that they believe the cost estimate for the proposed revisions to subpart HH in the 2022 Data Quality Improvements Proposal were low, but EPA has determined that this estimate is reasonable. The costs referenced by the commenter were associated with a proposed requirement in the 2022 Data Quality Improvements Proposal to include additional reporting for landfills with gas collection and control systems to indicate the percentage of recovered CH_4 that is sent to a flare or sent to a gas to energy project for each

measurement location. We note that EPA is not finalizing the referenced proposed requirement but is revising reporting requirements related to capture systems and destruction devices in the 2023 Supplemental Proposal which will provide similar information. For example, we are requiring time of operation of each control system, by which we can estimate the relative volume of gas flared versus sent to landfill-gas-to-energy projects. The EPA provided updated cost estimates associated with these revised reporting requirements as discussed in the following paragraph.

The EPA subsequently proposed amendments to subpart HH in the 2023 Supplemental Proposal to introduce updated calculation and monitoring methodologies as well as reporting requirements. The EPA also retained proposed requirements to report, for each measurement location, the type of device (flare, a landfill gas to energy project (*i.e.*, engine or turbine), off-site, or other (specify)), and the estimated fraction of recovered CH_4 reported for the measurement location directed to the destruction device. The EPA clarified in the supplemental proposed rule that this estimate should be based on best available data or engineering judgement, and we are not requiring that reporters install new monitoring locations. The EPA provided updated cost estimates for the proposed supplemental revisions in the memorandum *Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule* (May 2023) to account for the burden associated with the proposed revisions, including additional time for reporters to adjust to the revised calculation, monitoring, and reporting methodologies. The cost estimates from the supplemental proposed rule have subsequently been revised to better reflect the number of reporters potentially affected, based on review of RY2022 data, and to reflect the changes of the final rule; the final costs are included in the memorandum *Assessment of Burden Impacts for Final Revisions for the Greenhouse Gas Reporting Rule*, available in docket EPA-HQ-OAR-2019-0424. In this final rule, we have also adjusted or removed costs associated with the supplemental proposed revisions related to calculation and reporting of data related to surface emissions monitoring of excess emissions, which further reduces the burden of the final rule. Without more detailed information, which the commenter did not provide, there is no justification for further changing the proposed costs related to the above data collection activities, and as such, the final estimates are reasonable.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council (ACC) et al.
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0325-A1
Comment Excerpt Number: 10

Comment Excerpt: Without the comment extension requested and denied by EPA, the Commenters are unable address and detail many of the business and policy impacts of the supplemental proposal in the time allotted, but initial consultations with members and supply chain partners affirm that the nature and extent of information required to be collected, analyzed, and reported; the need to develop new energy monitoring, management, and validation systems, and the capital investments in new equipment and facility design required for the rule will have

adverse impacts on many reporters incommensurate with the stated interests in the information, including: significant resource burdens on staff, disruptions to business operations, changes to business agreements and contractual terms with suppliers, conflicts with intellectual property policies and protections; and increased risk of disclosure of competitive information, confidential business information, and inconsistency or duplication with other government and third-party reporting programs.

There is no indication that EPA considered such impacts in the development of this proposal, and further action in this proceeding should be stayed pending robust consultation with EPA's sister Agencies, state and regional energy organizations, and the regulated community.

Response: EPA disagrees with the comment that EPA did not consider the impacts of the proposed revisions. EPA discussed the anticipated impacts of the proposed revisions in section 7 of the preamble to the 2023 Supplemental Proposal and developed a detailed accounting of the anticipated impacts in the memorandum *Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule* (May 2023).

Regarding the comment that the supplemental proposed rule would have adverse impacts incommensurate with the stated interests in the information, the commenter provided few details to support this assertion or to contradict the EPA's proposed impacts analysis, which concluded that the proposed requirements would result in an overall increase in burden to reporters. In response to the comment that the commenter is unable to address and detail these specific impacts due to the EPA's denial of a comment extension request, the EPA reiterates that we considered the 60-day comment period to be appropriate and to provide a meaningful opportunity to comment on the supplemental proposed rulemaking. We note that EPA posted a copy of the pre-Federal Register publication version of the notice on the EPA website on May 5, 2023, the same day the proposal was publicly announced. Including this opportunity for pre-publication review, the total amount of time for commenting amounted to 76 days. In addition, EPA offered to meet with stakeholders upon request about the proposal for the remainder of the comment period.

Regarding the comment that the proposed rule would have adverse impacts due to "the need to develop new energy monitoring, management, and validation systems," "capital investments in new equipment and facility design," and "significant resource burdens on staff, disruptions to business operations, changes to business agreements and contractual terms with suppliers," the EPA noted in the development of the supplemental rule that the primary costs associated with the supplemental rule include initial labor and non-labor costs for reporters that are newly subject to part 98 to come into compliance with the rule. The EPA's impacts analysis for the supplemental proposed rule included the initial and subsequent year burden for revisions that affect the number of facilities that are required to report (including new or off-ramping reporters) in sections 2.2 through 2.3 of the memorandum *Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule* (May 2023). For proposed subpart B and other new subparts VV, WW, XX, YY, and ZZ, the EPA also estimated labor hours for activities required for reporting to the GHGRP including planning, QA/QC activities, sampling and analysis activities, conducting calculations, recordkeeping, and reporting; and non-labor costs including capital and O&M costs. These costs were estimated based on the costs associated with similar activities currently conducted under part 98, with additional time included for new reporters. The EPA is not taking final action at this time on the proposed addition of subpart B

(Energy Consumption); accordingly, the final rule does not reflect requirements under subpart B related to energy supply, monitoring, or management, and the impacts of the final rule do not reflect the costs for the proposed revisions. For the remaining subparts, in the initial year of implementation, EPA estimated that new facilities would require more time to read the rule, become familiar with the requirements for their subpart, and plan and set up any facility-specific procedures or systems required for reporting. For existing reporters, the total burden estimated is based on the time for facilities to monitor, calculate, or extract new data elements, the majority of which are already tracked in existing management of operations or to comply with the existing rule, as well as the time to maintain, retain, or disclose data in the annual reports submitted to e-GGRT. The impacts analyses do not account for activities that are currently performed by reporters to meet the existing requirements of part 98 (*e.g.*, annual planning or review activities), but rather the additional time needed to comply with new requirements in the proposed rules. The cost estimates in the impacts analysis were based on the best available information and are consistent with cost estimates for existing industry segments that are already subject to part 98. Unfortunately, the commenter has not provided enough information in their comment to allow the EPA to adequately compare to or update the proposed estimates. Without more detailed citations or support, there is no justification for changing the proposed costs related to the above data collection activities.

Regarding the commenter's concerns over "conflicts with intellectual property policies and protections" and "increased risk of disclosure of competitive information, confidential business information," the EPA evaluated and proposed confidentiality determinations for each new and substantially revised data element in the proposed amendments. By proposing confidentiality determinations prior to data reporting, the EPA provided potential reporters an opportunity to submit comments, particularly comments identifying data they consider sensitive and their rationales and supporting documentation. The EPA has subsequently evaluated the comments on the proposed determinations, including claims of confidentiality and information substantiating such claims, before finalizing the confidentiality determinations. Information that EPA found to be eligible for confidential treatment will be treated as such by EPA. See section VI of the preamble to the final rule for additional information.

Regarding the commenter's concerns with "inconsistency or duplication with other government and third-party reporting programs," the EPA previously evaluated the types of industry data currently collected under part 98 and concluded that they do not duplicate other information collections (see, for example, section 3 to ICR 2733.01, available at www.regulations.gov, Docket Id. No EPA-HQ-OAR-2022-0883-0018). Further, as discussed in response to comment EPA-HQ-OAR-2019-0424-0325-A1, Excerpt 9, the EPA considered each individual revision to each subpart for the reasons described in section III of the preamble to the final rule and in the preambles to the 2022 Data Quality Improvements Proposal and 2023 Supplemental Proposal; based on our review, and to the best of our knowledge, the information required by the revisions in this final rule would not duplicate or conflict with other government or voluntary reporting programs, including those referenced by the commenter. As noted above, we are not taking final action on proposed amendments to add subpart B (Energy Consumption) at this time, thereby removing any potential overlap regarding the reporting of energy data with the referenced standards.

EPA has reviewed the burden and cost estimates from the 2022 Data Quality Improvements Proposal and the supplemental proposed rule and has subsequently revised these estimates to

better reflect the number of reporters potentially affected by the final revisions, based on review of RY2022 data, and to reflect the changes of the final rule. The final costs are included in the memorandum *Assessment of Burden Impacts for Final Revisions for the Greenhouse Gas Reporting Rule*, available in docket EPA-HQ-OAR-2019-0424. Note that EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this action; subsequently, the costs associated with proposed revisions to subpart W are not included in this final rule, with one exception. See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3 in section 32.5 of this document for additional information.

33.2 Comments on impacts of the proposed amendments to subpart W (Petroleum and Natural Gas Liquids)

Commenter Name: Ryan Watts
Commenter Affiliation: Kentucky Oil and Gas Association (KOGA)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0182-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA is promulgating another requirement for the Oil and Gas industry that established new data gathering, compliance activities, and reporting requirements that will not provide a return on the required investment. The cost of these activities will be an additional burden on all the KOGA members because they are not required to report Green House Gas emissions today. Our members will need to create programs that comply with EPA's requirements, where no programs currently exist.

On Page 20, EPA states, "Most of the changes that are proposed are not anticipated to significantly increase the recordkeeping and reporting burden associated with the GHGRP. The proposed changes are anticipated to improve the quality of the data reported under the program. Some of the proposed revisions could potentially increase burden in cases where the proposed amendments add or revise reporting requirements. The estimated incremental costs include an average burden of $1,424,775 per year beginning in reporting year (RY) 2023."

Reviewing Table 7 on Page 455, we see that EPA is estimating that $1.2 million of the $1.4 million cost will be associated with changes to Subpart W: Petroleum and Natural Gas Systems. We believe that EPA's estimate of approximately $1.2 million annually is a very low estimate.

Approximately 1,000 companies are registered to produce oil and gas throughout the Commonwealth of Kentucky. We estimate that the operator's first-year compliance cost will be $8.25 million, which is significantly more than what EPA is estimating the cost to all of industry will be for the entire program ($1.2 million). The $8.25 million estimate is only the cost to develop and implement a program; and does not include the cost to manage the program or submit reports to EPA annually. Table 1 shows our estimate to develop a compliance program to meet EPA's requirements

[See DCN EPA-HQ-OAR-2019-0424-0182-A1 for Table 1: Estimated Cost to Implement a GHG Reporting Compliance Program. Total program development cost estimate is $8.25 million]

Using the cost calculation in Table 1, the average cost per operator to develop a program is approximately $8,250 ($8,250,000 development cost / 1000 Kentucky operators). IPAA estimates that there are approximately 9,000 independent producers in the United States. The implementation cost for all 9,000 operators is estimated to be $74,250,000 ($8,250 implementation cost x 9,000 operators). This is just the cost to develop and implement a Green House Gas reporting program, not the annual cost to maintain the program. $74 million is a significantly greater cost than EPA is estimating for industry to implement this program at $1.2 million.

We also looked at the cost to operate and manage the Green House Gas reporting program. EPA is estimating that the total cost for collecting data, reviewing, and reporting the data will be $1.2 million per year. We are estimating that the cost for Kentucky operators also be much higher than EPA's estimate. EPA provides the option to use field inspections or to use factor estimates to determine emissions rates. We have estimated the cost for both options. The cost for the 1,000 Kentucky operators to complete the field estimates is approximately $12 million per year (Table 2) and the cost to use the factor estimates is more than $7.5 million per year (Table 3).

[See DCN EPA-HQ-OAR-2019-0424-0182-A1 for Table 2: Emissions Cost Estimate Using Field Verification Method ($11.94 million/year)]

[See DCN EPA-HQ-OAR-2019-0424-0182-A1 for Table 3: Emissions Cost Estimate Using Factor Verification Method ($7.68 million/year)]

The additional cost to develop and submit reports to EPA for Kentucky's 1,000 operators is estimated to be approximately $16 million per year. This cost estimate includes the cost to aggregate all of the data from either the field reviews or the factor estimates, enter the data into EPA's reporting template, review the data, and then complete a management review of the data. See Table 4 for the estimated cost to complete reporting.

[See DCN EPA-HQ-OAR-2019-0424-0182-A1 for Table 4: Emissions Annual Reporting Cost ($16.3 million/year)]

Table 5 is a summary of the annual estimated cost for Kentucky operators. We estimate that the total annual cost for our members will be $24 million to $28 million, not EPA's estimated $1.2 million (for all operators across the United States). We believe that EPA underestimated the compliance cost and needs to evaluate the impact that this program will have on oil and gas companies across the United States.

[See DCN EPA-HQ-OAR-2019-0424-0182-A1 for Table 5: Annual Compliance Costs for Kentucky Operators ($24 million/year)]

Response: The EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this final action; subsequently, costs associated with proposed revisions to subpart W are not included in this final rule, with one exception. As discussed in the memorandum *Assessment of Burden Impacts for Final Revisions for the Greenhouse Gas Reporting Rule*, the EPA has included the costs (including capital and operation and maintenance costs) to subpart W reporters who would be newly required to report under each subpart due to the proposed revisions to Table A–1 of subpart A of part 98. These costs reflect the existing requirements of subpart W that would apply to new reporters; the final rule does not include

additional costs for existing subpart W reporters. See section I.C of the preamble to the final rule for a discussion of EPA's actions regarding subpart W.

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 13

Comment Excerpt: PBPA members are concerned EPA has not properly accounted for increased recordkeeping and reporting for the newly added sources, particularly as to tracking malfunctioning pneumatics and open thief hatches.

Response: See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 31

Comment Excerpt: The overall burden of $842/year per Subpart W reporter to comply with the proposed rule changes is grossly underestimated. Per Table 3-2 of the Assessment of Burden document, EPA estimates an annual average cost per reporter for reporting and recordkeeping requirements of $412 for Subpart W. EPA estimates an annual average cost per reporter for monitoring and calculation methodology of $430 for Subpart W. At a cost $91/technical labor for Subpart W, simply reading the rule once would cost $228, which is 27% of EPA's average annual cost. The rule itself contains 101 new G&B data elements. Responding to the proposed changes will require many hours of additional work for which EPA has not appropriately accounted. GPA welcomes the opportunity to further discuss development of more realistic burden estimates with the Agency.

The method of determining respondent hours is inappropriate for G&B. For G&B, EPA attests there are 101 new data elements. The calculations multiply the respondent hours by the number of reporters, but this grossly underestimates the true level of effort because there is not one data element per reporter; the data element is repeated by the number of applicable pieces of equipment within the basin, which could be hundreds. For any new data element that is reported per equipment (*i.e.*, more than once per report), EPA must assess how many affected pieces of equipment would have a new data element and use that number as the multiplier (not simply the number of reporters). EPA has all the data necessary to perform these calculations. If EPA assumes that a data element which may need to be reported for hundreds of pieces of equipment

within a basin takes a grand total of 3 minutes per year per reporter to gather, QA/QC, and report, then EPA is completely detached from the reality of reporting under this rule.

Response: See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 48

Comment Excerpt: The time estimated per data element is too low, especially for calculated data elements. Per the Cost Spreadsheet tab "W (Data Elements)," EPA estimates 0.05 hours per data element, or 3 minutes per data element. EPA claims in the Assessment of Burden document that "There are no capital or operation and maintenance costs associated with the proposed revisions to add, revise, or remove data elements, because the proposed data elements may generally be obtained from existing company records or are readily available from existing information gathered under part 98, therefore, no additional monitoring or sampling is required" and "With the exception of new data elements required of reporters using the aggregation of units or common pipe configuration under subpart C, EPA assumed 3 minutes of technical labor to calculate each data element using readily available data and to submit the value via e-GGRT or enter the value into IVT." We do not understand how EPA can, with a straight face, assume such a tiny amount of time to gather the necessary data, calculate, QA/QC and report. GPA members anticipate spending a significant amount of time (*e.g.*, months) gathering information, updating database calculations, updating reporting mapping, and updating QA/QC procedures just to initially set up the structure required to comply with these rules. This is far cry from EPA's estimate of a grand total of 6.84 hours of additional effort per year per G&B reporter and 3.68 hours per year per Processing reporter. At the very least, EPA needs to differentiate between data elements that are simple reporting elements (like count of pumps) versus data elements that have calculations behind them (like parsing out flare volumes and emissions data between different flared sources or calculating a flow-weighted basin average tank flash gas composition). While it might be appropriate to estimate some of the simple reporting elements at 3 minutes annually, any element involving a volume, emission, or composition calculation should be estimated at no less than 15 minutes.

Response: See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 49

Comment Excerpt: Comment: EPA assumes the following changes have no significant impact on burden. These changes include new emission source measurements, calculations, and reporting requirements that must be incorporated into a reporting program. This reporting rule is prescriptive, complex, and expansive; most midstream reporters have implemented one or multiple databases to make the workload manageable. Operators also have documentation, QA/QC procedures, and other tools to ensure the data is complete and potentially auditable by a third party. As such, any change in measurements, calculations or how information is to be reported (even changes that are meant to simplify or clarify) will likely result in work. Operators must update documentation, redo training, change QA/QC procedures, update data collection systems, update database calculations, and update report mapping. It is incorrect to assume changes to measurements, calculations, or reporting have no significant impact on burden.

- Adding add standby-pressurized-mode to the defined modes for centrifugal compressors.
- Measurement of rod packing leaks from reciprocating compressors when found in standby-pressurized mode.
- Revise § 98.233(r)(2) to state that the gas service emission factors and default component counts in Table W–1A and Table W–1B should be used for all subject components at Onshore Petroleum and Natural Gas Gathering and Boosting facilities.
- Revise reporting elements related to flare stacks in § 98.236(e), (g), (h), (j), (k), (I), and (m) to include the data elements formerly reported in § 98.236(n).
- Clarifying edits to § 98.236(j) related to open thief hatches for atmospheric storage tanks.
- Revise the reporting elements for atmospheric tanks from "the minimum and maximum concentrations (mole fractions) of CO_2 and CH_4 in the tank flash gas" to "the flow weighted average concentration (mole fraction) of CO_2 and CH_4 in the flash gas" in § 98.236 (j).
- Modify reporting requirements in § 98.236(n) to capture information only from "miscellaneous flared sources" (*i.e.*, emission sources which are not listed separately in the reporting form or in the XML schema).

Response: See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 47

Comment Excerpt: EPA is proposing revisions to 40 C.F.R. § 98.36(c)(1) and (c)(3) to clarify that reporters may not report a combination of one design class of compressor driver engines (using one Table W–9 CH, emission factor) and other combustion units (*e.g.*, using a Table C–2 CH, emission factor or another Table W–9 CH, emission factor) in the same aggregation of units or common pipe configuration. EPA claims the proposed change does not impose any new monitoring or reporting requirements and therefore has no impact on burden. This is false. At gas plants, it is not common (and is possibly never the case) to have an individual fuel meter on each piece of fuel combustion equipment. Reporters use the Subpart C aggregation/common pipe methods because that aligns with how fuel meters are set up — one meter for multiple pieces of equipment. Disallowing aggregation/common pipe between compressor driver engines and other combustion units will result in much more work, since instead of simply collecting volume and composition for a meter, reporters will have to apportion fuel use for all equipment on the meter. Reporters will have to collect fuel volume, fuel composition, heat rate for each equipment, run hours for each equipment (which is often not automated), and calculate the portion of fuel use per equipment using heat rate and run hours, and multiply that portion by the total fuel volume. While we understand that methane emission factors can't be mixed between design classes of compressor driver engines and other combustion units, EPA must at the very least properly account for the increase in burden. We estimate at least 2 hours per year per each aggregation of units/common pipe reported under Subpart C.

Response: The EPA is not taking final action on the proposed revisions to 40 CFR 98.36(c)(1) and (c)(3) of subpart C from the 2022 Data Quality Improvements Proposal in this action. See section I.C and III.C of the preamble to the final rule for a discussion of EPA's actions regarding overlapping requirements between subparts C and W.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 20

Comment Excerpt: Many of AGA's members operate intrastate natural gas transmission pipelines, transmission compression, underground storage and/or LNG storage facilities as part of the gas utility system regulated by their state's utility commission. These intrastate facilities are subject to the same Subpart W reporting regulations as the interstate counterparts operated by INGAA's members. While APGA members generally do not operate such facilities in their smaller systems, they are concerned about the potential unnecessary cost burdens on their upstream interstate pipeline suppliers that could be imposed by the proposed changes to Subpart W. Accordingly, the Associations support INGAA's comments on EPA's Subpart W proposed revisions for natural gas transmission, storage, and LNG operations as applied to both interstate and intrastate gas utility facilities.

Response: See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 17

Comment Excerpt: The National Grid Companies operate intrastate natural gas transmission pipelines and LNG facilities as part of the gas utility systems regulated by the utility commissions in, respectively, New York and Massachusetts. These intrastate facilities are subject to the same Subpart W reporting regulations as the interstate counterparts operated by others. While the National Grid Companies' parent, National Grid USA, only has one interstate facility, there are ongoing concerns about the potential unnecessary cost burdens on the upstream interstate pipeline suppliers that could be imposed by the proposed changes to Subpart W and passed through to the National Grid Companies' customers. The National Grid Companies support AGA's comments and INGAA's comments on EPA's Subpart W proposed revisions for natural gas distribution, transmission, storage, and LNG operations as applied to both interstate and intrastate gas utility facilities.

Response: See response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3.

Commenter Name: Charles E. Venditti
Commenter Affiliation: Countrymark Energy Resources, LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0181-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA has proposed revisions to the Greenhouse Gas Reporting rule, which includes requirements for the Oil and Gas exploration and production business segments to begin reporting activities. The revision proposal is 821 pages, of which approximately 170 pages enumerate requirements for the Oil and Gas exploration and production businesses.

Most of the companies operating in the Oil and Gas exploration and production business segment meet the definition of a small business. EPA did not conduct Small Business outreach prior to proposing the rule. This proposal will have a significant impact on small businesses, and we believe that EPA should have requested information from these small businesses about how the changes will impact the way that they operate.

Many small businesses do not have the technical expertise to meet the requirements. The small businesses cannot afford engineering, geology, and regulatory compliance staffs to develop the competencies necessary determine their emissions and report to EPA. Without inhouse talent to collect and submit the required data, operators will be required to use contractors. We are

concerned about the availability of contractors in the Illinois Basin that will be capable of providing the necessary services to comply with EPA's requirements.

Response: Regarding the costs associated with subpart W in this final rule, see response to comment EPA-HQ-OAR-2019-0424-0182-A1, Excerpt 3. However, the EPA evaluated the impacts to small businesses who would be newly required to report under each subpart due to the proposed revisions to Table A–1 of subpart A of part 98 in the 2023 Supplemental Proposal. Details of this analysis are presented in the memorandum, *Assessment of Burden Impacts for Proposed Supplemental Revisions for the Greenhouse Gas Reporting Rule*, available in the docket for this rulemaking (Docket Id. No. EPA–HQ– OAR–2019–0424). Based on the results of this analysis, we concluded that the proposed revisions to Table A–1 would have no significant regulatory burden for any directly regulated small entities (including subpart W) and thus that this proposed action would not have a significant economic impact on a substantial number of small entities.

Further, the final rule impacts have been revised to remove burden associated with proposed reporting under subparts A and B, therefore, consistent with our prior small entity analysis, would have no significant regulatory burden for any directly regulated small entities and thus would not have a significant economic impact on a substantial number of small entities (including subpart W). See section I.C of the preamble to the final rule for a discussion of EPA's actions regarding subpart W.

Commenter Name: Ryan Watts
Commenter Affiliation: Kentucky Oil and Gas Association (KOGA)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0182-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA has proposed revisions to the Greenhouse Gas Reporting rule, which includes requirements for the Oil and Gas exploration and production business segments to begin reporting activities. The revision proposal is 821 pages, of which approximately 170 pages enumerate requirements for the Oil and Gas exploration and production businesses.

Most of the companies operating in the Oil and Gas exploration and production business segment meet the definition of a small business. EPA did not conduct Small Business outreach prior to proposing the rule. This proposal will have a significant impact on small businesses, and we believe that EPA should have requested information from these small businesses about how the changes will impact their operations.

According to the Independent Petroleum Association of America (IPAA), there are approximately 9,000 independent producers in the United States, these companies operate 91% of the 937,000 wells (EPA's 2020 estimate). The median employment from these companies is 12 people. KOGA's members do not have the ability to absorb the additional cost of another employee to meet EPA's reporting requirements, which means that contractors will need to be hired to complete the work.

Many small businesses that we represent do not have the technical expertise to meet the requirements. Many Kentucky small businesses cannot afford engineering, geology, and regulatory compliance staffs to develop the competencies necessary to implement this type of program. Without inhouse talent to collect and submit the required data, operators will be required to use contractors. We are concerned about the availability of contractors in the Appalachian and Illinois Basins that will be capable of providing the necessary services to comply with EPA's requirements.

If local contractors are not available, we will need to find contractors that are not local, which provides another level of complexity and cost to our operators. With local contractors we can develop longer lasting relationships which will result in better operations of our assets. If we have contractors performing work from outside of Kentucky, we generally find that they complete the work and move on to the next job without having the benefit of the local relationship.

Response: See response to comment EPA-HQ-OAR-2019-0424-0181-A1, Excerpt 2.

Commenter Name: Stephanie Kromer
Commenter Affiliation: Ohio Oil and Gas Association (OOGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0246-A1
Comment Excerpt Number: 3

Comment Excerpt: Ohio's oil and gas industry is comprised of many operators that meet the definition of a small business. The Greenhouse Gas Reporting Rule will significantly impact smaller operators due to the large increase in reporting activities. A large number of these operators do not have the technical expertise or staff to comply with this large increase of costly reporting requirements. Before proposing this rule, the U.S. EPA should have conducted outreach to smaller operators to realize the impacts this rule will have on their day-to-day business functions.

Response: See response to comment EPA-HQ-OAR-2019-0424-0181-A1, Excerpt 2.

33.3 Comments on specific small business impacts

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 6

Comment Excerpt: EPA should adequately evaluate the costs of the rulemaking, including the cumulative regulatory impacts on businesses consistent with EO 18563. EO 18563 directs the

agency to "tailor its regulations to impose the least burden on society," while "taking into account...the costs of cumulative regulations."

To illustrate this point, the agency compares the annualized costs as a percentage of annual revenues in the Regulatory Flexibility Analysis section of the rule to claim it would only anticipate the costs to be less than 0.10 percent of sales. Although EPA has recommended the use of this method of considering the direct costs of regulations on the public in the agency's Guidelines for Preparing Economic Analyses, this method of comparing the ratio of costs to revenue does not consider the cumulative regulatory impacts of the current set of regulations and the large number of new regulations being issued by this agency and others across the federal government. Over the last 20 months, federal agencies have issued over 600 regulations (300 final rules and over 300 proposed rules) that are estimated to impose billions in costs on the public. For EPA alone, the agency's top ten air rules issued over the last 20 months are estimated by the agency to cost over $400 billion, more than the 1Q2022 individual state GDPs for 30 states and the District of Columbia.[16] EPA and other federal agencies often develop their regulatory proposals in isolation from one another, ignoring the cumulative regulatory burdens imposed on businesses. Businesses, however, do not have that luxury and are required to comply with all applicable federal regulatory requirements. The agency's cost-to-revenue ratio analysis also ignores the costs imposed on businesses by state agencies, many of which have ambitious regulatory agendas of their own.

Also, merely comparing costs against revenue ignores whether or not there are slim profit margins in a particular industrial sector or individual business. In the Regulatory Flexibility Act section of the preamble, EPA asserts it finds no significant impact on small businesses. With the agency adding numerous new recordkeeping and reporting requirements on additional new industry categories in the proposed rule, the time and cost burden will only increase and will be increasingly burdensome to smaller entities.

Footnotes

[16] Alabama, Alaska, Arkansas, Connecticut, Delaware, District of Columbia, Hawaii, Idaho, lowa, Kansas, Kentucky, Louisiana, Maine, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Utah, Vermont, West Virginia, Wisconsin, and Wyoming.

Response: The EPA disagrees with the commenter's objection to the EPA's use of estimated cost-to-revenue ratios to evaluate the impact of the proposed rules on small entities. The EPA follows the Guidelines for Preparing Economic Analyses and standardized analysis and screening practices for determining whether EPA could make a certification of no significant economic impact on a substantial number of small entities (SISNOSE) or whether additional regulatory flexibility analyses should be conducted. Under the direct compliance cost method, the compliance costs faced by small entities are compared to one or more financial statistics (*e.g.*, sales, profits, operating expenditures) of the regulated small entities. The EPA elected to use a cost-to-revenue ratio method because data on profits and operating expenditures are limited, especially for small businesses, and use of a cost-to-profits test would require us to estimate profits and expenditures for small businesses where there are currently insufficient data. The EPA also disagrees with the commenter's assertion that the Agency must account for the cumulative regulatory impacts of overlapping rules, including those that may be issued from other federal agencies or state regulatory agencies. The Regulatory Flexibility Act, as amended

by the Small Business Regulatory Fairness Act of 1996 (RFA), and Section 203 of the Unfunded Mandates Reform Act of 1995 (UMRA) require agencies to consider a proposed regulation's economic effects on small entities. As such, any screening or regulatory flexibility analysis is designed to evaluate the direct effect of a specific rulemaking, rather than assess the effects of other rulemaking processes. Given that individual rulemakings within and outside the agency may be subject to separate authorities, Congressional directives, or Court-ordered requirements; follow separate review processes and schedules; and are refined through the public comment and response process, the EPA appropriately accounts for the impacts associated with the burden of a specific action. Concerns regarding the impacts of specific rulemakings cited by the commenter are outside of the scope of this rulemaking, and should be appropriately submitted to the specific rulemaking of concern.

The EPA determined that the revisions in the 2022 Data Quality Improvements Proposal would not have a significant impact on a substantial number of small entities, as discussed in Section VIII.C of the proposed rule. At that time, the EPA requested comment on the potential development of requirements for additional new industry source categories, but had not yet developed specific requirements for which it could estimate costs for the potential new source categories. The EPA subsequently published its 2023 Supplemental Proposal on May 22, 2023, in which it examined the compliance costs for facilities subject to new reporting as well as facilities that may incur other significant costs. In order to more accurately account for the potential burden to small entities in subparts affected by both rulemakings, the EPA considered the costs based on the revisions from the 2022 Data Quality Improvements Proposal and the supplemental proposed rule in its analysis of small business impacts. The EPA subsequently determined that the impacts from the 2023 Supplemental Proposal would have no significant regulatory burden for any directly regulated small entities. See section 4.0 of the memorandum, *Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule* (May 2023) for additional details on the EPA's subsequent small business analysis.

EPA has reviewed the burden and cost estimates from the 2022 Data Quality Improvements Proposal and the supplemental proposed rule and has subsequently revised these estimates to better reflect the number of reporters potentially affected by the final revisions, based on review of RY2022 data, and to reflect the changes of the final rule. The final costs of the final rule are included in the memorandum *Assessment of Burden Impacts for Final Revisions for the Greenhouse Gas Reporting Rule*, available in docket EPA-HQ-OAR-2019-0424. See section VIII.C of the preamble to the final rule for EPA's discussion of the impacts of the final rule on small entities.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 5

Comment Excerpt: The agency should also provide further analysis of the cost burden impacts of this action across different sized companies, beyond using average numbers. The agency should also report the range of costs from the high end to the low end of the cost impacts, to be more transparent concerning the differential impacts for various businesses and sectors. By comparing the average cost of the program to the average company revenue, the resulting percentage of that cost compared against company revenue may seem small but will likely be a larger cost burden and more impactful when compared with smaller business revenue.

Response: Regarding the range of costs that may apply to part 98 reporters, see response to comment EPA-HQ-OAR-2019-0424-0244-A1, Excerpt 4 in section 32.3 of this document. The EPA's impacts analyses provide detailed information of the range of costs to individual facilities in each subpart. For assessment of impacts to small entities, the agency examined the compliance costs for all facilities, with particular attention to those facilities subject to new reporting as well as facilities that may incur other significant monitoring or calculation costs. In the impacts analysis to the 2022 Data Quality Improvements Proposal, these per facility costs, where significant, were assessed considering the range of business sizes most likely to be impacted.

In the EPA's supplemental proposed rule, the agency also examined the compliance costs for all facilities, including facilities subject to new reporting as well as facilities that may incur other significant costs. Given the potentially large number of facilities impacted by the 2023 Supplemental Proposal, the EPA conducted a more in-depth screening analysis for reporters subject to new requirements. Further, in order to more accurately account for the potential burden to small entities affect by both rulemakings, the EPA considered the costs based on the revisions from the 2022 Data Quality Improvements Proposal and the supplemental proposed rule in its analysis of small business impacts. The impacts analysis to the supplemental proposed rule, *Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule* (April 2023), examined the significant costs of the rule for all entities in the size ranges of 1-99 employees, 100-499 employees, and 500+ employees. The EPA subsequently determined that the impacts from the 2023 Supplemental Proposal would have no significant regulatory burden for any directly regulated small entities. See section 4.0 of the memorandum, *Assessment of Burden Impacts for Proposed Supplemental Notice of Revisions for the Greenhouse Gas Reporting Rule* (April 2023) for additional details on the EPA's subsequent small business analysis. EPA has reviewed the burden and cost estimates from the 2022 Data Quality Improvements Proposal and the supplemental proposed rule and has subsequently revised these estimates to better reflect the number of reporters potentially affected by the final revisions, based on review of RY2022 data, and to reflect the changes of the final rule. The EPA also reviewed whether the final rule revisions would revise its small business impacts analysis. See section VIII.C of the preamble to the final rule for EPA's discussion of the impacts of the final rule on small entities. Details on the final costs and EPA's small business analysis of the final rule are included in the memorandum *Assessment of Burden Impacts for Final Revisions for the Greenhouse Gas Reporting Rule*, available in docket EPA-HQ-OAR-2019-0424.

34.0 General Comments on EPA's Legal Authority

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 10

Comment Excerpt: EPA's authority to collect information under section 114 is specifically circumscribed. The Administrator may require the submission of information "[for the purpose ... of developing or assisting in the development of any implementation plan under" sections 110 or 111 of the CAA, any standard of performance under section 111, and emission standard under section 112, regulations related to solid waste, or for purposes "of determining whether any person is in violation of any such standard or any requirement of such a plan." [21] Section 114 further authorizes the collection of information for the purpose of carrying out any provision of chapter 85 of title 42.[22]

Prior to the promulgation of the GHGRP, EPA had never used section 114 to require the indefinite, if not permanent, gathering and reporting of data. After many years of collecting GHG data pursuant to subpart W, GPA appreciates EPA's efforts to streamline its regulatory requirements and ease reporting burdens. Nevertheless, GPA remains concerned that EPA has not explained, consistent with the limits on the agency's section 114 authority, the reasons for its continuation of the GHGRP, the agency's ultimate regulatory goals, and the information EPA needs to ensure compliance with the rules it has already promulgated. Indeed, for sources that are already subject to emission limits, tailoring reporting requirements to what is needed to determine whether any source is in violation of an applicable standard should be the primary focus of EPA's rulemaking. At the very least, EPA is obligated to fully explain how its proposed rule is consistent with its section 114 authority. GPA encourages EPA to engage this issue in a supplemental proposal or in its final rule.

Footnotes

[21] CAA § 114(a); 42 U.S.C. § 7414(a).

[22] Id.

Response: The EPA disagrees that we should or must interpret the language of CAA section 114 as narrowly as the commenters advocate, and thus also disagrees that EPA must reevaluate and justify continuation of the overall GHGRP in this final rule. Please see section I.D of the preamble to the final rule for further information on EPA's authority for this final rule, which references EPA's articulation of its authority under CAA section 114 when promulgating the GHGRP, and the preamble for the final rule and this Response to Comments document for EPA's supporting rationale for the revisions in this final rule under that authority. As we explained in the original preamble to the Mandatory Reporting of Greenhouse Gases final rule (74 FR 56260, October 30, 2009) promulgating the GHGRP and its corresponding Response to Comments document, while Congress highlighted certain potential uses of the information that could be gathered under CAA section 114 in a portion of CAA section 114(a), Congress also explicitly listed in CAA section 114(a) the potential use of "carrying out any provision" of the Act. We also explained that the EPA has a variety of duties in the CAA that extend to both regulatory and non-regulatory programs (including under section 103(g) of the CAA), and limiting the scope of CAA section 114 as some commenters urge would hinder the EPA's ability to implement those provisions, thereby subverting Congressional intent. We also explained that

the point of gathering information under CAA section 114 is to inform decisions regarding the legal, technical, and policy viability of various options for carrying out provisions under the CAA (which is not limited to determining compliance with existing regulations).

As stated in the preamble to the 2009 Mandatory Reporting of Greenhouse Gases final rule, CAA section 114(a)(1) provides the EPA broad authority to require the information to be gathered by this rule because such data would inform and are relevant to the EPA's carrying out of a variety of CAA provisions. As summarized in the 2009 proposed rule, CAA section 114(a)(1) authorizes the EPA to, *inter alia*, require certain persons on a one-time, periodic, or continuous basis to keep records, make reports, undertake monitoring, sample emissions, or provide such other information as the EPA may reasonably require. The EPA may require the submission of this information from any person who (1) owns or operates an emission source, (2) manufactures control or process equipment, (3) the EPA believes may have information necessary for the purposes set forth in this section, or (4) is subject to any requirement of the Act (except for manufacturers subject to certain title II requirements, who are subject to CAA section 208). The EPA may require this information for the purposes of developing or assisting in the development of any implementation plan, an emission standard under sections 111, 112 or 129, determining if any person is in violation of any such standard or any requirement of an implementation plan, or "carrying out any provision" of the Act. As the EPA noted in the 2022 Data Quality Improvements Proposal, in the development of the GHGRP in the 2009 rule, the Agency considered its authorities under CAA sections 114 and 208 and the information that would be relevant to the EPA's "carrying out" a wide variety of CAA provisions when identifying source categories for reporting requirements. We noted both the scope of the persons potentially subject to a CAA section 114(a)(1) information request (*e.g.*, a person "who the Administrator believes may have information necessary for the purposes set forth in" CAA section 114(a)) and the reach of the phrase "carrying out any provision" of the Act and explained how the reporting requirements being promulgated under the GHGRP for facilities and suppliers were within that authority. As the EPA explained in initially promulgating the GHGRP, it is entirely appropriate for the Agency under CAA section 114 to gather such information (including but not limited to better understanding the reporting industries and their potential impacts, and verifying reported emissions information, from upstream production and suppliers to downstream sources), to allow a comprehensive assessment of how to best address GHG emissions and climate change in carrying out provisions of the CAA, including both regulatory and non-regulatory options.

As noted in the 2022 Data Quality Improvements Proposal (87 FR 36927) and 2023 Supplemental Proposal (88 FR 32857), and further explained in this document and the preamble for this final rule, the amendments are relevant to the EPA's carrying out of provisions in a number of ways. First, the amendments identified new emissions or new emission sources from direct emitters that could inform decisions about whether and how to use section 111 of the CAA to establish NSPS for various source categories emitting GHGs. We also note that information collected under the GHGRP could be helpful in rulemakings in carrying out such regulatory provisions under the CAA in better understanding potential impacts or potential considerations for compliance options, to the extent such information informs a more comprehensive understanding by EPA (*i.e.*, EPA's CAA section 114 authority to collect such information is not limited to information that is directly used as the basis for setting emission standards). The data may also inform the EPA's implementation of section 103(g) of the CAA regarding

improvements in nonregulatory strategies and technologies for preventing or reducing air pollutants. The data published under the GHGRP serves to enable the Agency and stakeholders to understand, track, and compare greenhouse gas emissions and identify emission reduction opportunities. The amendments are intended to address data gaps that have been identified in the implementation of the program or from review of improved scientific assessments and would allow the EPA to better characterize U.S. GHG emissions, which would subsequently better inform other agency policies and programs under the CAA. In other cases, we proposed updates to emission factors or revisions to emissions estimation methodologies that are more representative of GHG emissions sources and would improve the overall accuracy of the data collected under the GHGRP; these revisions ultimately benefit stakeholders who rely on GHGRP data to understand the sources and magnitude of GHGs from specific facilities, as well as improve the quality of data used to inform future EPA policy or regulation under the CAA. We also proposed revisions to existing reporting requirements to improve the quality of the data that are currently reported, or to collect more useful data that would improve verification of reported data. Such revisions would better characterize U.S. GHG emissions and trends and would better enable the EPA to obtain data that is of sufficient quality that it can be used to support a range of future climate change policies and regulations in carrying out provisions of the CAA, including but not limited to information relevant to carrying out provisions involving research, evaluating and setting standards, endangerment determinations, or informing EPA non-regulatory programs. The EPA additionally uses the data from the GHGRP to improve estimates used in the U.S. GHG Inventory. With these considerations, the revisions fall well within the EPA's statutory authority under CAA section 114. The EPA additionally uses the data from the GHGRP to improve estimates used in the U.S. GHG Inventory.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 12

Comment Excerpt: While the MSC has focused the majority of its comments on technical aspects of the proposed rulemaking, it is nonetheless important to also provide comment regarding the underlying authority and purpose of the proposed rulemaking. In many respects, the new and expanded reporting obligations that this rulemaking will impose upon the regulated community will provide negligible, if any, environmental benefit to public health, the environment, or the public generally. The EPA fails to outline the benefit or purpose that will be achieved with the submission of this information.

Fundamentally, it is the obligation of an agency promulgating a rulemaking to clearly outline both the statutory authority and purpose of imposing additional regulatory requirements on the regulated community. Such an explanation, let alone an analysis that the cost and workload imposed upon operators will result in a greater or commensurate benefit to the public, is conspicuously absent. The MSC urges all parties involved in reviewing this proposed rulemaking, including the Office of Management and Budget and congressional oversight

committees, to have EPA revisit this issue and make a clear demonstration of its need prior to advancing a final rulemaking.

Response: For the EPA's response to comments regarding the EPA's statutory authority for the proposed revisions, see response to EPA-HQ-OAR-2019-0424-0199-A1, Excerpt 10. Regarding the comment that the EPA failed to outline the benefits or purpose of the proposed rule, the EPA outlined the rationale and benefits of the revisions in sections II and III of the preambles to the 2022 Data Quality Improvements Proposal and 2023 Supplemental Proposal, providing additional information on the use and utility of the data in the information collection request statements (ICRs 2300.19 and 2773.01) that were provided to the Office of Management and Budget for review. Further, in this final rule, the purpose, impacts and benefits of the rule to stakeholders, the Agency, and the general public are included in sections II and VII of the preamble the final rule.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA should ensure that any new or revised recordkeeping and reporting requirements meet the requirements of the Paperwork Reduction Act (PRA) regarding maximizing the utility and quality of the information collected. EPA estimates that 85- 90% percent of U.S. GHG emissions are already reported under the GHGRP without considering the addition of other sectors as proposed. With almost all U.S. GHG emissions already being reported through the program, the agency should explain the practical utility of each additional requirement that would augment reporting burdens.

The Paperwork Reduction Act (PRA) requires agencies to ensure the "practical utility" of any collected information, practical utility is defined in the PRA implementing regulations as follows: "Practical utility means the actual, not merely the theoretical or potential, usefulness of information to or for an agency, taking into account its accuracy, validity, adequacy, and reliability, and the agency's ability to process the information it collects (or a person's ability to receive and process that which is disclosed, in the case of a third-party or public disclosure) in a useful and timely fashion..."[8]

The agency should explain the actual usefulness of the information collected, not just the theoretical or potential usefulness for some distant, future regulatory policy. Providing explanations for why the agency is collecting each subset of data will help inform the agency whether certain data elements are truly useful.

Footnotes

[8] 5 CFR Part 1320.3(I).

Response: The EPA provided information on the practical utility of the data collected under the GHGRP, including the data to be collected from the amendments included in the 2022 Data Quality Improvements Proposal and 2023 Supplemental Proposal, in the information collection request statements (ICRs 2300.19 and 2773.01) that were provided to the Office of Management and Budget for review and submitted to the docket. Further information regarding the utility and benefits of specific amendments are provided in sections II and III of the preambles to the 2022 Data Quality Improvements Proposal and 2023 Supplemental Proposal. See response to comment EPA-HQ-OAR-2019-0424-0192-A1, Excerpt 10 for the relevance of the amendments to the EPA's carrying out of a variety of CAA provisions and response to comment EPA-HQ-OAR-2019-0424-0199-A1, Excerpt 12 for additional information on the benefits of the amendments.

35.0 Comments on EPA Requirements for Statutory and Executive Orders

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 6

Comment Excerpt: AIPRO strongly objects to the "Significant Energy Action" determination found in the preamble to the proposed GHGRP revisions. AIPRO argues that the proposed revisions to the GHGRP, especially when combined with the proposed NSPS OOOOb and EG OOOOc rules and the "waste emissions charge" (or "methane tax") provisions of the Inflation Reduction Act ("IRA"), absolutely represent a "Significant Energy Action." and a threat to the affordable and reliable American oil & gas resources that provide the majority of energy to America. The combined effects of the proposed rules and IRA legislation will likely cause the following:

- Many low producing ("marginal") wells and related oil & gas operations would become uneconomic and therefore be shut-in or idled.
- Inflated (quite the opposite of inflation reduction) operating costs, including compliance and tax costs, for wells and associated oil & gas operations that are able to bear the burden of the costs.
- Continue to push away sources of capital investment, or at a minimum increase the cost of capital, for the oil & gas industry, which are already becoming sparse, and ultimately:
- Result in higher commodity prices for end users of oil & gas in America

In aggregate the impacts very much represent a "Significant Energy Action" and a threat to the affordable and reliable American oil & gas resources that provide the majority of energy to America.

Response: The EPA is not taking final action on revisions to subpart W from the 2022 Data Quality Improvements Proposal in this final action. See section I.C of the preamble to the final rule for a discussion of EPA's actions on Subpart W. See section VII.H of the preamble to the final rule for EPA's rationale for the determination that this final action is not a "significant energy action" under Executive Order 13211.

36.0 General Support

Commenter Name: Anonymous
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0167
Comment Excerpt Number: 1

Comment Excerpt: The EPA proposed amendment is a great step in the right direction, with better data quality, information gathering and reporting of GHGs. This update will be the first significant change to the Green House Gas Reporting Program (GHGRP, 40 CFR Part 98) since 2009.

Response: EPA acknowledges the commenter's support for the proposed rule.

Commenter Name: Claire Chase
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0168
Comment Excerpt Number: 1

Comment Excerpt: It is commendable and crucial to update and improve emission estimating methodologies. We support updating the quality and consistency of data to improve our GHG standards. It is vital that we bridge the gaps in our reporting to effectively report all emissions including new sources identified.

Response: EPA acknowledges the commenter's support for the proposed rule.

Commenter Name: Anonymous
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0169
Comment Excerpt Number: 1

Comment Excerpt: I agree with the proposed changes to Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting (GHGRP) Rule. While the ins and outs of these proposed changes are too complex to fully grasp for someone who is not an expert in this particular field, I can give my general opinion on the issue. According to IPCC Fifth Assessment Report, GHGs emitted as a result of human activity are the leading cause of climate warming since the mid-20th century. At the same time, GHGs emissions from human activities increased by 43% between 1990 and 2015, while the total warming effect from GHGs from human activities increased by 45% between 1990 and 2019. Transportation, Electricity Generation, and Industry are the three leading sectors in GHGs emissions with 27%, 25%, and 24% of GHGs contributed in 2020 respectively. With this said, I believe that accurate, standardized measurement of GHGs emissions by the leading contributors is key to understanding, evaluating, and monitoring GHGs effect on the environment as well as driving the positive change through informed policymaking. At the same time, as the industry changes, the standards for collecting and evaluating data should change as well. With the rapidly-changing industry what worked 10 years ago is not necessarily applicable today.

Response: EPA acknowledges the commenter's support for the proposed rule.

Commenter Name: Kaine Cogan
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0174
Comment Excerpt Number: 1

Comment Excerpt: I support this rule. Collection of sound data is needed for any policy decisions and at the current time we do not have good tools to make educated choices about emissions. Regardless of the scope of the data collection process we need more info about how much emissions 2 stroke engine cargo ship or trucks product compared to a moped, and how much a moped produces as it is likely to have a fairly weak catalytic converter thus emitting more mono-carbon and hydrocarbon. More information about how much Petroleum refineries emit would also allow citizens to make more informed decisions when considering EV technology. The data collected will only become more important as time goes on.

Response: EPA acknowledges the commenter's support for the proposed rule and notes that some points raised by the commenter are outside the scope of this rulemaking. We did not propose or request comment on reporting of direct emissions from mobile sources; therefore, we are not taking any final action on such requests in this final rule.

Commenter Name: Anonymous
Commenter Affiliation:
Commenter Type: Private Citizen
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0177
Comment Excerpt Number: 1

Comment Excerpt: I agree that there should be better data that is collected revolving around carbon emissions. I think that creating simpler easy calculations will cause the most benefit resulting in better data that will tell us more about what industries and factories are causing the most harm, along with the new calculations, reporting requirements will also greatly influence the data that is already kept. This will allow us to see how much carbon emissions are being created and let us resolve and reduce the amount to better our atmosphere and create less population for healthier lifestyles.

Response: The EPA acknowledges the commenter's support for the proposed rule.

Commenter Name: Patrick Serfass
Commenter Affiliation: American Biogas Council (ABC)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0313-A1
Comment Excerpt Number: 1

Comment Excerpt: The ABC is very supportive of the use of data in establishing regulations and agrees that it is a good practice to adjust regulations in accordance with new information, new technology, and new data, and we commend the EPA for reviewing data elements that relate to GHG reporting. Although some of the new regulations outlined in this proposed rule will necessitate increased reporting from some of our members, we believe that these requirements are not overly burdensome.

Response: EPA acknowledges the commenter's support for the proposed rule.

37.0 Out of Scope Comments

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 16

Comment Excerpt: Under current GHGRP rules as well as proposed GHGRP revisions, there are multiple scenarios where emissions may be “double-counted,” some of these include the below:

- Same reporter, required to report under multiple GHGRP subparts due to operational makeup

AIPRO encourages EPA to identify and eliminate all potential double-counting scenarios. AIPRO welcomes the opportunity to collaborate with the agency on this effort.

Response: The EPA understands that this commenter is concerned about double counting of emissions. This comment is outside the scope of the current rulemaking. We note that EPA previously responded to comments on the 2009 Proposed Rule regarding the potential double counting of emissions. The EPA acknowledged that there is inherent double reporting of emissions in a program that includes both upstream and downstream sources but that double reporting is not inherently the same as double counting. Further, the EPA noted at that time that the rule responds to a specific request from Congress to collect data on GHG emissions from both upstream production and downstream sources, as appropriate (74 FR 56271, October 30, 2009).

Commenter Name: Campbell Pryde
Commenter Affiliation: XBRL US, Inc.
Commenter Type: Other
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0196-A1
Comment Excerpt Number: 1

Comment Excerpt: In a comment letter[1] to the EPA on November 21, 2021, we urged the EPA to consider adopting machine-readable data standards to ensure access to clean, consistent, timely and detailed data, and to track the progress of programs more effectively. We ask that the Agency revisit how data is required to be reported and modernize their data publication so that data is provided in machine readable format, rather than spreadsheets that require manual extraction and processing. Unambiguous, machine-readable data can be automatically checked and consumed by data users, has higher data integrity, is self-explanatory, and is significantly more timely. The benefits of data standardization are further described in the November 21 letter.

Footnotes

[1] XBRL US Comment on EPA Strategic Plan 2022-2026, November 12, 2021: https://xbrl.us/wpcontent/uploads/2021/11/XBRL-US-Comment-EPA-Strategic-Plan-2022-2026.pdf

Response: The EPA did not propose, and has not solicited public comment for, revisions to part 98 that would incorporate machine-readable data standards, and is not taking final action on such revisions at this time. This comment is therefore outside the scope of the current rulemaking. EPA may consider this comment in the future.

Commenter Name: Campbell Pryde
Commenter Affiliation: XBRL US, Inc.
Commenter Type: Other
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0196-A1
Comment Excerpt Number: 2

Comment Excerpt: We also wish to point out how consistent identifiers can be used to improve reporting and collection efficiencies. The information reported in the parent company schedule of the GHGP data set uses the parent company name, address and NAICS code as the method to identify the owner of the reporting facility. This data is used to cross reference the GHGP data to the companies' regulatory filings to the Securities and Exchange Commission (SEC) or to the Federal Energy Regulatory Commission (FERC) if they are regulated by either of these agencies. The absence of standardized identifiers associated with the parent company makes it difficult and time consuming to easily and unambiguously identify the parent company. We ask the EPA to consider adopting the Legal Entity Identifier (LEI) as a consistent, global identifier which is not specific to any regulatory agency, available to all the entities reporting this data to the EPA, and ideally suited to track parent companies reported. The LEI was instigated by the Federal government for the banking sector and would also be a good fit for the tracking of companies involved in GHG reporting.

While not the preferred solution, the EPA could alternatively require publicly traded companies to include the Central Index Key (CIK) assigned to each public company by the SEC, or the Company Identifier (CID) assigned to public utility companies by the FERC. This would be a significant improvement over the current process.

Response: The EPA did not propose, and has not solicited public comment for, revisions to part 98 that would incorporate standardized identifiers, and is not taking final action on such revisions at this time. As such, this comment is outside the scope of the current rulemaking. EPA may consider this comment in future revisions to part 98.

Appendix A. Comments Received on Subpart W (Petroleum and Natural Gas Systems)

This appendix includes the comments received on proposed revisions to subpart W (Petroleum and Natural Gas Systems) in the 2022 Data Quality Improvements Proposal (87 FR 36920, June 21, 2022). The EPA is not taking final action in this final rule on the proposed revisions to subpart W (Petroleum and Natural Gas Systems) and has not included responses to those comments in this action. As noted in sections I.C of the preamble to the final rule, the EPA issued a subsequent proposed rule for subpart W on August 1, 2023 (88 FR 50282) and requested commenters resubmit any relevant comments regarding the proposed revisions to subpart W in that action.

A-1. General Comments re: Revisions to subpart W (Petroleum and Natural Gas Systems)

Commenter Name: Charles E. Venditti
Commenter Affiliation: Countrymark Energy Resources, LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0181-A1
Comment Excerpt Number: 3

Comment Excerpt: The rule structure that has been proposed by EPA is very complicated. The proposed rule has so many references from one section to another section, we believe that many of the readers will not invest the time to understand the rule in its entirety. While we understand why EPA writes the rules in this format, it is challenging to be able to understand how all the pieces fit together. We recommend EPA provide a simplified training program for Oil and Gas operators to be able to understand their requirements. The training program should be available before compliance is required.

Commenter Name: Ryan Watts
Commenter Affiliation: Kentucky Oil and Gas Association (KOGA)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0182-A1
Comment Excerpt Number: 2

Comment Excerpt: The rule structure that has been proposed by EPA is very complicated. The proposed rule has so many references from one section to another section that many of the readers will not spend the time to understand the requirements. While we understand why EPA writes the rules in this format, it is challenging to be able to understand how all the pieces fit together. We recommend EPA provide a simplified training program for Oil and Gas operators to be able to understand their requirements. The training program should be available before compliance is required.

KOGA has been advocating that a "one size fits all" regulation does not work for the Oil and Gas exploration and production industry for many years. This dialogue has primarily been through discussions about NSPS OOOOa. In an attempt to cover all of the segments of our industry and develop a rule that is not just a "one size fits all" concept, the rule is overly complicated.

Commenter Name: Brian K. Woodard
Commenter Affiliation: Chesapeake Energy Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0216-A1
Comment Excerpt Number: 6

Comment Excerpt: Subpart W needs to provide flexibility to use more accurate methodologies so that reported emissions are representative of actual emissions. Throughout the proposed Subpart W reporting regulation, there are opportunities to develop calculation methodologies to allow reporting of more accurate emissions. In several instances, the calculation methodology in the existing regulation generates an emission estimate that is significantly greater than actual emission rates. This rigid approach, while easier, does not provide incentive to reduce emissions and results in an unclear understanding of the actual emissions. Sources in the regulation that should allow alternative methodologies include flowbacks, pneumatic pumps, pneumatic devices, and the proposed combustion methane slip requirements.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 11

Comment Excerpt: The final rule should provide clear explanations that year-over-year increases do not necessarily reflect changes in actual emissions, but rather changes in accounting methods. In particular, an explanation is needed for updates to natural gas-fired reciprocating engine methane exhaust emission factors and for facility leak emissions should EPA adopt a higher emission factor for OGI leak surveys.

INGAA members have worked diligently over the years to accurately report and reduce GHG emissions. The proposed emission factors, if adopted in a final rule, along with new emission sources will result in significant increases in year-over-year GHG emissions for the first year even if facilities operate exactly as they had in the prior year. This apparent increase in emissions on paper might be misunderstood. It is therefore important that EPA carefully craft messaging that can help the public, environmental advocacy groups, shareholders, and the international community understand that increased emissions numbers due to the Proposed Rule are associated

with changes to calculating methodologies and are not necessarily reflective of actual increases in GHG emissions from reporting facilities.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 69

Comment Excerpt: Nitrogen Removal Units (NRU), also known as Nitrogen Rejection Units, are process units in natural gas processing and LNG production segments of the oil and gas industry used to decrease the nitrogen content in the natural gas to meet the desired heating value specifications established by the operator. The capacity of the NRU is designed depending on the nitrogen concentration in the feed gas entering the facility and a desired heating value of the natural gas product. For examples, a natural gas processing facility with a throughput of over 700 MMSCD of gas with a composition of over 60% CO_2, ~20% methane, over 7% nitrogen, and remaining balance with hydrogen sulfide and helium goes through several treatment processes to remove contaminants and achieve the desired heating value for their product. After the natural gas is stripped of hydrogen sulfide, carbon dioxide and water at the beginning, the composition of the natural gas becomes ~68% methane, 30% nitrogen, and 2% helium, and it goes through a cryogenic process to remove the excess nitrogen in the natural gas. During this separation process, a fraction of methane is vented with nitrogen that is removed from the natural gas.

Recognizing the vast variabilities in facility operations, it is critical to mandate reporting of the methane emissions from the NRU vent from all onshore natural gas processing and LNG export/import facilities to improve the accuracy of the GHGRP inventory and better understand the mitigation opportunities to reduce methane from NRUs. EPA should require operators to use a continuous emissions monitoring system (CEMS), vent meter, a simulation software, or calculation methods that use mass balance equations to account for and report the vented methane emissions from all NRU vents. EPA must take measures to investigate how to improve methane emissions reporting requirements from the vent stack associated with NRUs.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 45

Comment Excerpt: Nitrogen Removal Units (NRU), also known as Nitrogen Rejection Units, are process units in natural gas processing and LNG production segments of the oil and gas

industry used to decrease the nitrogen content in the natural gas to meet the desired heating value specifications established by the operator. EPA does not require reporting of methane emissions from NRUs for any industry segment, but these emissions can be significant, and operators of NRUs in the gas processing, LNG storage, and LNG import/export segments should be required to report these emissions.

Natural gas feed with nitrogen levels greater than 7% generally undergoes nitrogen removal because maximum nitrogen content in pipelines is typically set between 4-7%.[76] Studies performed by Gas Research Institute in 1993 found that 14% of known reserves in the U.S. are subquality due to high nitrogen content.[77] Production from these contaminated reserves has been substantial for many years. A report produced by Membrane Technology and Research, Inc., for the Department of Energy in 1999 gives a regional distribution of high-nitrogen reserves, with nitrogen concentrations 4% or more, in the US.[78]

Table 7. Distribution of Non-Associated Gas with 4% or More Nitrogen in 1988 Reserves.[79]

Region	High Nitrogen Natural Gas (TCF)
Mid-Continent	15.31
Rocky Mountain Foreland	3.61
Arkla-East Texas	1.67
Permian Basin	0.94
West Coast Onshore	0.89
Williston Basin	0.4
Midwest	0.3
Appalachia	0.1

The report lists several natural gas processing facilities with NRUs in the 1990s and provides the plant capacity and nitrogen content in the feed gas entering the processing facility. [80] Many of the facilities highlighted in the report have continued operation to this day and routinely emit methane from the NRU vents and must be required to report their methane emissions.

This is significant for methane emissions because the nitrogen vents from NRUs are typically contaminated with methane. Existing literature cites methane content in the concentrated nitrogen vent stream to range between 0.5-3% based on the design and operation of the NRU. [81] Simple arithmetic dictates that if raw natural gas contains 15% nitrogen, and this is reduced to 5% using NRUs which vent a mixture of 97% nitrogen and 3% methane, the nitrogen removal process vents over 0.3% of its output processed gas as methane – a very significant contribution to the total emission rate for that gas. Given the large quantity of nitrogen-contaminated gas being produced today, and potentially in the future, this source could certainly account for tens of thousands of tons of methane emissions annually. Additionally, as facilities increase the flowrate through the NRU to increase production of natural gas, the operation efficiency of the NRU may decrease which increases the amount of methane in the nitrogen vent stack. [82] Facilities processing a large amount of nitrogen-contaminated natural gas, can be venting a significant amount of methane emissions, and should be accounted for in the GHGRP. Furthermore, optimization of NRUs can significantly reduce emissions, [83] so requiring operators to report NRU methane emissions call attention to this source of potential mitigation.

EPA should require operators to use a continuous emissions monitoring system (CEMS), vent meter, simulation software, or calculation methods that use mass balance equations to account for and report the vented methane emissions from all NRU vents. EPA should also take measures to investigate how to improve methane emissions reporting requirements from the vent stack associated with NRUs.

Footnotes

[76] Kuo et al., Pros and cons of different Nitrogen Removal Unit (NRU) technology, 7 J. Nat. Gas Sci. & Engineering 52 (2012), https://www.sciencedirect.com/science/article/abs/pii/S1875510012000170.

[77] U.S. Office of Scientific and Technical Information, Nitrogen removal from natural gas (2017), https://www.osti.gov/servlets/purl/493341.

[78] Membrane Technology and Research, Inc., Nitrogen Removal from Natural Gas Phase II Draft Final Report (1999), https://www.osti.gov/servlets/purl/780455/.

[79] Id.

[80] Id.

[81] EPA, Nitrogen Rejection Unit Optimization (2011), available at https://www.epa.gov/natural-gas-star1program/recommended-technologies-reduce-methane-emissions.

[82] Id.

[83] Id.

Commenter Name: Karen Knutson
Commenter Affiliation: Chevron
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0184-A1
Comment Excerpt Number: 1

Comment Excerpt: For the proposed revisions to Subpart W, we appreciate EPA efforts to update methane emission factors using the latest field measurement studies, including work on equipment leaks and pneumatic controllers that was co-authored by our experts. We also support the provision of additional reporting guidance aimed at increasing calculation input consistency across Subpart W reporters.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 3

Comment Excerpt: In addition to the highlighted changes listed below, GPA also includes Appendix A to these comments, which is a table of other proposed changes that GPA supports.

- Alignment of the onshore natural gas processing definition with NSPS OOOOa through targeted consistency changes [40 CFR 98.230(a)]
- Removal of the 25 million standard cubic feet ("MMscf") per day threshold in the definition of natural gas processing [40 CFR 98.230(a)]
- Streamlining reporting of hydrocarbon liquid throughputs under Subparts W and NN [98.236(aa)(3)]
- Addition of reporting element of the count of compressor stations within a basin to facilitate better understanding of G&B operations [98.236(aa)(10)(v)]. Please see comment below with respect to making this count more representative of G&B facilities.
- For G&B, allowing use of engineering estimates based on best available data to determine the concentration of gas hydrocarbon constituents in the flow of gas to the combustion unit [98.233(z)(3)(ii)(B)]
- Removal of desiccant dehydrators as a distinct emission source [98.233(e)(3)] and inclusion of desiccant dehydrator blowdowns under 98.233(i)
- Including a new option to survey natural gas intermittent bleed pneumatic devices and calculate emissions based on properly functioning devices and malfunctioning devices [98.233(a)(6)] o Please see comment below with respect to "complete" surveys.
- Allowing use of calibrated bags and high-volume samplers for centrifugal compressor wet seal oil degassing vent measurements [98.233(0)(2)/(ii)]
- Removal of redundant reporting requirements of manifolding/controls at both the compressor and leak/vent level [98.236(0)(1)(vi) through (ix) and 98.236(p)(1)(vi) through (ix)]
- Adding total hydrocarbon leaker emission factors for onshore natural gas processing for Method 21 at 500 ppm [Table W–2A]

A-2. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for natural gas pneumatic device vents

Commenter Name: Dan Naatz
Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Supplemental
Document Control Number: EPA-HQ-OAR-2019-0424-0326-A1
Comment Excerpt Number: 3

Comment Excerpt: Each EF carries with it a history of its development and evolution. Intermittent pneumatic controllers used in oil and natural gas production have been an example

of the challenge of developing accurate information. Intermittent pneumatic controllers operate only when they activate. Correspondingly, they emit when they activate unless they are failing for some reason. Intermittent pneumatic controllers are one of the most pervasive pieces of equipment at oil and natural gas production facilities. Consequently, they are one of the largest emissions sources for these operations. At issue is the validity of the EF for this equipment.

The current EF for intermittent pneumatic controllers is 13.5 scf/hour/component. This EF was developed the mid-1990s based on data collected from 19 controllers. It is hardly an example of robust data acquisition. Since then, the validity of this EF has been consistently questioned. It has become a higher profile issue as various environmental lobbying groups have produced reports based on the GHGI that is largely developed using the GHGRP.

Over the years other studies have been done to address this EF. EPA only in 2022 proposed some new options. However, the quality of its analysis of this EF that has been such a target is wanting. In general, EPA discusses six studies that have been done with information on intermittent pneumatic controllers for production operations (GRI/EPA 1996, Allen, Thoma, Prasino, OIPA and API 2019). Additionally, EPA assessed a Department of Energy study on gathering and boosting operations (DOE G&B). In each case EPA discusses the limitations of the studies – short sampling times with assumptions about the activation period for intermittent controllers, emissions that are calculated rather than measured, and classification issues. Then, EPA eliminates two studies (Thoma, OIPA) apparently because of their use calculated emissions (which were far lower than some of the other studies). Subsequently, it produced the following summary table:

[See DCN EPA-HQ-OAR-2019-0424-0326-A1 for Table 2.9 Comparison of Population Emission Factors for Natural Gas Pneumatic Device Venting for Production and G&B Industry Segments]

Next, EPA averaged the intermittent factors for these studies to produce a new EF of 8.8 scf/hr. However, this appears to include the EF from the DOE G&B study; if it had not, the EF would appear to be 8.2 scf/hr. If EPA had included the Thoma and OIPA studies instead of the DOE G&B study, the EF would be 6.8 scf/hr. None of these calculations appear to be weighted based on the number of controllers tested. Consequently, for example, the 19 controllers in the GRI/EPA 1996 study are treated equally with the 128 controllers in the Prasino report. If EPA had weighted the data and used the Thoma and the OIPA studies, the EF would be closer to 3.7 scf/hr.

In addition to proposing the new EF of 8.8 scf/hr for intermittent pneumatic controllers at production sites, EPA suggested the possibility of a bifurcated calculation breaking apart malfunctioning controllers (24.1 scf/hr) and properly functioning controllers (0.3 scf/hr). The consequences of these revised EF can be seen in this table prepared by the Arkansas Independent Producers and Royalty Owners and included in its comments to the 2022 proposal. As it shows, the current GHGRP EF (13.5 scf/hr) overstates intermittent pneumatic controller methane emission by approximately 35 percent compared to the EF in this proposal (8.8 scf/hr). The disparity is far larger using the bifurcated calculation where the difference would be about 80 percent.

[See DCN EPA-HQ-OAR-2019-0424-0326-A1 for table of Comparison of Population Methane Emissions Associated with Intermittent-Bleed Pneumatic Devices as Determined by Current GHGRP "Eq. W-1" v. Proposed GHGRP Eq. W-1A v. Proposed GHGRP "Eq. W-1B."]

EPA's Technical Support Document (TSD) for the 2022 proposal fails to recognize that other quantification methods are potentially just as valid as measurements for purposes of EF development. Other methodologies with similar or better uncertainties when scaling a smaller sample up to a larger population are valid. Engineering calculations, based on volumetric measurements, pressure measurements, and measurements of actuation counts, are as good as, or better, than volumetric rates derived from devices that use mass flow meters and calibration curves. EPA's 2022 proposal TSD discounts studies that did not use "measurements" by removing them from the basis for proposed EF without explaining the technical basis for this position. Similarly, EPA should allow for reporters to consider control devices when applied to pneumatic devices in the calculation methodology similar to other sources.

These are fundamental issues that need to be addressed by EPA, not only for intermittent controllers, not only for Subpart W, but for the entire GHGRP. Over the years, the GHGRP and the GHGI have produced an oversized influence on the deliberations and understanding of greenhouse gas management analysis. Advocacy groups have taken GHGRP information and used it to suggest an accuracy well beyond what can be justified from the building block EF that were used to develop it, while at the same alleging it understates emissions. These seemingly incongruous arguments should compel EPA to engage in its own efforts to improve the accuracy of both the GHGRP and the GHGI. Instead, it merely throws other uncontrolled studies into the mix of calculating emissions with limited or nonexistent critical analysis.

Commenter Name: Douglas Jordan
Commenter Affiliation: Western Midstream Partners, LP
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0202-A1
Comment Excerpt Number: 3

Comment Excerpt: Some of the proposed rule changes we encourage, and support include: Application of new emissions factors for properly operating and malfunctioning intermittent bleed pneumatic controllers included in company leak detection and repair surveys;

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 5

Comment Excerpt: The Alliance strongly prefers reporting of the most accurate data available. To that end, we commend EPA or developing this alternative calculation methodology for intermittent bleed pneumatics. Allowing for actual monitored, empirical data to supplant emission factor-based estimates encourages regulated entities to improve their maintenance and design programs and provides an incentive for additional monitoring. For meeting EPA's goals of reducing methane, VOC, and other emissions, incentivizing additional monitoring is a strong policy choice.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 43

Comment Excerpt: We support EPA's proposed update to pneumatic device emission factors in the transmission and storage industry segments. However, we encourage EPA to seek measurement data for pneumatic devices in these industry segments. EPA notes that "if these intermittent bleed devices are subject to malfunction emissions, the intermittent bleed pneumatic device emission factor used in subpart W for the transmission and storage industry segments would not include excess emissions caused by worn or malfunctioning devices."[112] We are concerned about potential device malfunctions and encourage EPA to pursue measurement data on pneumatic devices, particularly intermittent devices, in these industry segments.

EPA is also proposing to require facilities in onshore natural gas processing to report emissions from pneumatics using the same emissions factors as transmission and storage. As EPA notes, natural gas driven controllers are far less common in the processing segment. However, in the interest of completeness, it is appropriate for EPA to include this emission source category so that operators are required to report these emissions if and when this equipment is used in this segment. We support EPA's proposed updated emissions factors for the gas processing segment.

Footnotes

[112] Subpart W TSD at p. 19.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 11

Comment Excerpt: Range appreciates EPA's reduction in the emissions factor for intermittent pneumatic devices.

EPA clarifies that its Subpart W regulations require operators to report emissions from intermittent pneumatic devices the entire time they are "in service" and not only when they are operating (*i.e.*, actuating such that emissions occur). 87 Fed. Reg. at 36963-65. At the same time, EPA is also proposing to reduce the emissions factor for intermittent pneumatic devices from 13.5 scf/hr to 8.8 scf/hr (average factor) or 0.3 scf/hr (leaker factor). Range appreciates that, along with the clarification of the reporting requirements for intermittent pneumatic devices, EPA has reduced the default emissions factor to address the problem with the current regulations requiring operators to report higher than actual emissions from intermittent pneumatic devices.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 37

Comment Excerpt: To calculate EFs for low and high bleed pneumatics, EPA directly employs EFs from their analysis of the aggregate Zimmerle et al. (2015) continuous bleed emission factor along with Subpart W data.[49] They back-calculate an effective high bleed emission factor based on the prevalence of high and low bleed devices as reported in Subpart W and our assumed low bleed device emission rate. For intermittent devices, EPA used the average intermittent bleed EF from the GRI/EPA study (1996e). This analysis is used to create new EFs for transmission and storage.

We support EPA's proposed update to pneumatic device emissions factors in the transmission and storage industry segments. However, we encourage EPA to seek measurement data for pneumatic devices in these industry segments. EPA notes that "if these intermittent bleed devices are subject to malfunction emissions, the intermittent bleed pneumatic device emission factor used in Subpart W for the transmission and storage industry segments would not include excess emissions caused by worn or malfunctioning devices."[50] We are concerned about potential device malfunctions and encourage EPA to pursue measurement data on pneumatic devices, particularly intermittent devices, in these industry segments.

Table 3. Pneumatics Emissions Factors for Transmission, Storage, and Processing

(scfh)	EPA Proposed Updated Emission Factor	Old Subpart W Emission Factor
Low Bleed	6.8	1.37
Intermittent Bleed	2.3	2.35
High Bleed	32.4	18.2

EPA is also proposing to require facilities in onshore natural gas processing to report emissions from pneumatics, using the same emissions factors as Transmission and Storage. As EPA notes, natural gas driven controllers are far less common in the Processing segment. However, in the interest of completeness, it is appropriate for EPA to include this emissions source category so that operators are required to report these emissions if and when this equipment is used in this segment. We support EPA's proposed updated emissions factors for the gas processing segment.

Footnotes

[49] See Mark de Figueiredo & Stephanie Bogle, Technical Support for Revisions and Confidentiality Determination for Data Elements Under the Greenhouse Gas Reporting Rule; Proposed Rule – Petroleum and Natural Gas Systems Docket ID No. EPA-HQ-OAR-2019-0424 (2020) at Table 2-10.
[50] Id.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 46

Comment Excerpt: We support EPA's proposal to revise the definition of variable "Tt" in Equation W–1 and the corresponding reporting requirement in 40 C.F.R. § 98.236(b)(2) to use the term "in service" (*i.e.*, supplied with natural gas) rather than "operational" or "in operation." This clarification is important because it would prohibit operators from reporting their controllers as operating for the brief moments that they emit gas. Bloomberg News reported that several companies have reported their controllers as in operation for less than ten minutes per day, leading to significant underestimates of emissions.[120] By updating this definition to "in service," EPA can close this reporting loophole and more accurately quantify emissions.

Footnotes

[120] Zachary Midler, Methane 'Loophole' Shows Risk of Gaming New US Climate Bill, Bloomberg News, Aug. 10, 2022, https://www.bloomberg.com/news/articles/2022-08- 10/methane-loophole-shows-risk-of-gaming-new-usclimate-bill.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 39

Comment Excerpt: We support EPA's proposal to revise the definition of variable "Tt" in Equation W–1 and the corresponding reporting requirement in 40 CFR 98.236(b)(2) to use the term "in service (*i.e.*, supplied with natural gas)" rather than "operational" or "in operation." This clarification is important because it would prohibit operators from reporting their controllers as operating for the brief moments that they emit gas. Bloomberg News reported that several companies have reported their controllers as in operation for less than ten minutes per day, leading to significant underestimates of emissions.[53] By updating this definition to "in service," EPA can close this reporting loophole and more accurately quantify emissions.

Footnotes

[53] Zachary Midler, Methane 'Loophole' Shows Risk of Gaming New US Climate Bill, Bloomberg News (Aug. 10, 2022), https://www.bloomberg.com/news/articles/2022-08-10/methane-loophole-shows-risk-of-gaming-new-usclimate-bill.

Commenter Name: Michael S. Land
Commenter Affiliation: Terra Energy Partners (Terra)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0207-A1
Comment Excerpt Number: 1

Comment Excerpt: Terra Supports the Proposed Inclusion of Equation W–1B.

Terra fully agrees with EPA's observation that significant differences exist in the emissions from intermittent bleed pneumatic devices functioning as intended (short, small releases during device actuation) and malfunctioning devices. We therefore agree with EPA's introduction of a new equation (Equation W–1B) for calculating vented emissions from pneumatic controllers that include a leaker factor to differentiate properly functioning devices from malfunctioning devices, as determined by surveying in accordance with part 60, subpart OOOOb or an approved state or federal plan in part 62. Terra believes that this new equation, combined with the appropriate monitoring practices, portray a much more accurate view of vented emissions, as it separates properly functioning pneumatic controllers from faulty or leaking controllers.

Indeed, Colorado has worked diligently to reduce emissions from faulty or leaking pneumatic controllers. For example, the Colorado Air Quality Control Commission (AQCC) adopted regulations in 2017 requiring that owners or operators implement pneumatic controller leak detection and repair (LDAR) requirements in areas classified as nonattainment with the National Ambient Air Quality Standards (NAAQS).[1] Specifically, the AQCC required that owners or operators inspect pneumatic controllers at well production facilities annually, semi-annually, quarterly, or monthly, depending on the facility's emissions, and promptly repair any identified leaks or malfunctions. With the passage of Colorado Senate Bill 19-181 in 2019, which mandated that Colorado achieve a 26% reduction in GHG emissions by 2025, 50% by 2030, and 90% by 2050 (from a 2005 baseline), the AQCC expanded the pneumatic controller inspection and maintenance requirements to apply state-wide.[2] The AQCC also implemented several regulations requiring that owners or operators replace or retrofit emitting pneumatic controllers

with non-emitting pneumatic controllers according to a phase out schedule.[3] Accordingly, Colorado's increased regulation of pneumatic controllers has reduced their GHG emissions and improved their performance and reliability.

Terra has also worked diligently to reduce emissions from the 34,000 emitting pneumatic controllers that it operates. For example, Terra is going above and beyond the AQCC's LDAR requirements by conducting monthly OGI inspections at all facilities with emissions equal to or greater than 2 tons per year of VOCs and voluntarily conducting approximately 940 additional OGI inspections in 2022 at facilities with less than 2 tons per year of VOC emissions, which are not required until 2023. Moreover, as noted in the introduction, Terra has implemented a program to eliminate its emitting pneumatic controllers and expects to eliminate over 8,000 this year alone. Equation W–1B will allow operators with robust LDAR programs to report much more accurate data to EPA under Subpart W, benefitting both the EPA and responsible operators. Consequently, Terra fully supports EPA's proposed inclusion of Equation W–1B for calculating vented emissions from pneumatic controllers.

Footnotes

[1] See generally, AQCC Regulation Number7, Part D, Section III.

[2] Id.

[3] See AQCC Regulation Number7, Part D, Section III.C.4.

Commenter Name: Douglas Jordan
Commenter Affiliation: Western Midstream Partners, LP
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0202-A1
Comment Excerpt Number: 5

Comment Excerpt: Some of the proposed rule elements that we oppose include the following items which are further detailed in the comments WES has endorsed (American Petroleum Institute, Gas Processors Midstream Association, and Texas Pipeline Association): Significantly higher emissions factor for continuous low-bleed pneumatic controllers.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 6

Comment Excerpt: EPA's alternative calculation methodology for intermittent bleed pneumatic devices is heavily weighted on malfunctioning devices using an EF of 24.1 standard

cubic feet per hour per device for malfunctioning devices. This approach also assumes that if a pneumatic device monitoring survey is conducted, and the device was found malfunctioning, it is assumed to have been malfunctioning since the last survey. This may overestimate emissions and does not take into account the fundamental differences in design and operation of intermittent bleed pneumatic devices and as a result may not be indicative of actual emissions.

We request EPA allow reporters the option to conduct engineering studies to determine the best emission data for their intermittent bleed pneumatic devices that account for design and operational differences and utilize the best emission data for that source or allow the collection of actual emissions. This would allow reporters to monitor emissions and make better operational or equipment changes to reduce or eliminate those emissions.

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0230-A1
Comment Excerpt Number: 5

Comment Excerpt: The current EF for intermittent pneumatic controllers is 13.5 scf/hour/component. This EF was developed [in] the mid-1990s based on data collected from 19 controllers. It is hardly an example of robust data acquisition. Since then, the validity of this EF has been consistently questioned. It has become a higher profile issue as various environmental lobbying groups have produced reports based on the Greenhouse Gas Inventory (GHGI) that is largely developed using the GHGRP. In general, EPA discusses six studies that have been done with information on intermittent pneumatic controllers for production operations (GRI/EPA 1996, Allen, Thomas, Prasino, OIPA and API 2019). Additionally, EPA assessed a Department of Energy study on gathering and boosting operations (DOE G&B). In each case EPA discusses the limitations of the studies — short sampling times with assumptions about the activation period for intermittent controllers, emissions that are calculated rather than measured, classification issues. Then, EPA eliminates two studies (Thoma, OIPA) apparently because of their use calculated emissions (which were far lower than some of the other studies).

Subsequently, it produces the following summary table:

[See DCN EPA-HQ-OAR-2019-0424-0230-A1 for Table 2-9. Comparison of Population Emission Factors for Natural Gas Pneumatic Device Venting for Production and G&B Industry Segments]

Next, EPA averages the intermittent factors for these studies to produce a new EF of 8.8 scf/hr. However, this appears to include the EF from the DOE G&B study; if it had not, the EF would appear to be 8.2 scf/hr. If EPA had included the Thoma and OIPA studies instead of the DOE G&B study, the EF would be 6.8 scf/hr. None of these calculations appear to be weighted based on the number of controllers tested. Consequently, for example, the 19 controllers in the GRI/EPA 1996 study are treated equally with the 128 controllers in the Prasino report.

In addition to proposing the new EF of 8.8 scf/hr for intermittent pneumatic controllers at production sites, EPA suggests the possibility of a bifurcated calculation breaking apart malfunctioning controllers (24.1 scf/hr) and properly functioning controllers (0.3 scf/hr).

The consequences of these revised EF can be seen in this table prepared by the Arkansas Independent Producers and Royalty Owners and included in its comments. As it shows, the current GHGRP EF (13.5 scf/hr) overstates intermittent pneumatic controller methane emission by approximately 35 percent compared to the EF in this proposal (8.8 scf/hr). The disparity is far larger using the bifurcated calculation where the difference would be about 80 percent.

[See DCN EPA-HQ-OAR-2019-0230-A1 for table insert, page 3, Comparison of Methane Emissions Associated with Intermittent-Bleed Pneumatic Devices as Determined by Current GHGRP "Eq. W-1" v. Proposed GHGRP "Eq. W-1A" v. Proposed GHGRP "Eq. W-1B"].

While these various approaches try to address the uncertainties of the emissions estimating process, they fail to address the underlying reality that EPA must now address. EPA must conduct a robust and accurate analysis of the components of Subpart W. It must be a study that addresses all the shortcomings of the prior studies and produces results that can meet the demands of accuracy that will be necessary for the methane tax. Rather than wasting time concluding these EF modifications, EPA should devote its efforts to a robust revision of all of the Subpart W EF — to develop the necessary studies and execute them. It must also include a structure to allow and sanction alternative calculations that can be used.

Commenter Name: Colin McKee
Commenter Affiliation: Petroleum Association of Wyoming (PAW)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0232-A1
Comment Excerpt Number: 2

Comment Excerpt: For many of the emission controls devices required to report under the GHGRP, the EPA has assigned an emission factor to be used to estimate emissions. The EPA has based these emissions factors on recent studies, analyzing potential emission rates for properly working equipment, malfunctioning equipment and under many other scenarios. This does provide operators a consistent and streamlined process to develop their emission data. However, some of the emissions rates the EPA is proposing to use are not reflective of actual field data.

For example, the average factor for intermittent bleed pneumatic controllers is inflated. The EPA assumes a population controllers has an average leak rate of 8.8 scfh, where some of those devices are malfunctioning (emitting 24.1 scfh) and some of those devices are properly functioning (emitting 0.3 scfh). This assumes that for the period analyzed, 35.8% of those devices are malfunctioning. This leak percentage does not match data and the EPA did not properly support this finding. Analyzing current data in the GHGRP, malfunction rates appear closer to a 2-3%. This would imply an overall average leak rate of 1.49 scfh. PAW encourages EPA to evaluate these data sets available within the GHGRP, information reported through OOOO and state reporting mechanisms to calculate reasonable and accurate malfunction rates.

Getting this information right better ensures accurate data is reported and punitive fees are not assessed through the IRA methane fee.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 4

Comment Excerpt: Western Energy Alliance supports the reduction of the intermittent bleed pneumatic device factor, as data provided in studies to EPA have consistently shown the previous GHGRP emission factor was far too high.[1,2] However, while the incremental reduction is welcome, the average value for intermittent bleed pneumatics is still much higher than studies indicate. EPA appears to recognize this in its alternative method for calculating emissions for pneumatic devices. In the alternative method, devices that are found to be operating properly will use an emission factor of 0.3 standard cubic feet per hour (scfh), and devices that are found to be malfunctioning will use an emission factor of 24.1 scfh for the period of their malfunction.

These emission factors for both properly functioning and malfunctioning devices represent a more accurate estimate for those devices. However, assuming these factors are correct, the average factor for unmonitored devices is still inflated. If a population of intermittent bleed devices is assumed to have an average leak rate of 8.8 scfh, where some of those devices are malfunctioning (and emitting 24.1 scfh), and some of those devices are properly functioning (emitting 0.3 scfh), this assumes that for the period analyzed 35.8% of those devices are malfunctioning.[3] This leak percentage does not match data identified either in studies referenced by EPA or in data reported to states.

For example, in the state of Colorado, there are approximately 120,000 gas-driven pneumatic controllers reported in the state's Emissions Intensity reporting program, (this data is matched well by EPA's data in the GHGRP); however, operators in Colorado report on pneumatic devices found to be malfunctioning. In the 2020 summary report for Colorado, which includes reporting from more than 135 reporting entities, only 3,198 of those devices were found to be malfunctioning. Given the state of Colorado's extensive leak detection requirements, and the fact that 2,129 of those controllers identified as malfunctioning were found during monthly inspections, and therefore were returned to proper service, the malfunction rate assumed from those values is closer to a 2-3%. Even with an overly conservative assumption for those controllers that are not measured, assuming a malfunction rate of 5% implies an overall average leak rate of 1.49 scfh.[4]

EPA needs to use an average factor of less than 2 scfh, or alternatively, provide data to support the implied malfunction rate of 35.8% that the current average leak rate estimate implies. Western Energy Alliance recommends EPA evaluate the broad data sets available within the GHGRP, OOOO, and state reporting mechanisms to calculate a reasonable malfunction rate and

use that reasonable malfunction rate in combination with its currently developed factors for malfunctioning and properly functioning devices to devise an improved average factor.

Footnotes

[1] Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Pneumatic Controllers, David T. Allen, Adam P. Pacsi, David W. Sullivan, Daniel Zavala-Araiza, Matthew Harrison, Kindal Keen, Matthew P. Fraser, A. Daniel Hill, Robert F. Sawyer, and John H. Seinfeld/ Environmental Science & Technology 2015 49 (1), 633-640

[2] Oklahoma Independent Petroleum Association, Pneumatic Controller Emissions from a Sample of 172 Production Facilities, November 2014. Available online: http://vibe.cira.colostate.edu/ogec/docs/Oklahoma/1418911081.pdf

[3] 35.8% x 24.1 + 64.2% x 0.3 =8.8

[4] 5% x 24.1 + 95% x 0.3 = 1.49

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 9

Comment Excerpt: EPA is proposing a population emissions factor of 6.8 scf/hour/component for low bleed pneumatic devices which is inconsistent with the definition for the same type of device, which includes a vent rate of less than 6 scf/hr. AIPRO recommends that the agency align the population emission factor with the current definition. Further, AIPRO recommends an alternative calculation methodology whereby reporters can determine actual vent rates for low-bleed (and all other types of pneumatics) via approved quantification method(s) (*i.e.*, High-Flow Sampler) in lieu of using one-size fits all emissions factors.

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 3

Comment Excerpt: PBPA supports the reduction of the intermittent bleed pneumatic device factor, however, while the incremental reduction is welcome, the average value for intermittent bleed pneumatics is still much higher than studies indicate it should be. EPA seems to recognize this in its alternative method for calculating emissions for pneumatic devices that are surveyed, however, such justification is not detailed in the proposed revisions. In the alternative method, devices that are surveyed and found to be properly operating can use an emission factor of 0.3

scfh, and devices that are surveyed and found to be malfunctioning are to use an emission factor of 24.1 scfh for the period of their malfunction. Assuming these factors are correct, even with the incremental reduction, PBPA believes the average factor for un-surveyed devices is still inflated. If a population of intermittent bleed devices is assumed to have an average leak rate of 8.8 scfh, where some of those devices are malfunctioning (and emitting 24.1 scfh), and some of those devices are properly functioning (emitting 0.3 scfh), this assumes that for the period analyzed about a third of those devices are malfunctioning. This leak percentage does not match data identified in studies referenced by EPA.

EPA should use a lower average factor based on a more realistic malfunction rate, or alternatively, provide data to support the implied malfunction rate of about a third of controllers that the current average leak rate estimate apparently assumes. PBPA encourages EPA to evaluate the data available from the GHGRP and OOOO, and relevant State programs to determine a realistic malfunction rate for use with its currently developed factors for properly functioning and malfunctioning pneumatic devices to develop a more realistic average emission factor for non-surveyed devices. Further, since EPA is allowing for use of much lower emission factors for controllers that are "surveyed," EPA should clarify whether or not this only applies to controllers that are at facilities subject to OOOO OGI LDAR requirements, or subject to voluntary or State LDAR programs.

Regarding low-bleed gas pneumatic devices, as stated in the Technical Support Document for this proposal, the definition for a low-bleed gas pneumatic device is <6 scf/hr per 40 CFR part 60 subpart OOOOa. Based on several studies and assumptions from those studies, EPA is proposing increasing the emission factor for low bleeds from the current 1.37 scf/hr to 6.8 scf/hr, which is above the current threshold for a low bleed as defined by OOOOa. However, the most recent study (API Field Study, Tupper, 2019) determined an emission rate for low-bleed devices of 2.6 scf/hr. This is the study that EPA relies on for the proposed emission factors for properly functioning and malfunctioning intermittent devices, based on OGI monitoring results, discussed above. So PBPA recommends relying on the API Field Study for low bleed devices as well, to potentially increase their emission factor to 2.6 scf/hr, which is more aligned with the current factor of 1.37 and well below the defined threshold of 6 scf/hr for low-bleed devices.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 3

Comment Excerpt: With regard to the proposed changes to the emission rate of low bleed gas-driven pneumatic devices in 40 CFR § 98.233 Table W–1A, the Marcellus Shale Coalition requests that the factor be changed to 6.0 scf/hr to be consistent with the definition of low bleed pneumatic device in 40 CFR § 98.6.

The MSC requests the ability to use manufacturer-published emission factors, if available, instead of EPA-provided emission factors for pneumatic devices. This option would incentivize the selection of lower-emitting devices when purchasing and designing facilities or retrofit projects. For example, the Norriseal Envirosave is an intermittent controller that has a published emission rate much smaller than the EPA factor. Additionally, the MSC requests the ability to apply reductions to pneumatic device emissions based on controls such as routing device vents to fuel gas, flares, vapor recovery, etc.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 8

Comment Excerpt: The Industry Trades support efforts by EPA to update its approach to quantifying emissions from pneumatic devices used throughout the oil and gas value chain based on empirical data. We request that EPA provide more information on the five-fold increase to the continuous low-bleed device emission factor. Specifically, we would like to evaluate whether the new emission factor accurately reflects recent studies especially since it is greater than the threshold that had been applied to determine whether a device should be categorized as low-bleed or high-bleed. We agree that revisions to the emission factor for low-bleed pneumatic devices is appropriate, recognizing that the API Field Study also found average emission factors higher than previously included in the reporting program, as noted in the TSD for Subpart W. However, we find that the election of a 6.8 scf/hr/device whole gas emission factor for low-bleed pneumatic devices is poorly explained and could lead to additional confusion among operators. We request that EPA provide more information on how the 6.8 scf/hr/device emission factor was generated. Further, as noted in the TSD-W, 6 scf/hr/device has been identified as the determining threshold between identifying a continuous bleed pneumatic device as either a low-bleed (under 6 scf/hr) or high-bleed (over 6 scf/hr). The 6.8 scf/hr/device whole gas emission factor elected by EPA for this revision could lead to significant confusion among operators seeking to define a device as either low- or high-bleed. In addition to providing more information regarding the election of the 6.8 scf/hr/device emission factor for low-bleed pneumatic devices, EPA should provide additional information for operators to use to define a device as either low- or high-bleed.

The Industry Trades support using two different intermittent bleed device emission factors: one for properly functioning intermittent bleed devices and one for any malfunctioning intermittent bleed devices, based on findings of the API Field Study.[4] The advantage of this bifurcated emission factor approach is that it would provide different emission estimates for facilities with the same number of intermittent bleed natural gas pneumatic devices but with significantly different ages or maintenance practices for their pneumatic devices, and it will enable documenting emission reductions achieved from a monitoring and repair program for intermittent bleed pneumatic devices.

Footnotes

[4] (Tupper, 2019).

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 7

Comment Excerpt: The Alliance urges EPA to re-evaluate the emission factor identified for low-bleed pneumatics in the proposed rule or allow for a monitoring-based alternative for malfunctioning and properly functioning devices similar to what has been proposed for intermittent bleed devices. The current factor in the proposal, 6.8 scfh, is nearly 12% higher than the definitional maximum value for low-bleed pneumatics used by EPA of 6 scfh. Any device that emits more is classified as a high bleed pneumatic device. This means that the data EPA used to develop this factor either includes a significant number of malfunctioning devices or includes device information from high-bleed pneumatic devices. If the 6.8 scfh value proposed by EPA is based on an assumed population of malfunctioning devices, EPA must allow for a monitoring-based calculation similar to what has been proposed for intermittent devices. If the average value included data from high-bleed pneumatics, that data must be removed. The Alliance recommends EPA revert to the previous emission factor for low bleed devices of 1.39 scfh. This value more accurately represents the emissions data measured in field studies and, absent additional information or justification to set an emission factor higher than the definition for that equipment category, EPA should not make a change.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA proposes requiring reporting of emissions from low bleed pneumatic devices at levels higher than EPA allows from regulated low bleed pneumatic devices.

1. EPA proposes revising the emission factor used for continuous low bleed pneumatic device vents under Subpart W of Part 98. 87 Fed. Reg. at 37100. The emissions factors are intended to provide an estimate of the amount of natural gas that a particular type of pneumatic device releases, in this case, in the unit of standard cubic feet per hour (scf/hr). EPA proposes increasing the current emissions factor for continuous low bleed

pneumatic devices from 1.39 scf/hr to 6.8 scf/hr—nearly five times the current emissions rate.

2. Specifically, Table W–1A to Subpart W establishes these "Default Whole Gas Emission Factors for Onshore Petroleum and Natural Gas Production Facilities and Onshore Petroleum and Natural Gas Gathering and Boosting Facilities." The table provides emissions factors that the natural gas industry is required to use in reporting the amount of gas that is emitted from a particular type of device, including low, high, and intermittent bleed pneumatic devices. Currently, Table W–1A contains an emissions factor of 1.39 scf/hr for continuous low bleed pneumatic devices. 40 C.F.R. Part 98, Subpart W, Table W–1A.
3. EPA's proposed rate of 6.8 scf is inconsistent with the very definition of "low-bleed pneumatic devices" in Part 98, which defines "low-bleed pneumatic devices" as:

"[A]utomated flow control devices powered by pressurized natural gas and used for maintaining a process condition such as liquid level, pressure, delta-pressure and temperature. Part of the gas power stream that is regulated by the process condition flows to a valve actuator controller where it vents continuously (bleeds) to the atmosphere at a rate equal to or less than six standard cubic feet per hour." 40 C.F.R. § 98.6 (emphasis added).

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 5

Comment Excerpt: The New Source Performance Standards applicable to the natural gas sector provide that pneumatic controller facilities must have a bleed rate equal to or less than 6 scf/hr. Specifically, Subpart OOOO of Part 60 provides:

"Each pneumatic controller affected facility constructed, modified or reconstructed on or after October 15, 2013, at a location between the wellhead and a natural gas processing plant or the point of custody transfer to an oil pipeline must have a bleed rate less than or equal to 6 standard cubic feet per hour." 40 C.F.R. § 60.5390(c)(1) (emphasis added).

Consistent with this NSPS definition, Subpart OOOOa provides:

"Each pneumatic controller affected facility at a location other than at a natural gas processing plant must have a bleed rate less than or equal to 6 standard cubic feet per hour." 40 C.F.R. § 60.5390a(c)(1) (emphasis added).

As a result, EPA is proposing to require operators to report an emissions factor for low bleed pneumatic controllers that is higher than EPA has previously established as achievable and even allowable for low bleed devices. While EPA is instructing operators that only devices that emit up to 6.0 scf/hr may be classified as low bleed, it is also instructing operators to report the

emissions from these devices as 6.8 scf/hr. This forces operators to report higher than actual emissions and creates an illogical inconsistency in regulatory obligations. More importantly, it will require industry to report a volume of emissions that is higher than the actual emissions of the device. Rather than reporting emissions based on an inaccurate default emissions factor, EPA should incentivize operators to achieve greater emissions reductions, and, thus, lower reportable emissions.

Moreover, this inconsistency exemplifies the unreliable nature of the Technical Support that EPA relied upon to develop the new emissions factor for low bleed devices. Indeed, the Technical Support is based on studies performed in different areas of the county at facilities using different types of emissions control systems but fails to acknowledge or identify how these differences impact emissions factors. Indeed, the systems Range employs in capturing emissions in Appalachia will result in different emissions than those at another operator's facility which typically vary from basin to basin. Rather than rely on a "one-size fits all" emissions factor, EPA should give operators the flexibility to develop emissions factors that more accurately reflect the emissions at their facilities and incentivize opportunities for emissions reductions.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA needs to consider the interaction that the GHGRP rulemaking has with the upcoming changes to the OOOO suite of rules. The proposed rule changes certain factors around pneumatic controllers, that will obviate some of the changes proposed in the OOOO rulemaking. The OOOO publication from November 2021 envisions a potential rulemaking provision mandating the replacement of all gas-driven pneumatic controllers at certain facilities, but the GHGRP rulemaking significantly reduces the overall emissions from those controllers. As discussed later in these comments, the reduction in the factor for pneumatic controllers is an improvement, but EPA needs to coordinate internally to ensure that after these changes become effective, retrofits and replacements of gas driven pneumatics are still the most effective way to reduce emissions from those facilities.

EPA needs to collect data from the GHGRP around malfunction rates for intermittent bleed controllers in order to re-evaluate if replacement of those controllers is warranted. In many cases, the most effective way to replace those controllers is with instrument air compressors which have associated carbon dioxide emissions. If the factor is correct, and an operator's maintenance program proves that it can limit malfunction, it will be more responsible from an overall emissions standpoint to keep intermittent bleed devices over mandating their replacement.

Emissions data from the GHGRP maybe used to inform the above-mentioned rulemaking actions currently underway, namely, ESG reporting at the SEC, the IRA's methane emissions fee, and EPA's suite of OOOO rules (OOOOa/b/c). In order to ensure consistency with these efforts, the

Alliance recommends EPA delay finalization of the proposed rule to allow for collaboration and coordination, both internally and with other agencies. Delaying finalization of the proposed rule will also serve to avoid wasting the time and resources to make additional changes to the GHGRP at a later date to correct inconsistencies among these rules.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 14

Comment Excerpt: EPA is proposing revisions to emission factors for pneumatic devices in the G&B segment. GPA supports using recent studies to update these emission factors and believes an update is necessary to ensure emission estimates better align with actual emissions. In the Technical Support Document Table 2-11, EPA presents these proposed emission factors, along with alternative emission factors developed by excluding zero emissions measurements from the studies used to develop the factors. GPA supports using the data from the studies, inclusive of the zero emissions values, and therefore recommends that EPA adopt the emission factors presented in Table 2-11 and not adopt the alternative emission factors. It would not be appropriate to exclude valid data points simply because they indicated zero emissions.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 42

Comment Excerpt: EPA's proposed updated emissions factors based on more recent measurement data are an improvement from existing factors, but may not fully account for the duration of malfunctions due to the short measurement periods in the underlying studies. EPA's updated factors are much higher for low-bleed devices, slightly lower for intermittent-bleed devices, and fairly comparable for high-bleed devices (see comparison tables below). Because of our concerns about the short measurement periods used to support the proposed emission factors, we recommend that EPA instead adopt emission factors based on the DOE G&B Study, which we believe more accurately represents emissions from pneumatic devices.

In order to create new emission factors for the production and gathering and boosting segments, EPA averages data from six studies (Table 2-9): GRI/EPA (1996), Allen et al. (2015), Prasino Group (2013), DOE G&B Study (2019) (also known as Zimmerle et al./Luck et al.), and API Field Study (2019) (also known as Tupper et al.). EPA also proposes alternative emission

factors, which are displayed in parentheses in the table below. EPA notes that they calculated alternative emissions factors for production and gathering and boosting due to "uncertainty related to short measurement periods during the Allen et al. (2015) study and potential bias of devices with zero emissions for intermittent bleed devices and with the representativeness of Prasino Group (2013a) measurements for the US." We agree with EPA's assessment of the short measurement period's bias towards low emissions; a fifteen minute measurement would fail to accurately assess emissions from an actuation, and thus underestimate emissions from the device.

However, these concerns about short measurement periods also apply to the API Field Study—this study used a sample period of approximately fifteen minutes. In contrast, the DOE G&B Study conducted measurements that lasted approximately three days. To our knowledge, this is the only study that has measured emissions for this length of time. This is important because a fifteen minute measurement period can result in a significant measurement error.[108] Luck et al. analyzed the pneumatic controller data collected as part of the DOE G&B Study. It conducted a Monte Carlo analysis to determine how large the measurement error would be if one were to observe the pneumatic controller for fifteen minutes rather than three days. It determined that: "For the mix of [pneumatic controllers] measured here, the average expected absolute error of a 15 min measurement is 49% [31—71%]. If the measurement duration is extended to 24 h, the expected absolute measurement error is reduced to 20% [11—31%]."[109] Therefore, we do not recommend that EPA base emission factors on studies that used a fifteen minute (or less) measurement period. The figure below shows the simulated measurement error from each pneumatic controller in Luck's analysis; the mean error for all 61 controllers is shown as the overlaid red line.

[See DCN EPA-HQ-OAR-2019-0424-0241-A1, p.33 for Figure 3: Luck et al. Simulated Measurement Error]

Due to this potential for error, we recommend that EPA update emission factors based on the results of the DOE G&B Study, rather than averaging emission factors from studies of varying qualities. While the DOE G&B Study focused on gathering and boosting stations, we believe it is appropriate to apply these emission factors to the production segment as well. EPA has historically used the pneumatic emission factors from the production segment for gathering and boosting as well, and we believe it is appropriate to continue doing so here.

(scfh)	CATF/EDF Proposed Updated Emission Factor	EPA Proposed Updated Emission Factor	Old Subpart W Emission Factor
Low Bleed	7.6	6.8 (or 7.6)	1.39
Intermittent Bleed	11.1	8.8 (or 10.3)	13.5
High Bleed	19.3	21.2 (or 23.7)	37.3

We note that the API Field Measurement Study (Tupper et al. 2019), which was presented at the 2019 EPA Stakeholder Workshop on Oil and Gas, has not been peer-reviewed and the full dataset is not publicly available. In contrast, the DOE G&B Study includes peer-reviewed articles (including Zimmerle et al. 2019, Luck et al. 2019, and Vaughn et al. 2021) for which all

data is publicly available.[110] It is impossible for stakeholders to critique the methodology or conclusions of the API Field Measurement Study without access to transparent and granular data.

Footnotes

[108] Benjamin Luck et al., Multiday Measurements of Pneumatic Controller Emissions Reveal the Frequency of Abnormal Emissions Behavior at Natural Gas Gathering Stations, 52 Env. Sci. Technol. Letters 348 (2019), https://pubs.acs.org/doi/10.102 1/acs.estlett.9b00158 (analyzing pneumatic data collected in DOE G&B study).

[109] Id.

[110] Colorado State University, Data - Characterization of Methane Emissions from Gathering Compressor Stations, https://mountainscholar.org/handle/10217/195489.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 45

Comment Excerpt: EPA proposes an alternate methodology for remaining intermittent bleed pneumatic devices based on the results of inspections. This methodology employs emission factors from a 2019 API Field Measurement Study, which as described above, we have not been able to fully evaluate. We have significant concerns about EPA's proposed alternative methodology for intermittent bleed pneumatic devices based on the results of inspections. For intermittent bleed pneumatic devices, EPA has proposed an alternative methodology that requires monitoring surveys and applies a bifurcated emissions factor approach. Operators would survey their pneumatic devices and calculate emissions using Tupper et al.'s emissions factors for properly functioning and malfunctioning devices.

While such an approach could lead to more granular data on whether controllers are malfunctioning or not, we are concerned that OGI surveys may not accurately characterize emissions from malfunctioning controllers. EPA believes this approach could incentivize operators to look at their controllers during the OGI survey (as should be required), because they would be able to use a lower emission factor if the controller is determined to be functioning properly. EPA also believes it would help the agency to track emissions increases or decreases tied to malfunctions. However, as we describe below, there are serious flaws with this bifurcated approach. Due to these flaws, we recommend that EPA not finalize this "leaker" approach for intermittent bleed pneumatic controllers.

As EPA notes, Tupper et al. found that approximately 38% of intermittent controllers (99 out of 263) were malfunctioning. The Tupper study made most of its measurements at well production and gathering and boosting sites using a GHD recording high volume sampler with about 0.5 Hz recording, with measurements lasting approximately 15 minutes each. As discussed above, the DOE G&B study found that 15 minutes is not sufficient time to determine whether a controller is

malfunctioning. The DOE study, using observation times much longer than 15 minutes, found a malfunction rate of 63% for intermittent controllers. Therefore, the results in Tupper are an underestimate of the actual percent of intermittent controllers that are likely to be malfunctioning. Using a less sensitive monitoring technology (OGI) over an even shorter time period than 15 minutes, will result in identifying an even lower number of malfunctioning controllers.

Luck et al. extensively measured emissions from 72 controllers at 16 natural gas compressor stations, recording consumption of gas by the controllers for multi-day periods. They found that a very large portion of controllers were abnormally operating, leading to emissions substantially higher than emissions from normal operating controllers. Of the overall pool of controllers, 42% were operating abnormally. Of the 40 intermittent controllers they studied, 25 (63%) were operating abnormally.[113]

While the total number of controllers measured is lower in Luck than in Tupper, the Luck study measured each controller for approximately three days (as opposed to fifteen minutes in Tupper). In many cases, the controller appeared to be operating properly in the first fifteen minutes, but later on in the three day period, a malfunction occurred. The Luck study used four criteria for determining whether an intermittent bleed controller was malfunctioning:

1. Continuous Emissions: Emissions recording of an intermittent vent PC that does not show control actuations and emits gas continuously
2. Extended Ramp: PC shows an emission ramp longer than three minutes in duration leading up to an actuation event
3. Does Not Return to Zero: PC shows control actuations but emission rates do not return to zero between actuation events
4. Irregular Behavior: Intermittent vent PC shows some combination of the previous three behaviors or generally irregular emissions patterns.

If the emissions trace for an intermittent vent device met any of these criteria, the controller was identified as abnormally operating. Luck then conducted a Monte Carlo analysis to determine how large the measurement error would be if one were to observe the pneumatic controller for fifteen minutes rather than three days.[114] This Monte Carlo analysis included all the controllers in their sample, both continuous and intermittent bleed, and it looked at the actual emissions rate measured rather than simply the determination of functioning versus malfunctioning.

In order to separate out results for intermittent controllers and to distinguish between functioning and malfunctioning controllers, Clean Air Task Force did an independent review of the supporting information published alongside the Luck study. The review found that 10 of the 25 malfunctioning intermittent controllers were malfunctioning from the beginning of measurement, and the other 25 were determined to be malfunctioning based on observations after the first hour of measurement.[115] This means that if Luck had only taken measurements for 15 minutes, as Tupper did, it would have found only 10 out of 40 intermittent bleed controllers malfunctioning, a 25% malfunction rate.

In 2018, the Colorado Pneumatic Controller Task Force (PCTF) conducted a field study examining the operation of these devices in Colorado's non-attainment area (NAA). The findings

are described in a 2020 report to the Colorado Air Quality Control Commission.[116] One of the goals of this study was to document malfunction rates and causes for controllers that would be found using the state's "find and fix" program. In this program, operators are required to observe pneumatic controllers during their already required instrument-based leak detection and repair surveys, and fix any controller found to be malfunctioning. The study found that 5.6% of the inspected intermittent controllers were operating improperly, far lower than the malfunction rate in either Tupper or Luck.[117] We believe this divergence is likely attributable to short observation times used during OGI inspections.

Stovern et al. also studied pneumatic controllers in the Denver-Julesberg basin in 2018.[118] This study directly observed that 11.3% of the intermittent controllers were emitting continuously, due to a maintenance issue. However, the study notes that due to methodological issues, this 11.3% figure is probably an underestimate of the actual rate of malfunction among the intermittent controllers they inspected. They estimate that the true rate of malfunction in their sample was 11.6 — 13.6%, again far lower than the malfunction rate in either Tupper or Luck [119] The Stovern study was also based on OGI camera inspections of pneumatic controllers, and was designed to be a "snap shot in time" to determine whether an intermittent controller was malfunctioning.

The PCTF report and the Stovern study suggest that the range in the percent of intermittent controllers likely to be found malfunctioning using a snapshot OGI survey is well below the average presented in the Tupper paper, which EPA seeks to rely on. And in turn, the Tupper estimate for the percent of intermittent bleed controllers that are malfunctioning is lower than the actual malfunction rate found in the longer survey period used in the Luck study. Thus, if EPA were to adopt this approach, it would result in a significant underestimate of emissions from intermittent bleed pneumatic controllers. We therefore recommend that EPA does not adopt this alternative approach.

Finally, we note that the waste charge contained in MERP may incentivize underreporting in order to stay below the charge thresholds. This cost could lead some operators to choose the proposed alternative approach in order to minimize reported emissions from malfunctioning controllers in a manner that is likely inconsistent with actual observed emissions. This, in conjunction with the short observation periods of OGI inspections, should be considered by EPA, and we believe weigh against finalizing the alternative approach.

Footnotes

[113] Benjamin Luck et al., supra note 108.

[114] Id. at Figure 2.

[115] Benjamin Luck et al., Methane emissions from gathering and boosting compressor stations in the U.S. Supporting volume I: Multi-day measurements of pneumatic controller emissions, SI-7 Meter Recording, https://mountainscholar.org/handle/10217/194543.

[116] Pneumatic Controller Task Force Report to the Air Quality Control Commission, Colo. Air Pollution Control Div., 12 (June 1, 2020), https://drive.google.com/file/d/1JStgsOSD2NvZITht1Ti8QQnJAmUZxKgsn/Vview.

[117] Id.

[118] Michael Stovern et al., Understanding Oil and Gas Pneumatic Controllers in Denver-Julesburg Basin Using Optical Gas Imaging, 70 J. of the Air & Waste Management Assoc., 9 (2020), https://doi.org/10.1080/10962247.2020.1735576.
[119] Id.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 12

Comment Excerpt: EPA is proposing updated emissions factors based on more recent measurement data; these factors are much higher for low bleed controllers, slightly lower for intermittent bleed controllers, and fairly comparable for high-bleed controllers.

In order to create new emission factors for the production and gathering and boosting segments, EPA averages data from six studies (Table 2-9): GRI/EPA (1996), Allen et al (2015), Prasino Group (2013), DOE G&B Study (2019) (also known as Zimmerle et al/Luck et al), and API Field Study (2019) (also known as Tupper et al). Further, they propose alternative emission factors (seen in parentheses in the table below). EPA notes that they calculated alternate emissions factors for production and gathering and boosting due to "uncertainty related to short measurement periods during the Allen et al. (2015) and potential bias of devices with zero emissions for intermittent bleed devices and with the representativeness of Prasino Group (2013a) measurements for the US." We agree with EPA's assessment of the short measurement period's bias towards low emissions; a 15-minute measurement would fail to accurately assess emissions from an actuation, and thus underestimate emissions from the controller.

However, these concerns about short measurement periods also apply to the API Field Study– this study used a sample period of approximately 15 minutes. In contrast, the DOE G&B Study conducted measurements that lasted approximately 3 days. To our knowledge, this is the only study that has measured emissions for this length of time. This is important because a shorter measurement period can result in a significant measurement error.

Luck et al. present analysis of the measurements done in the DOE G&B study. They measured emissions from 72 controllers at 16 natural gas compressor stations, recording consumption of gas by the controllers for multi-day periods. They found that a very large portion of controllers were abnormally operating, leading to emissions substantially higher than emissions from normal operating controllers. Of the overall pool of controllers, 42% were operating abnormally. Of the 40 intermittent controllers they studied, 25 (63%) were operating abnormally.[45]

While the total number of controllers measured is lower in Luck than in Tupper, the Luck study measured each controller for approximately 3 days (as opposed to 15 minutes in Tupper). In many cases, the controller appeared to be operating properly in the first 15 minutes, but later on in the 3 day period, a malfunction occurred. Luck defines its criteria for determining whether an intermittent bleed controller is malfunctioning as the following:

"Four criteria were assigned to classify intermittent vent controllers as normally or abnormally operating. If the emissions trace for an intermittent vent device was observed to violate any of these criteria, the controller was identified as abnormally operating.

- Continuous Emissions: Emissions recording of an intermittent vent PC that does not show control actuations and emits gas continuously
- Extended Ramp: PC shows an emission ramp longer than three minutes in duration leading up to an actuation event
- Does Not Return to Zero: PC shows control actuations but emission rates do not return to zero between actuation events
- Irregular Behavior: Intermittent vent PC shows some combination of the previous three behaviors or generally irregular emissions patterns."

Luck conducted a Monte Carlo analysis to determine how large the measurement error would be if one were to observe the pneumatic controller for 15 minutes rather than 3 days.[46] "For the mix of [pneumatic controllers] measured here, the average expected absolute error of a 15 min measurement is 49% [31−71%]. If the measurement duration is extended to 24 h, the expected absolute measurement error is reduced to 20% [11−31%]." This Monte Carlo analysis included all the controllers in their sample, both continuous and intermittent bleed, and it analyzed the actual measured emissions rate rather than simply the determination of functioning vs. malfunctioning.

[See DCN EPA-HQ-OAR-2019-0424-0248-A1, pg. 18 for Figure 3: Simulated measurement errors of the 61 PC emission recordings with durations of >= 68h]

In order to separate out results for intermittent controllers and to distinguish between functioning and malfunctioning controllers, CATF did an independent review of the Supporting Information published alongside the Luck study. We determined that 10 of the 25 malfunctioning intermittent controllers were malfunctioning from the beginning of measurement, and the other 15 were determined to be malfunctioning based on observations after the first hour of measurement.

This means that if they had only taken measurements for 15 minutes, as Tupper did, they would have found only 10 of 40 intermittent bleed controllers malfunctioning, a 25% malfunction rate. Therefore, it is clearly inappropriate for EPA to base emission factors on studies that used a 15-minute (or less) measurement period. Due to this potential for error, we recommend that EPA update emission factors based on the results of the DOE G&B Study, rather than averaging emission factors from studies of varying qualities.

Table 2. Pneumatics Emissions Factors for Production and G&B

(scfh)	CATF/EDF Proposed Updated Emission Factor	EPA Proposed Updated Emission Factor	Old Subpart W Emission Factor
Low Bleed	7.6	6.8 (or 7.6)	1.39
Intermittent Bleed	11.1	8.8 (or 10.3)	13.5

High Bleed	19.3	21.2 (or 23.7)	37.3

The DOE G&B Study focused on G&B stations, but it is appropriate to apply these emission factors to the production segment as well. Ever since G&B was added to the GHGRP in 2016, the pneumatic emission factors were the same as those for the production segment. And, in the current proposal, EPA considers these two segments together, without any indication that emission factors diverge between the two segments. Therefore, it is appropriate to use the emission factors from the highest quality study (DOE G&B Study) and apply these factors to both the production and G&B segments. EPA should exercise caution in relying on the API Field Study (Tupper, 2019) in setting emissions factors, as this study has not been peer-reviewed and the underlying data supporting its conclusion is not publicly available. Rather, the only publicly-available information on the study comes from an 11-slide presentation that was presented at the 2019 EPA Stakeholder Workshop on Oil and Gas. In contrast, for the DOE G&B Study (including Zimmerle, 2019, Luck, 2019, and Vaughn, 2021), all data is made publicly available.[48] It is impossible to critique the methodology or conclusions of Tupper et al. without transparent and granular data. Peer review is preferable, but it is not always possible. However, it should always be possible to make data supporting emissions factor determinations available in a granular and transparent manner. EPA should use a high bar when evaluating data quality and validity used to establish emission factors, and we therefore caution against EPA's use of this study.

Footnotes

[45] Benjamin Luck et al., Multiday Measurements of Pneumatic Controller Emissions Reveal the Frequency of Abnormal Emissions Behavior at Natural Gas Gathering Stations, 6 Env't Sci. Tech. Letters 348 (2019).

[46] Id.

[47] Benjamin Luck et al., Methane Emissions from Gathering and Boosting Compressor Station in the U.S. Supporting Volume 1: Multi-Day Measurements of Pneumatic Controller Emissions, Co. State Univ. (2019), https://mountainscholar.org/handle/10217/194543.

[48] Colorado State University, Data – Characterization of Methane Emissions from Gathering Compressor Stations (last visited Oct. 4, 2022), https://mountainscholar.org/handle/10217/195489.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 38

Comment Excerpt: EPA proposes an alternate methodology for remaining intermittent bleed pneumatics based on the results of inspections. This methodology employs EFs from a 2019 API Field Measurement Study. EPA's proposed alternative methodology for intermittent bleed pneumatic controllers would produce a large underestimate of emissions, and we urge EPA not to adopt this alternative methodology. As EPA notes in its proposal, they envision very few

natural gas pneumatics upon implementation of OOOOb and OOOOc. For the few intermittent bleed pneumatic controllers that remain, EPA has proposed an alternative methodology that requires monitoring surveys using OGI cameras, as those rules would require, and applies a bifurcated emissions factor approach. Operators would survey their pneumatic devices and calculate emissions using Tupper et al.'s emissions factors for properly functioning and malfunctioning controllers.

We understand why EPA has pursued this approach. It would be good to have more granular data on controllers operating properly and those that are malfunctioning which might allow EPA to track emissions going down as increased monitoring (hopefully) makes the overall malfunction rate decline. However, as we describe and document below, there are serious flaws with this bifurcated approach. Most importantly, there is no appropriate emissions factor for malfunctioning intermittent pneumatic controllers detectable using OGI, which, due to its lack of sensitivity for lower emission rates, finds a far lower portion of malfunctioning controllers than were found by Tupper et al. and other studies which used more involved methods to study the emissions of intermittent controllers. Since the Tupper et al emissions factor for malfunctioning controllers includes all controllers that were determined to be malfunctioning using the more sensitive high-volume sampler, it includes emissions rates for lower-emitting malfunctioning controllers, which would not be detected with OGI. This means that the Tupper et al emissions factor for malfunctioning controllers (24.1 scfh) is too low for the set of controllers that would be identified as malfunctioning with OGI, which will only detect the highest-emitting controllers. As EPA notes, Tupper et al found that approximately 38% of intermittent controllers (99 out of 263) were malfunctioning. The Tupper study made most of its measurements at well production and gathering and boosting sites using a GHD recording high volume sampler with about 0.5 Hz recording, with measurements lasting approximately 15 minutes each. As discussed above, the DOE G&B study clearly found that 15 minutes is not sufficient time to determine whether a controller is malfunctioning. Indeed, the DOE study, using observation times much longer than 15 minutes, found a malfunction rate of 63% for intermittent controllers. Therefore, the results in Tupper are an underestimate of the actual percent of intermittent controllers that are likely to be malfunctioning. But using a less sensitive monitoring technology (OGI) over an even shorter time period than 15 minutes, as OOOOb/OOOOc would require, will result in identifying an even lower number of malfunctioning controllers.

Indeed, data from production sites in Colorado shows that surveys conducted with OGI find much lower malfunction rates. As described in the 2020 Colorado Pneumatic Controller Task Force (PCTF) Report to the Colorado Air Quality Control Commission, a field study was carried out in 2018 under the auspices of the PCTF to study the operation of these devices in the nonattainment area (NAA). One of the goals of this study was to document malfunction rates and causes for controllers that would be found using the state's "find and fix" program. In this program, operators are required to observe pneumatic controllers during their already required instrument-based leak detection and repair surveys, and fix any controller found to be malfunctioning. The study found that 5.6% of the inspected intermittent controllers were operating improperly, far lower than the malfunction rate in either Tupper (or Luck).[51]

Stovern et al. also studied pneumatic controllers in the Denver-Julesberg basin in 2018. This study directly observed that 11.3% of the intermittent controllers were emitting continuously, due to a maintenance issue. However, the study notes that due to methodological issues, this 11.3% figure is probably an underestimate of the actual rate of malfunction among the

intermittent controllers they inspected. They estimate that the true rate of malfunction in their sample was 11.6 – 13.6%, again far lower than the malfunction rate in either Tupper or Luck.[52] The Stovern study was also based on OGI camera inspections of pneumatic controllers and was designed to be a "snapshot in time" to determine whether an intermittent controller was malfunctioning.

The PCTF and Stovern et al studies suggest that the range in the percent of intermittent controllers likely to be found malfunctioning using a snapshot OGI survey is well below the average presented in the Tupper paper, which EPA seeks to rely on.

Similarly, since OGI is less sensitive than a high-volume sampler, operators will classify many lower-emitting controllers that are actually malfunctioning as "properly operating." It would be inappropriate to use the Tupper et al emissions factor for properly-operating controllers (0.3 scfh) for all controllers that "pass the OGI test," since Tupper et al. classified lower emitting malfunctioning controllers that would pass that test as malfunctioning controllers. Therefore, 0.3 scfh would be too low.

Finally, we note that with the passage of the Waste Emissions Charge in the Inflation Reduction Act, many operators will be required to pay a charge of $900–$1,500 per metric ton of methane emissions for all emissions above a threshold set by the Act. Based on simple analysis of past GHGRP reports, a substantial number of onshore oil and gas production operators will have reported emissions above the Act's threshold, and therefore will be required to pay $900 per metric ton of methane emissions in 2024, rising to $1500 per ton in 2026 and thereafter.

An operator reporting the presence of a malfunctioning controller, emitting 24.1 scfh of whole gas, will therefore be reporting over 52 MCF of whole gas emissions, assuming the controller was emitting since the last inspection (and the site is subject to quarterly inspections). Assuming that the gas is about 80% methane by volume, 52 MCF of gas contains 0.8 metric tons of methane. Therefore, under EPA's proposal, operators would be required to pay about $720 for each reported malfunctioning controller found during quarterly inspections in 2024, provided the operator's emissions exceed the emissions threshold (which many of them do).

It is important to note that this cost is likely to lead some operators to under-report the occurrence of malfunctioning controllers (and therefore, their emissions). Given the somewhat subjective nature of OGI inspections, this factor should not be dismissed.

In summary, EPA should not adopt the alternative methodology utilizing separate emissions factors for malfunctioning and properly operating intermittent controllers, based on OGI inspections, due to the lack of appropriate emissions factors for intermittent controllers that have "passed" or "not passed" an OGI inspection, and the problematic incentives that the Waste Emissions Charge would create if such a methodology were in place.

Footnotes

[51] Colo. Air Pollution Control Div., Pneumatic Controller Task Force Report to the Air Quality Control Commission 12 (June 1, 2020) available at https://drive.google.com/file/d/1JStgs0SD2NvZIht1Ti8QQnJAmUZxKgsn/view.

[52] Michael Stovern et al., Understanding oil and gas pneumatic controllers in Denver-Julesburg basin using optical gas imaging, 70 J. Air & Waste Management Ass'n 9 (2020), https://doi.org/10.1080/10962247.2020.1735576.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 8

Comment Excerpt: It is possible to identify and distinguish malfunctioning or "leaking" intermittent-bleed pneumatic devices from properly operating intermittent-bleed pneumatic devices via OGI surveys.

AIPRO generally supports the alternative calculation methodology for intermittent bleed pneumatic devices that allows approved leak surveys (*i.e.,* OGI surveys) to be used to identify and differentiate properly operating devices compared to malfunctioning or leaking devices. This is a practice that many Subpart W reporters already do. That said, the proposed alternative calculation in its current form is a "half-solution," because it still requires the use of "leaker" emissions factors and a determination of "in-service" hours based on a default of 8760 hours (every hour of every day in a reporting year). This approach, even though properly operating devices are confirmed via approved leak surveys, requires reporters to assume properly operating intermittent bleed pneumatic devices are leaking continuously or nearly continuously. Properly operating intermittent-bleed pneumatic devices, as acknowledged by the agency, do not vent continuously. By design and definition, intermittent-bleed pneumatic devices only vent ("process emissions") when they actuate.

EPA incorrectly quotes the term "in operation" from 40 CFR 98.236(b)(2), when the actual term used in the current rule is "were operating." AIPRO believes this distinction is significant, especially for intermittent-bleed pneumatic devices. AIPRO objects to the proposed definition change for variable "Tt" in Eq. W-1A and the corresponding requirement of 40 CFR 98.236(b)(2). EPA states that this definition change is merely to clear up the confusion that reporters have expressed, but there is not clear evidence that this was EPA's intended definition under the current rules. If that were the case, it is illogical that the current rule allows reporters to determine variable "Tt" of Eq. W-1 "using engineering estimates based on best available data" in lieu of the default of 8760 hours, when data to support engineering estimates is unavailable. Further, it appears that at least some of the confusion the agency references as the basis for the change in definition, is the confusion of the agency itself.

Continuing to utilize a "population emission factor" approach that requires reporters to determine operating times for intermittent-bleed pneumatic devices based on the proposed definition change ("in-service...") will perpetuate some of the same GHGRP inaccuracies and poor data quality that EPA says they are attempting to correct with the proposed revisions.

AIPRO incorporates the comments above in response to the equivalent proposed definition changes for pneumatic pumps in 40 CFR 98.233(c)(1) (variable "T" in Eq. W-2) and 40 CFR 98.236(c)(4).

As an alternative to the current proposed revisions, AIPRO proposes the following:
- An alternative calculation methodology whereby reporters can determine actual vent rates for properly operating devices and leak rates for malfunctioning devices via approved quantification method(s) (*i.e.*, High-Flow Sampler) in lieu of using one size fits all emissions factors (just the same as the agency is proposing to allow for Equipment Leak Surveys).
- An alternative calculation methodology that allows reporters to determine and report actual operating or actuating times for properly operating intermittent-bleed pneumatic devices in lieu of utilizing the proposed "in-service" concept which overstates operating times of devices in many cases.

These proposals are consistent with the Legislative mandate from the IRA for Subpart W to be based on "empirical data."

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0230-A1
Comment Excerpt Number: 11

Comment Excerpt: EPA's Technical Support Document (TSD) fails to recognize that other quantification methods are potentially just as valid as measurements for purposes of EF development. Other methodologies with similar or better uncertainties when scaling a smaller sample up to a larger population are valid. Engineering calculations, based on volumetric measurements, pressure measurements, and measurements of actuation counts, are as good as or better than volumetric rates derived from devices that use mass flow meters and calibration curves. EPA's TSD discounts studies that did not use "measurements" by removing them from the basis for proposed EF. It needs to explain the technical basis for this position or correct its position. Similarly, EPA should allow for reporters to consider control devices when applied to pneumatic devices in the calculation methodology similar to other sources.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 6

Comment Excerpt: The Alliance recommends EPA expand the ability of monitored data to replace other elements within the reporting program. The next closest corollary is obviously low-bleed pneumatic devices, but this approach could also be applied to a variety of other sources. Additionally, in order to incentivize additional monitoring, EPA needs to expand the applicability of the monitoring-based emissions calculation methodology. Under the current

proposal, to take credit for monitoring of pneumatic devices, those monitoring efforts must have been done under the direction of subpart OOOOb or an approved state or federal plan. Operators should be permitted to use other monitoring data when available to supplement the emissions factor identification, including but not limited to monitoring conducted in accordance with OOOOa.

For example, if drone-based or aircraft-based surveys have sufficient detection thresholds to identify leaks at the malfunction rate, operators need to be permitted to use that data to characterize pneumatic controllers as either malfunctioning or not, depending on the survey results. Within other provisions in the GHGRP, for example the leak count methodology for fugitive emissions, voluntary data can be used to identify leaks. In the same way, operators should be allowed to use voluntary and other monitoring data to identify equipment as functioning correctly. This will incentivize additional voluntary surveys at a frequency where they are not currently required.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 6

Comment Excerpt: The Proposed Rule fails to allow the use of an emissions factor based on a representative sampling of directly measured device emissions and, therefore, fails to adopt a more accurate accounting of emissions from pneumatic devices.

Subpart W includes a formula for calculating emissions from pneumatic devices at § 98.233(a). This formula requires reporters to use a default emissions factor provided by EPA. The higher the emissions factor, the higher the reported emissions. The emissions factor used by EPA is based on averages and conditions that may not be representative of actual operating conditions.

The Proposed Rule presents an opportunity to provide more transparency around pneumatic device emissions reporting but does not do so in its current form. EPA should provide in § 98.233(a) that reporters may perform direct measurement of emissions from a representative sample of pneumatic devices and report emissions based upon those more accurate conditions, rather than utilizing a formula and default emissions factor.

Direct measurement technology is available and would greatly improve the quality of data being reported. Indeed, representative direct measurement is already utilized for liquids unloading and venting through Calculation Method 1. 40 C.F.R. § 98.233(f)(1).

Moreover, representative direct measurement would build in an additional incentive to reduce emissions from pneumatic devices. This is certainly more accurate than relying on the default emissions factor in Table W–1A. See 87 Fed. Reg. at 37068 for the formula to calculate pneumatic controller emissions using the default emissions factors.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 7

Comment Excerpt: The first chart below shows the number of each type of device that was considered in developing EPA's proposed emissions factors for pneumatic devices. The second chart shows the total number of pneumatic devices reported in the United States. EPA's pneumatic device emissions factors is based on a sampling of only 0.12% of pneumatic devices. A much more representative sampling can be achieved if operators are allowed to perform representative sampling at production sites.

[See DCN EPA-HQ-OAR-2019-0424-0247-A1 for Table: EPA Technical Support (1848 devices sampled)]

[See DCN EPA-HQ-OAR-2019-0424-0247-A1 for Table: 1990-2021 U.S. Greenhouse Gas Inventory of Emissions and Sinks; Annex 3.6 Table 3.6-7, and Annex 3.5 Table 3.5-5 (reports 1,514,202 devices in the U.S.):]

Range proposes that EPA allow operators to conduct representative sampling of the components at its facility in order to develop a more accurate emissions factor. There are industry standard methodologies already in place for quantifying methane emissions from specific sources that operators should be able to utilize and therefore report in a more transparent manner.[3]

Footnotes

[3] For example, the Climate & Clean Air Coalition has published technical guidance for suggested methodologies for quantifying methane emissions from specific sources. Technical Guidance Document Number 1: Natural Gas-Driven Pneumatic Controllers and Pumps, Climate and Clean Air Coalition, 2017, https://www.ccacoalition.org/en/resources/technical-guidance-documentnumber-1-natural-gas-driven-pneumatic-controllers-and-pumps.

Commenter Name: Asa Carre-Burritt, PhD
Commenter Affiliation: Bridger Photonics, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0253-A2
Comment Excerpt Number: 5
Excerpt Status: Not Started

Comment Excerpt: In situations where low bleed pneumatic devices (or in certain situation high-bleed devices) will be exempted from replacement with zero-emission devices, these

devices are to be monitored during fugitive emissions surveys to identify malfunctioning devices which may emit for longer periods or to a greater extent relative to normally actuating devices. An advanced technology possessing suitable performance characteristics could be used to quantitatively measure emissions from these devices and potentially evaluate their performance.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 4

Comment Excerpt: The Oil and Gas Methane Partnership (OGMP) 2.0, a multi-stakeholder initiative launched by the United Nations Environment Programme (UNEP) and the Climate and Clean Air Coalition, classified the actuation count method at a higher level of data quality than using US EPA factors. Actuation count methods are likely to provide more accurate emission data than emission factor methods due to the use of data specific to the intermittent pneumatic device installed and actual operating conditions at the facility. Thus, the MSC requests the option to calculate the volume of gas vented from intermittent pneumatic devices using engineering estimates and actuation counts.

Commenter Name: Michael S. Land
Commenter Affiliation: Terra Energy Partners (Terra)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0207-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA Should Consider Adding a Region-Based Emission Factor to Equation W–1A. Terra supports the emission factor reduction for intermittent bleed pneumatic devices, which is supported by data in studies provided to EPA[4,5] and Terra's own internally gathered field data. The Technical Support Documentation (TSD) accompanying the proposed rule included the Allen Study,[5] which surveyed production sites across 377 pneumatic controllers and four geographical regions. The Allen Study calculated pneumatic device emission factors separately for each region as well as a national factor. Table 2 of the Allen Study summarizes the distribution of emission rates among pneumatic devices and the regional distribution of emissions. Terra agrees with the data in this table that shows there is a vast difference in regional emissions from pneumatic devices and strongly encourages EPA to consider incorporating the more granular level of regional data provided in the Allen Study into Equation W–1A.

Notably, Terra has independently gathered data using approximately 100 days of continuous metering to measure compressed air (as a proxy for natural gas) supplied on three pads to actuate 317 intermittent and continuous low bleed pneumatic devices. We have attached the preliminary

data from this study as Exhibit A.[6] Using this data, we determined the actual pneumatic device usage with the following results:

- Pad 1 — Average of 0.55 standard cubic feet per hour (scfh) per device for 137 devices.[7]
- Pad 2— Average of 0.50 scfh per device for 93 devices.[8]
- Pad 3 — Average of 1.13 scfh per device for 87 devices (this average includes 29 days at 2.1 scfh/device with a connection leak and 70 days at 0.73 scfh/device after the connection leak was repaired).[9]

The average of these results is 0.7 scfh, which supports the 0.8 scfh that the Allen Study identified as the average whole gas emission factor for all pneumatic devices in the Rocky Mountain Region.

Footnotes

[4] Oklahoma Independent Petroleum Association, Pneumatic Controller Emissions from a Sample of 172 Production Facilities, November 2014. Available online: http://vibe.cira.colostate.edu/ogec/docs/Oklahoma/1418911081.pdf.

[5] Allen, D.T., Pacsi, A., Sullivan, D., Zavala-Araiza, D., Harrison, M., Keen, K., Fraser, M., Hill, A.D., Sawyer, R.F., and Seinfeld, J.H., Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Pneumatic Controllers, Environmental Science & Technology (2014). Available online: http://pubs.acs.org/doi/pdf/10.102 1/es5040156.

[6] Exhibit A provides the raw data from the study and a chart that summarizes the data for each pad. Exhibit B summarizes this data in graph form, displaying the pneumatic controller air consumption at each pad.

[7] See Exhibit A, Chart A.1.

[8] Id.

[9] Id.

Commenter Name: Michael S. Land
Commenter Affiliation: Terra Energy Partners (Terra)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0207-A1
Comment Excerpt Number: 3

Comment Excerpt: Ramboll recently conducted a study on behalf of Weld County that evaluated methane trends in northern Colorado over the past decade and found a significant regional methane reduction that coincides with the implementation of increased LDAR inspections in Colorado.[10] The study's preliminary findings indicate that methane concentrations have decreased approximately 52% from the peak in 2013 through 2019. These preliminary findings are significant considering the substantial production increases that occurred during this timeframe. The data evidences the effectiveness of regulations undertaken by Colorado over the

last decade to reduce oil and gas emissions, including methane. Considering that state regulation can have a significant impact on regional emissions, EPA should incorporate a region-based emission factor into Equation W–1A to ensure that it is receiving the most accurate data possible.

Accordingly, EPA should consider adding a region-based emission factor for use in calculating emissions from pneumatic controllers in Equation W–1A. Incorporating a region-based emission factor would increase the accuracy of reported emissions and build a more representative national emissions inventory. Region-based emission factors are supported by Terra's internally collected data and the data from studies submitted to EPA. In addition, region-based emission factors would reward states, like Colorado, that have committed to reducing GHG emissions and adopted robust pneumatic controller regulations to curb excess emissions. Consequently, Terra strongly encourages EPA to consider incorporating a region-based emission factor into Equation W–1A for use in calculating emissions from pneumatic controllers.

Footnotes

[10] Exhibit C, "Preliminary Analysis of Northern Colorado Methane and Ethane Trends Using AIRS Satellite Data and Platteville Surface Measurements," Ramboll (2021).

Commenter Name: Michael S. Land
Commenter Affiliation: Terra Energy Partners (Terra)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0207-A2
Comment Excerpt Number: 1

Comment Excerpt: Commenter submitted the attachment "Preliminary Analysis of Northern Colorado Methane and Ethane Trends Using AIRS Satellite Data and Platteville Surface Measurements," Ramboll (2021).

[Summary of attachment: The document is a preliminary analysis, utilizing satellite and surface measurement data, examining CH_4 trends and reductions over the past decade in an area of Northern Colorado that includes the Denver Metro area and a portion of the DJ Basin north of Denver ("Northern Colorado"). Results of the preliminary analysis indicate there has been a substantial decrease in CH_4 in northern Colorado since concentrations peaked in 2013, despite the increases in oil and gas production that have occurred since 2013. The two measurements utilized are satellite measurements and ground-based, surface measurements. Document includes 10 figures documenting CH_4 trends and 2 tables with means and statistics.]

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 9
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: EPA should expand the ability of operators to determine the length of a malfunction beyond traditional surveys. Operators will have a clear indicator that a malfunctioning device has been addressed based upon by the repair date or other detection approaches that can be provided to EPA. EPA should include any such activity by which an operator can credibly assign a repair date other than a survey as a reporting element. We suggest that EPA revise the definition of T, in equation W–1B to better reflect the implementation of monitoring and repair programs by acknowledging that the duration of the leak may be subject to the action of repair and verification, and not solely by a traditional survey and/or the start or end of the reporting year. For instance, while the current language would require an operator to assign the malfunctioning emission rate to any device found to be malfunctioning from the date of the survey until the end of the year if no other survey is conducted, we suggest that the operator be allowed to apply the repair date as the end of the malfunction period.

Operators that are performing OGI or alternative technology surveys as a regulatory requirement or voluntarily may apply the bifurcated approach. For operations not using such an approach, EPA should allow the use of the single whole gas population emission factor for intermittent devices from Table W–1A of 8.8 scf/hr/device. We support EPA's proposal to retain the option for an operator to apply engineering estimates to determine the time in which the device in service, in lieu of the default 8760 hours.

Commenter Name: Brian K. Woodard
Commenter Affiliation: Chesapeake Energy Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0216-A1
Comment Excerpt Number: 1

Comment Excerpt: The pneumatic device emissions methodology should incorporate control efficiency so that reported emissions are representative of actual emissions. An existing option to reduce GHG emissions from many pneumatic device models is routing the vent stream to another system, such as a vessel or combustion. EPA should incorporate a control efficiency factor into the pneumatic device quantification methodology to represent this type of design. A control efficiency is warranted because this concept is commonly used for Clean Air Act regulation compliance and appears in other Subpart W emissions source quantification methodologies to represent emissions capture and control equipment. Excluding a control efficiency factor for pneumatic devices would mischaracterize and/or dis-incentivize emissions reductions, which would generate unrepresentative information for future policy decisions.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 8

Comment Excerpt: There are some developments of new control and emissions limiting devices that EPA's GHGRP does not currently allow for that would lead to more accurately reported data. For example, the Norriseal Envirosave intermittent vent liquid level controller significantly reduces emissions from pneumatic devices. However, in the GHGRP, this equipment is classified the same as those without, disincentivizing the use, development, and research for new control and limiting devices. The Envirosave pilot was rated at zero leakage in USEPA's The Natural Gas STAR Program Report.[5] As another example, existing pneumatic controllers have potential for their exhaust to be routed to another process such as a burner, flare, catalytic heater, or low pressure header. The Alliance recommends EPA adjust the pneumatic device methodology to allow for these emissions reductions to be expressed by including a control percent factor similar to how EPA has incorporated control efficiencies into other Subpart W emissions methodologies, and as EPA is proposing for pneumatic pumps in which the emissions capture principle is almost identical. Excluding a control percent factor for pneumatic devices disincentivizes this type of emissions reduction since the reductions will be reported under Subpart W.

Footnotes

[5] Technical Support Documents; Options for Reducing Methane Emissions from Pneumatic Devices in the Natural Gas Industry; Appendix A: Gas Bleed Rate for Various Pneumatic Devices; August 18, 2003. – Additional information can be found at Champion X's website: Series EVS Pneumatic Liquid Level Controller | Championx.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 17

Comment Excerpt: Under current GHGRP rules as well as proposed GHGRP revisions, there are multiple scenarios where emissions may be "double-counted," some of these include the below:

- Pneumatic devices assumed to be venting continuously (when using default "operating" or "in-service" hours of 8760 as directed by the rule) under population count methodology AND leaking continually if included in component count approach for fugitive emissions calculations.

AIPRO encourages EPA to identify and eliminate all potential double-counting scenarios. AIPRO welcomes the opportunity to collaborate with the agency on this effort.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 13

Comment Excerpt: The proposed requirements for natural gas intermittent bleed pneumatic devices are per device and not for all intermittent bleed pneumatic devices located at an onshore petroleum and natural gas gathering and boosting facility (*i.e.*, an entire basin). This makes sense, because (as proposed by EPA) pneumatic devices would also be individually subject to OOOOb or an applicable approved state plan or applicable Federal plan contained in part 62, and it will be years before all intermittent bleed pneumatic devices in a G&B basin are subject to such requirements. EPA must therefore clarify that the survey requirement for intermittent bleed pneumatics using equation W–1B applies on a device-by-device basis. Alternatively, EPA could clarify that a "complete" survey refers only to a survey of all intermittent bleed pneumatic devices that are complying with the monitoring requirements of § 98.233(a)(6).

Suggested text: 98.233(a)(6)(ii) You must conduct at least one complete **survey the** pneumatic device ~~monitoring survey~~ **at least once** in a calendar year. If you ~~conduct multiple complete~~ **survey the** pneumatic device ~~monitoring surveys~~ **multiple times** in a calendar year, you must use the results from each ~~complete pneumatic device monitoring~~ survey when calculating emissions using Equation W–1B.

Commenter Name: Not provided
Commenter Affiliation: HLP Engineering, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0194
Comment Excerpt Number: 3

Comment Excerpt: The proposed rule does not address how to report, if at all, pneumatic devices whose emissions are captured or routed back into the process and do not vent any gas. The source type name implies that they are not reported, but the rule should provide clarity.

The proposed rule does not address how to report, if at all, pneumatic devices whose emissions are routed to a flare or combustion device, like it is addressed for natural gas pneumatic pumps.

The proposed rule does not address how to report, if at all, pneumatic devices whose emissions are routed to a combustion source that is not required to report emissions under 98.233(z)(3) or (4).

Commenter Name: Howard R. Dieter
Commenter Affiliation: Jonah Energy LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0200-A1
Comment Excerpt Number: 2

Comment Excerpt: Jonah Energy recommends that EPA expand the current reporting requirement to report the total count of natural gas driven pneumatic devices to three separate counts: the number of natural gas driven pneumatic devices that are vented directly to atmosphere (*i.e.*, uncontrolled); the number of natural gas driven pneumatic devices that are routed to a flare, combustion, or vapor recovery (*i.e.*, controlled); and the total number of natural gas driven pneumatic devices at the facility. Jonah Energy does not have available line power to convert pneumatic devices to non-venting devices. In addition, Jonah Energy operates in a basin that is susceptible to ozone formation during winter months. Therefore, we need to be mindful of adding power sources and their potential to emit ozone precursor emissions. Accordingly, Jonah Energy has been working to connect vents from our natural gas pneumatic devices to our combustors. This allows us to control the vented emissions rather than direct venting to atmosphere. Jonah Energy includes pneumatic devices in our monthly LDAR inspections using OGI cameras. Flared emissions from controlled natural gas pneumatic device vents could either be reported as pneumatic device emissions under pneumatic devices or as flare stack emissions under flare stacks.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 10
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: With respect to the proposed revisions to the regulatory text (Redline), EPA has included a requirement that operators use methods specified in part 60, subpart OOOOb to monitor intermittent bleed pneumatic devices. EPA should not limit operators only to those approaches provided in part 60 or subpart OOOOb. Operators should be able to take credit for any surveys, provided those surveys satisfy current monitoring requirements. We recommend

that EPA strike this requirement, and revise to better reflect the language under § 98.234, which requires the use of methodologies specified in the proposed methane standard (OOOOb) only when required by the standard.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 10

Comment Excerpt: EPA needs to confirm that solenoid devices are not included in pneumatic device equipment counts since they are excluded from the development of EPA's emissions factors and application of the emissions factors would result in overreporting emissions from such devices.

Oil and gas solenoid valves serve a number of functions in the oil and gas production sector, including managing combustion system pilot and main line fuel shutoff and control. The proposed revisions suggest that solenoid devices are not to be included in the pneumatic device equipment counts. First, EPA did not determine an emissions factor for solenoids. If EPA intended for its emissions factors to apply to solenoid devices, it would have determined the specific emissions factor for that type of device or included measured emissions from solenoid devices in the development of the intermittent bleed pneumatic devices emissions factor. It would be inappropriate to apply the emissions factor that EPA has proposed for intermittent bleed pneumatic devices to solenoid devices because the proposed factor does not account for how solenoid devices operate.

The technical backup that EPA provides in support of its Proposed Rule confirms that EPA did not develop information on the volume of emissions from solenoid devices. This can be seen in the chart below, which shows the number of devices represented in each study cited by EPA in support of its Subpart W emissions factors and the number of solenoid devices evaluated in each of those studies. [See DCN EPA-HQ-OAR-2019-0424 for Table of studies and the number of devices and solenoid operated valves represented]

Second, as EPA has recognized and Range's data confirms, emissions from solenoid actuations are rare. This was recognized in the report "Methane Emissions from the Natural Gas Industry, Volume 12: Pneumatic Devices, Final Report," GRI-94/0257.29, EPA-600/R96-08, dated 1996 ("GRI-EPA Report"), which has stood as the basis for pneumatic device emissions factors in Subpart W. That report states: "Because these devices are rare, or rarely bleed, they were ignored for the purpose of this study." GRI-EPA Report at 29-30.

Consequently, EPA should confirm that operators do not need to include solenoid devices in their pneumatic device equipment counts or apply the emission factors developed for other types of intermittent bleed pneumatic devices.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 15

Comment Excerpt: AIPRO recognizes the comment period for proposed rules (more appropriately referred to as, advanced notice of proposed rule-making, as no regulatory text has been provided) NSPS OOOOb and EG OOOOc are closed and that the agency is ostensibly working on a supplemental proposal, with actual regulatory text, which will have a separate designated comment period. That said, AIPRO believes it is critically important to point out the absurdity and inappropriateness of current GHGRP regulations and the associated historical GHG inventories, being the basis for proposed regulations, such as NSPS OOOOb and EG OOOOc. See EPA's comments from Section II.A of the Preamble to the proposed GHGRP revisions. AIPRO agrees with EPA in its conclusion that historical GHGRP data, in many cases, is of poor quality and inaccurate.

To see an illustration of the absurdity, EPA need look no farther than its own proposed GHGRP revisions for calculating emissions associated with intermittent-bleed pneumatic devices.

- Current GHGRP - Subpart W rules require reporters to calculate emissions from intermittent-bleed pneumatic devices by:
    - Utilizing Equation "W–1," where
        - EF_t = 13.5 scf/hr/component for intermittent-bleed pneumatic device vents (from Table W–1A), and
        - T_t = Average estimated number of hours in the operating year the devices, of each type "t," were operational using engineering estimates based on best available data. Default is 8,760 hours. (every hour of every day in a year)
- Proposed GHGRP — Subpart W revisions for calculating emissions from intermittent bleed pneumatic devices allows one of two options:
    - Utilize Equation "W–1A," where
        - EF_t = 8.8 scf/hr/component for intermittent-bleed pneumatic device vents (from Table W–1A), **which represents a nearly 35% reduction compared to the current emissions factor**, and
        - Tt = Average estimated number of hours in the operating year the devices, of each type "t'', were in service (*i.e.,* supplied with natural gas) using engineering estimates based on best available data. Default is 8,760 hours. (every hour of every day in a year)
        - **OR**
        - Utilize Equation "W–1B," which contemplates an entirely new proposed alternative calculation methodology allowing reporters that perform approved leak surveys (*i.e.* LDAR surveys with OGI cameras) to identify properly operating v. malfunctioning intermittent-bleed pneumatic devices, and

- Proposes an EF of 24.1 scf/hr/component for malfunctioning/leaking devices and specifies the method for determining the amount of time a device was assumed to be leaking, and
- Proposes an EF of 0.30 scf/hr/component for properly operating devices and specifies the method for determining the amount of time a device was assumed to be leaking. **This represents a nearly 98% reduction from the current required EF for intermittent-bleed pneumatic devices.**

Although many Subpart W reporters, including multiple AIPRO members, currently perform OOOOa compliant LDAR surveys utilizing OGI cameras, in-line with the proposed GHGRP revisions, and are able to identify properly operating devices v. malfunctioning devices, the current rules do not allow the data to be used. And, as such, significantly overstates GHG emissions from intermittent-bleed pneumatic devices.

To demonstrate how GHG emissions from intermittent-bleed pneumatic devices are significantly overstated by the current GHGRP Subpart W rules v. proposed revisions, see the hypothetical scenario [See DCN EPA-HQ-OAR-2019-0424-0183-A1 for Comparison of Methane Emissions Associated with Intermittent-Bleed Pneumatic Devices as Determined by Current GHGRP "Eq. W-1" v. Proposed GHGRP "Eq. W-1A" v. Proposed GHGRP "Eq. W-1B"].

This example demonstrates that the agency is well aware current GHGRP rules and associated mandated calculation methodologies, significantly overstate emissions for intermittent-bleed pneumatic devices. Yet, the agency utilized historical data from its GHGRP as the basis for policy development, such as the requirements in NSPS OOOOb and EG OOOOc, which will require the Oil & Gas industry, amongst other things, to transition to zero-emitting pneumatic devices. This is estimated to come at the cost of hundreds of millions of dollars or more to the industry and will likely cause many marginal/low rate wells to be shut-in as a result of being uneconomic. This will further suppress supplies of oil & gas and likely inflate energy costs for end users. And, all the while, not actually reduce real emissions as advertised by the agency, because, again, in many cases emissions are significantly overstated by the current rules.

AIPRO strongly encourages the EPA to withdraw the advanced notice of proposed rulemaking for NSPS OOOOb and EG OOOOc in Docket ID No. EPA-HQ-OAR-2021-0317. Further, AIPRO welcomes the opportunity to collaborate with the agency to help develop fit-for-purpose guidelines that are not based on overstated GHG emissions inventories accumulated over the past decade, under the current one-size fits all emissions factor-based GHGRP rules.

A-3. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for natural gas driven pneumatic pump venting

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 47

Comment Excerpt: We support EPA's proposal to revise the definition of variable "T" in Equation W–2 in 40 C.F.R. § 98.233(c)(1) for natural gas driven pneumatic pumps to use the term "in service (*i.e.*, supplied with natural gas)." We also support the proposal to use that same term in the corresponding reporting requirement in proposed 40 C.F.R. § 98.236(c)(4). Given that the population emissions factor for natural gas driven pneumatic pumps reflects average emissions over the period the pump is operating, this revision will ensure that reporters accurately quantify emissions from this component.

We also support EPA's proposal to include flared emissions from natural gas driven pneumatic pumps in the calculation of total flare and flare stack emissions. And we support the proposal to include emissions from natural gas driven pneumatic pumps that are routed to a combustion unit in the calculation of total emissions from the combustion unit. These changes will help ensure flared and combusted emissions are accurately reported. We suggest that EPA extend this proposal to include flared and combusted emissions from all pneumatic devices in the calculation of total flare and flare stack emissions. Future regulatory requirements could make this practice more common.

We further support EPA's proposal to expand the current requirement to report the total count of natural gas driven pneumatic pumps to three separate counts: the count of natural gas driven pumps that vent to the atmosphere (*i.e.*, uncontrolled); the number of natural gas driven pneumatic pumps that are routed to a flare, combustion, or vapor recovery (*i.e.*, controlled); and the total number of natural gas driven pneumatic pumps at the facility. This information would help to better characterize emissions from this source, and provide much-needed data on how many natural gas driven pneumatic pumps are controlled. We suggest that EPA implement a similar reporting requirement for natural gas driven pneumatic devices. There is limited data on how many pneumatic controllers route to process or combustion device; implementing this reporting requirement more broadly would gather better data on controlled and uncontrolled pneumatic devices.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 36

Comment Excerpt: We support EPA's proposal to revise the definition of variable "T" in Equation W–2 in 40 CFR 98.233(c)(1) for natural gas driven pneumatic pumps to use the term "in service (*i.e.*, supplied with natural gas)." We also support their proposal to use that same term in the corresponding reporting requirement in proposed 40 CFR 98.236(c)(4). Given that the population emissions factor for natural gas driven pneumatic pumps reflects average emissions over the period the pump is operating, this revision will ensure that reporters accurately quantify emissions from this component.

We support EPA's proposal to include flared emissions from natural gas driven pneumatic pumps in the calculation of total flare and flare stack emissions. We also support the proposal to include emissions from natural gas driven pneumatic pumps that are routed to a combustion unit in the calculation of total emissions from the combustion unit.

We further support EPA's proposal to expand the current requirement to report the total count of natural gas driven pneumatic pumps to three separate counts: the count of natural gas driven pumps that vent to the atmosphere (*i.e.*, uncontrolled); the number of natural gas driven pneumatic pumps that are routed to a flare, combustion, or vapor recovery (*i.e.*, controlled); and the total number of natural gas driven pneumatic pumps at the facility. This information would help to better characterize emissions from this source, and provide much-needed data on how many natural gas driven pneumatic pumps are controlled.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 15

Comment Excerpt: EPA is proposing that if a pump switches from uncontrolled to controlled during the year, reporters should calculate emissions using both uncontrolled and controlled calculation methods and adjust the time in equation W–2. EPA is also proposing to collect counts of the total number of pumps in addition to the number of controlled pumps and uncontrolled pumps since a pump can be both controlled and uncontrolled during the year.

This requirement is unnecessarily precise and overly burdensome given the very limited number of sources this provision would apply to, even as operators eliminate or control natural gas driven pneumatic pumps. One of the goals of this rulemaking is to streamline implementation, and a requirement to develop and use a mix of partial-year calculation methods for a small number of sources would introduce unnecessary complexity contrary to EPA's overarching goals for this rulemaking. This proposed change would also imply that emissions must be calculated per pump instead of per collection of pumps as equation W–2 otherwise allows. To address these issues in a reasonable and accurate manner, GPA proposes that sources apply the calculation method that represents operation during the majority of the year.

Similarly, collecting data on the total number of pumps in addition to the number of controlled pumps and uncontrolled pumps for the purposes understanding "how often pneumatic pumps are both controlled and vented directly to the atmosphere in the same year" is overly burdensome and unnecessary. Uncontrolled pumps that become controlled will generally switch mid-year (*i.e.*, not on January 1), and will switch just once. Pumps will not move in and out of being controlled throughout the year. Simply collecting the number of controlled pumps and uncontrolled pumps and assessing changes over time should provide sufficient information for EPA to understand pump control changes.

Suggested text:

98.233(c) Natural gas driven pneumatic pump venting. Calculate emissions from natural gas driven pneumatic pumps venting directly to the atmosphere as specified in paragraphs (c)(1) and (2) of this section. Calculate emissions from natural gas driven pneumatic pumps routed to flares, combustion, or vapor recovery systems as specified in paragraph (c)(3) of this section. **If a pump was vented directly to the atmosphere for part of the year and routed to flare, combustion, or vapor recovery system during another part of the year, calculate emissions based on how the pump operated most of the year.** You do not have to calculate emissions from natural gas driven pneumatic pumps covered in paragraph (e) of this section under this paragraph (c).

98.233(c)(3) Calculate emissions from natural gas driven pneumatic pumps routed to flares, combustion, or vapor, recovery systems as specified in paragraphs (c)(3)(i) or (ii) of this section, as applicable. ~~If a pump was vented directly to the atmosphere for part of the year and routed to flare, combustion, or vapor recovery system during another part of the year, then calculate emissions from the time the pump vents directly to the atmosphere as specified in paragraphs (c)(1) and (2) of this section and calculate emissions from the time the pump was routed to a flare or combustion as specified in paragraphs (c)(3)(i) and (ii) of this section, as applicable.~~ For emissions that are collected in a vapor recovery system that is not routed to combustion, paragraphs (c)(1), (2), (3)(i), and (3){ii) do not apply and no emissions calculations are required.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 6

Comment Excerpt: Under the proposed GHGRP, pneumatic pumps are considered to be in service regardless of whether they are actuating, and that number can be reduced to at most once per day. Many pneumatic pumps are in service of applications that do not require activation every day, but only once every several days, based on the need. The best example of this is chemical injection pumps. EPA should provide additional flexibility to reduce the in-service time of pneumatic pumps to a lower value or otherwise use engineering estimates to account for actuation.

Commenter Name: Brian K. Woodard
Commenter Affiliation: Chesapeake Energy Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0216-A1
Comment Excerpt Number: 7

Comment Excerpt: Below is an example with the calculation methodology for pneumatic pumps, where Subpart W allows for a single methodology. However, there is a better way to calculate the emissions based on the known amount of gas emitted per cycle (where this is known) and the number of cycles per year (using company records). The first factor is the emission factor (EF), which can be generated based on the volume of gas emitted per pump cycle based on manufacturer specifications. The second factor in the equation that can be improved is the estimated number of operating hours (T), where guidance from EPA has indicated the operating hours should reflect the days the pump is in service, not the number of actuations. In an alternative calculation methodology, the number of actuations would be used. A suggested additional calculation methodology is:

Es,I = Count * GHGi * EF * T

Where[:] Es,I: Annual total volumetric GHG emissions at standard conditions in standard cubic feet per year from all natural gas driven pneumatic pump venting, for GHGi.

Count[:] Total number of natural gas driven pumps by make and model.

GHGi[:] Concentration of GHGi, CH_4, or CO_2, in produced natural gas as defined in paragraph (u)(2)(i) of this section.

EF[:] The volume of gas emitted per pump cycle.

T[:] The number of pump cycles per calendar year using engineering estimates and company records.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 11
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: We suggest that EPA remove language under § 98.233(c)(3)(i) requiring operators to report emissions from natural gas driven pneumatic pumps without subtracting emissions attributable to gas sent to flare. As written, this language is both confusing and inconsistent with other emissions sources. Emissions from gas sent to flare should be subtracted from emissions attributable to pneumatic pumps in order to minimize the risk of double-counting emissions from pneumatic pumps and gases sent to flare from pneumatic pumps. The recommended edit would be reflected as follows:

§ 98.233(c)(3)(i) If any natural gas driven pneumatic pumps were routed to a flare, you must calculate CH_4, CO_2, and N_2O emissions for the flare stack as specified in paragraph (n) of this

section and report emissions from the flare as specified in § 98.236(n) ~~without subtracting emissions attributable to natural gas driven pneumatic pumps from the flare.~~

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 10

Comment Excerpt: The proposal for pneumatic pumps artificially increases reported emissions. Under the proposal, pneumatic pumps are characterized as in service regardless of whether they are actuating, and that number can be reduced to at most once per day. Many pneumatic pumps are in service of applications that do not require activation every day, but only once every several days, based on the need. The best example of this is chemical injection pumps. The Alliance urges EPA to provide additional flexibility to reduce the in-service time of pneumatic pumps to a lower value or allow a refined calculation where possible based on emissions per pump cycle based on design pump rate and operational data for material pumped.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 16

Comment Excerpt: EPA requests comment on whether pneumatic pumps are routed to vapor recovery systems and whether there are other controls that should be addressed with these new provisions. GPA members were not aware of examples of pneumatic pumps being routed to vapor recovery systems; the emissions from pumps are typically too low to justify using a vapor recover unit for control. GPA members are not aware of other control methods for pneumatic pumps other than flares or combustion.

Commenter Name: Not provided
Commenter Affiliation: HLP Engineering, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0194
Comment Excerpt Number: 2

Comment Excerpt: This proposed rule is still silent on the following issues: 1. The proposed rule does not address how to report, if at all, natural gas driven pneumatic pumps whose emissions are captured or routed back into the process and do not vent any gas. The source type name implies that they are not reported, but the rule should provide clarity considering that clarity was provided for pumps that do not vent but are routed to flares or combustion devices. 2. The proposed rule does not address how to report, if at all, natural gas driven pneumatic pumps whose emissions are routed to a combustion source that is not required to report emissions under 98.233(z)(3) or (4).

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 2

Comment Excerpt: AIPRO recommends that pneumatic pump emissions routed to flares should continue to be reported under 40 CFR 98.236(n).

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 16

Comment Excerpt: Regarding natural gas pneumatic pump venting, EPA has requested comment on whether flared emissions associated with natural gas driven pneumatic pumps should continue to be reported as flare stack emissions under 40 CFR 98.236(n) or under the natural gas driven pneumatic pumps emissions. PBPA recommends this reporting occur under gas pneumatic pumps.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 17

Comment Excerpt: EPA requests comment on whether flared emissions associated with natural gas driven pneumatic pumps should continue to be reported as flare stack emissions under 40 C.F.R. § 98.236(n) or should be reported in the natural gas driven pneumatic pumps emission source under 40 C.F.R. § 98.236(c).

Comment: These emissions should continue to be reported under section 98.236(n). This source is too small to justify the work of parsing out its emissions from the total flare emissions.

Commenter Name: Not provided
Commenter Affiliation: HLP Engineering, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0194
Comment Excerpt Number: 1

Comment Excerpt: If emissions from any natural gas driven pneumatic pumps were routed to combustion, you must calculate emissions for the combustion equipment as specified in paragraph (z) of this section and report emissions from the combustion equipment as specified in *§ 98.236(z).* This portion of the rule seems to recognize that in lieu of venting emissions from pneumatic pumps, those emissions can be routed to various control devices and this rule provides a methodology by which to calculate the associated post-control emissions when the control device is a flare or combustion device. It should be noted that similar "emission controls" or emission reduction technologies can be utilized for pneumatic devices, but the proposed rule does not address any options for alternate calculation methodologies for pneumatic devices. Specific to pneumatic devices, it appears that only pneumatic devices that vent directly to atmosphere are required to be reported under Subpart W.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 5

Comment Excerpt: In response to the US EPA's Request For Comment on whether flared emissions associated with natural gas-driven pneumatic pumps should be reported as flare stack emissions under 40 CFR 98.236(n) or reported in the pneumatic pumps emissions source under 40 CFR 98.236(c), the MSC requests the ability to represent source emissions, including pneumatic devices, as controlled under the specific-source group. Attributing emissions from sources routed to combustion (*i.e.*, enclosed combustion devices) to the sources themselves, for example pneumatic controllers or storage tanks, allows for accurate accounting with regard to keeping the emissions with the source itself, and shows corresponding reductions related to emissions control efforts of individual sources. This is also consistent with permitting efforts,

where we show "controlled emissions" for sources to show their compliance with regard to regulatory requirements.

A-4. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for acid gas removal units

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 66

Comment Excerpt: We support EPA's proposal to include reporting of CO_2 emissions from vents from Acid Gas Removal Units (AGRU) at LNG Import/Export facilities. Facilities in the Onshore Petroleum and Natural Gas Production, Onshore Natural Gas Processing, and Onshore Petroleum and Natural Gas Gathering and Boosting segments of the Oil and Gas industry are already required to report CO_2 venting from AGRUs, and the LNG Export/Import segment is also a large source of emissions from AGRUs. The proposal will require LNG Export/Import facilities to use one of the four calculation methods currently provided in 40 C.F.R. § 98.233(d) and report emissions as currently provided in 40 C.F.R. § 98.236(d), which we support.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 67

Comment Excerpt: We support EPA's proposal to replace the requirement to report solvent weight with solvent type, and with specific amine-based solvents, the general composition. The solvent weight requirement did not previously indicate how the operator should calculate the value, and it was applied inconsistently among operators. The solvent weight did not provide enough details about the AGRU to verify reported data and characterize AGRU vent emissions. This change proposed by EPA will provide clarity and improve the accuracy of data collected.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 23

Comment Excerpt: The EPA's proposal to revise GHGRP to include reporting of CO_2 emissions from Acid Gas Removal Units (AGRU) vents at LNG Import/Export facilities is a significant improvement. Facilities in the Onshore Petroleum and Natural Gas Production, Onshore Natural Gas Processing, and Onshore Petroleum and Natural Gas Gathering and Boosting segments are already required to report CO_2 venting from AGRUs, and the LNG Export/Import segment is also a large source of emissions from AGRUs. The proposal will require LNG Export/Import facilities to use one of the four calculation methods currently provided in 40 CFR 98.233(d) and report emissions as currently provided in 40 CFR 98.236(d). We strongly support this proposal.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 43

Comment Excerpt: For all industry segments required to report CO_2 emissions from AGRU vents, EPA is also proposing to replace the requirement to report solvent weight with solvent type, and in the case of specific amine-based solvents, the general composition. The solvent weight requirement did not clarify how the operator should calculate the value, and it introduced inconsistently among operators. As stated in the revision, the solvent weight also does not provide enough details about the Acid Gas Removal Unit to verify reported data and characterize AGRU vent emissions. As such, this change proposed by EPA is supportable.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 22

Comment Excerpt: Based on the complexity of liquefied natural gas (LNG) systems, INGAA recommends that EPA allow site-specific engineering estimates based on best available data for AGR vents.

EPA requested comments on whether all four calculation methods currently provided in 40 CFR 98.233(d) are appropriate for facilities in the LNG Import/Export industry segment and if not, how specific calculation methods could be adjusted to be more applicable to this industry segment. 98.233(d)(1) through (4) documents four calculation methodologies for CO vented

directly to the atmosphere: Calculation Method 1 (if there is a Continuous Emission Monitor System (CEMS)), Calculation Method 2 (vent meter is installed), Calculation Method 3 (estimation method using inlet or outlet gas flow rates), and Calculation Method 4 (estimation method using simulations from software packages). EPA further states that the estimations under Calculation Methods 3 and 4 (e., 98.233(d)(3) or (4)) may provide incorrect and impossible calculated volumetric emissions. Therefore, EPA correctly proposed new provisions for specific situations for AGR vents comingled with other sources and routed to a flare or thermal oxidizer. Some of these methods still utilize Calculation Methods 3 and 4. With the possible errors in these methods and the further complexity of liquefied natural gas (LNG) systems, INGAA suggests the estimation methods under 98.233(d)(3) and (4) should not be utilized for acid gas removal vents at LNG facilities under any circumstance. LNG facilities are very complex with a variety of technologies and processed integrated. Streams at an LNG facility are often comingled with emissions from other source types. Further, the volume and composition of the streams (directly or comingled) are not necessarily monitored continuously. In these stream situations at an LNG facility the four calculation methodologies do not fit with typical plant procedures. Under certain circumstances, data may be available to utilize Calculation Methods 1 and 2 appropriately. LNG facilities have found that site-specific engineering estimates based on best available data is the most accurate, and sometimes the only way, to calculate emissions.

INGAA recommends that the Proposed Rule be modified to make it clear that site-specific engineering estimates based on best available data will be allowed for calculation emissions from all AGR vents at LNG facilities whenever Calculation Methods 1 and 2 are inappropriate.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 18

Comment Excerpt: For AGRUs (Acid Gas Removal Units), EPA is still requiring that, if present, acid gas vent meter data must be used [Calculation Method 2, 98.233(d)(2)]. EPA should make this method optional. The acid gas vent is a difficult stream to measure. Good measurement can be achieved on streams that have controlled flow rates with decent pressure and consistent composition. This is often not the case on acid gas vents (which tend to have varying flow rates, varying composition, and low pressure). Additionally, Calculation Method 2 requires quarterly sampling of sour gas. This is a difficult sample to take because of the inherent safety concerns (high H_2S), and therefore many facilities would only sample it quarterly to comply with this rule. In contrast, plant inlet and residue gas are generally sampled frequently, and as such, Calculation Methods 3 or 4 may yield more accurate emission estimates than Calculation Method 2.

Suggested text: 98.233(d)(2) Calculation Method 2. If a CEMS is not available but a vent meter is installed, **you may** use the CO_2 composition and annual volume of vent gas to calculate emissions using Equation W–3 of this section.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 23
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: While we support EPA revisions to the reporting requirements for acid gas removal (AGR) vents, the revised language provided requires clarification. As written under § 98.233(d), it is not clear if flared emissions should be reported under the AGR source, under combustion, or under flared emissions. EPA must clarify this point of confusion.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 68

Comment Excerpt: Methane emissions reporting from AGRU vents is not currently required, but it is a significant source of methane emissions. For example, a natural gas processing facility with a throughput of over 700 MMSCD of gas with a composition of over 60% CO_2, ~20% methane, over 7% nitrogen, and remaining balance with hydrogen sulfide and helium would have a significant amount of methane emissions from the AGRU vents. The facility in this example contains two identical natural gas processing trains to process the estimated 700 MMSCFD incoming gas flow rate. It is important to recognize that these methane emission flow rates can vary dramatically by site because they are dependent on the feed gas composition, acid gas removal technology, AGRU separation efficiency, and amount of CO_2 used for enhanced oil recovery (EOR) or other forms of utilization/sequestration. Additionally, separation efficiency can be affected by process flow rates and conditions, which are set based on product specifications.

A study released by EPA/GRI in 1996 to quantify methane emissions from AGRUs (Myers, 1996), assumes that only 18% of the vented methane from the AGRU is released into the atmosphere resulting in an emission factor of 6,083 scfd/AGRU. This significantly underestimates emissions measured at some natural gas processing facilities and incorrectly assumes that facilities only vent a fraction of the methane emissions from the AGRU. The study also estimates the emission factor of 965 scf methane/1 MMSCF of treated gas for an AGRU vent in a natural gas processing facility venting 100% of the methane emissions to the atmosphere. Due to the lack of detailed information about the fraction of methane emissions

from the AGRU vent that is vented directly to the atmosphere, EPA should strongly considered [sic] adding methane reporting requirements from all AGRU vents to more accurately characterize methane emissions from these facilities.

For AGRU vents that are directly releasing methane into the atmosphere, EPA should require operators to use continuous emissions monitoring systems (CEMS), vent meters, simulation software, or calculation methods that use mass balance equations to account for the vented methane emissions from the AGRU vents. In cases where details about the facilities are unknown to calculate emissions using mass balance equations shown below, EPA should consider proposing segment-specific robust emission factors that are reflective of average methane emissions from AGRU vents for each segment.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 44

Comment Excerpt: Methane emissions from AGRU vents are not required to be reported in the current GHGRP for any industry segment, but AGRU units are a significant source of methane emissions, and EPA should require reporting of these emissions.

EPA's US Greenhouse Gas Inventory (US GHGI) estimates that AGRU vents at processing plants nationwide emitted 14,500 metric tons of methane in 2020. Notably, this is more than is emitted by several sources of methane which GHGRP requires processing plant operators to report, or proposes to require operators to report, in this rulemaking. EPA's estimate is based solely on the 1996 GRI study, which modeled emissions from AGRU vents and found a potential emissions factor of 965 scf methane / MMSCF of treated gas. This potential emissions factor (methane emissions of ~0.1% of treated gas for all gas requiring AGRU treatment) suggests that AGRU vents may be a significant source, since the overall leak rate for delivered US natural gas implied by the US GHGI is only 1.3%. The GRI study assumed that only 18% of this gas is vented. It also creates a national estimate of AGRU emissions by normalizing emissions per AGRU, rather than AGRU throughput, and uses an estimate of the number of AGRUs installed nationwide. Apparently, none of these assumptions have been re-examined in the 25 years that have passed since this report was published: EPA has just used activity drivers to adjust the estimate of the number of AGRs. Among other things, EPA estimates that the number of AGRs has declined since 1990, and implicitly assumes that their throughput per unit has remained constant, since the emissions factor per AGRU has remained constant. Since US gas production has roughly doubled since 1990, this approach is questionable at best.

It is important to recognize that these methane emission rates may vary dramatically by site because they depend on the feed gas composition, acid gas removal technology, AGRU separation efficiency, facility vent system design and amount of CO_2 used for enhanced oil recovery (EOR) or other forms of utilization/sequestration. Additionally, separation efficiency

can be affected by process flow rates and conditions, which are set based on product specifications. Due to the lack of detailed information available about the fraction of methane emissions from the AGRU that is vented directly to the atmosphere per facility, EPA should strongly consider adding methane reporting requirements from all AGRU vents to characterize methane emissions more accurately from these facilities. Since a number of factors influencing methane emissions from AGRU vents may be under operator control, or may be determined by facility design, requiring operators to report AGRU methane emissions would call attention to this source and potentially reveal mitigation opportunities.

For AGRU vents that are directly venting into the atmosphere, EPA should require operators to use continuous emissions monitoring system (CEMS), vent meters, simulation software, or calculation methods that use mass balance equations to account for the vented methane emissions.

A-5. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for dehydrator vents

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 6

Comment Excerpt: We support the following proposals:

Removing reporting requirements for desiccant dehydrators in 40 CFR §§ 98.233(e)(3) and (e)(4) and 40 CFR § 98.236(e)(3).

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 24
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: We support the proposed revisions regarding calculating and reporting emissions from dehydrator vents.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation

Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 20

Comment Excerpt: Range supports EPA's proposal to revise the definition of vapor recovery system in 98.6 to clarify that emissions routed to a regenerator firebox do not qualify as vapor recovery.

EPA proposes revising the definition of "vapor recovery system" as follows: "[A]ny equipment located at the source of potential gas emissions to the atmosphere or to a flare, that is composed of piping, connections, and, if necessary, flow-inducing devices, and that is used for routing the gas back into the process as product and/or fuel. For purposes of § 98.233, routing emissions from a dehydrator regenerator still vent or flash tank separator vent to a regenerator fire-box/fire tubes does not meet the definition of vapor recovery system." 87 Fed. Reg. at 37038.

Range has not considered emissions routed to a regenerator firebox to be vapor recovery and has reported these emissions as flared for combusted emissions. Accordingly, EPA's proposed clarifying revisions to the definition of "vapor recovery systems" are consistent with Range's established practices and Range's understanding of what constitutes recovered emissions.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 20

Comment Excerpt: The distinction between these two equipment types ("devices with desiccant that absorb water" vs "devices containing materials that absorb water") is very subtle and not generally understood by reporters. A Google search will show that molecular sieve dehydrators are often called desiccant dehydrators. EPA should not retain a reporting source for "devices with desiccant that absorb water." As noted by EPA, this is a small emission source, and retaining this source will only result in continued confusion by reporters on which non-glycol dehydrators to report or not report.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 17

Comment Excerpt: EPA should clarify that it is not requiring specific software to be used for calculating dehydrator vent emissions and should include Bryan Research and Engineering PROMAX on its list of example software programs to be used for performing such calculations.

The Proposed Rule includes methods of calculating emissions for dehydrator vents. 87 Fed. Reg. at 37070. One of the methods is "Calculation Method 1." Id. This method allows reporters to calculate annual mass emissions from glycol dehydrators by using a software program. The Proposed Rule provides examples of acceptable software programs but does not require the use of the specific software programs listed. The Proposed Rule also does not provide specific criteria for acceptable software programs.

Range believes it would be inappropriate for EPA to require the use of specific software programs to monitor and calculate emissions and believes it is not EPA's intent to favor one vendor over another. Nonetheless, the Proposed Rule would benefit from further clarification on this point.

Additionally, since Range and others in the industry commonly use Bryan Research and Engineering PROMAX software, this software should be added to the examples of acceptable software to avoid any ambiguity regarding Range's ability to use that program.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 18

Comment Excerpt: Range believes that EPA should include Bryan Research and Engineering PROMAX as an acceptable software program under 98.233(j)(1). See 87 Fed. Reg. at 36969, 37073-74.

Specifically, § 98.233(j)(1) provides that an operator may "[c]alculate flashing emissions with a software program, such as AspenTech HYSYS or API 4697 E&P Tank, that uses the Peng-Robinson equation of state, models flashing emissions, and speciates CH_4 and CO_2 emissions that will result when the hydrocarbon liquids form the separator or non-separator equipment enter an atmospheric pressure storage tank."

Although Range believes EPA did not intend to provide an exclusive list of programs, EPA should clarify that Bryan Research and Engineering PROMAX and other similar software programs are also acceptable for monitoring flares at storage tank facilities.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 19

Comment Excerpt: EPA is proposing to collect many new reporting elements for glycol dehydrators: flash tank control technique, regen still vent control technique, flash tank vent gas flow rate, regenerator still vent gas flow rate, concentrations of CH, and CO; in flash tank vent gas, concentrations of CH, and CO; in regenerator still vent gas, type of stripping gas used, and flow rate of stripping gas [98.236(e)].

Comment: EPA should strike these new requirements. GPA originally asked EPA to develop an emission factor for dehydrators with throughputs greater than 0.4 MMscf per day but less than 3 MMscf per day. We requested an emission factor because this group of glycol dehydrators does not generally have an obligation to run an annual emission simulation other than for compliance with the GHGRP (dehydrators with throughput greater than 3 MMscf per day run an annual emission simulation to comply with NESHAP HH), and running these additional simulations solely for GHGRP compliance was time consuming and burdensome. However, EPA recently approved use of BRE Promax simulations (which accommodates bulk runs and provides data exports in GHGRP "friendly" format) for NESHAP HH compliance. This change streamlines running dehydrator simulations for the GHGRP, and GPA members can more easily include these small dehydrators into annual process simulations. As such, GPA is no longer requesting an emission factor for these small dehydrators, and EPA's additional data requests are unnecessary. More importantly, all of these additional reporting requirements add burden and complexity, and EPA does not need to understand the precise details of dehydrators (an already well-regulated emission source) to collect and validate the reported greenhouse gas emissions.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 17
Excerpt Status: Not Started

Comment Excerpt: The GHGRP also includes reporting of operating parameters, such as the presence of a flame in control devices and dehydration unit data. The MSC requests additional detail about how the new reporting elements, such as dehydration unit controls, pump type and rate, and stripping gas parameters, can be used to trend data. Should the information be necessary, the MSC recommends the use of selections via drop-down or ranges. However, without further clarification on the relevance of these new requirements, the MSC does not understand the value of providing this information and believes these details should be left to other programs.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 7

Comment Excerpt: We understand that there were previous requests from other organizations to develop emission factors for dehydrators with a throughput of 0.4-3 mmscfd. This request was made because at that time, it was very burdensome to perform emissions calculations on these lower flowrate dehydrators. With EPA's recent approval of using BR&E ProMax process simulation software to perform dehydrator emissions calculations, this reduces the burden of performing emission calculations on lower flowrate dehydrators; therefore, removing the need to develop the associated emission factors. Since there is no need to develop emission factors, the need for EPA's proposed additional data is unnecessary and would only serve to create additional burden. We request EPA remove the additional data requirements for dehydrator vents.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 11

Comment Excerpt: For glycol dehydrators, EPA is requesting additional operational information such as flow rate, composition, and control technique for flash tank vents and regenerator still vents.[4] While Williams understands EPA is interested in this data, it cautions and urges the Agency to collect this information only if it is committed to developing emission factors in a timely manner for glycol dehydrators with natural gas throughputs less than 3 MMSCFD. EPA's GHGRP Subpart W is the only program where modeling of glycol dehydrators less than 3 MMSCFD is required. Similarly, Williams questions whether the data requested for individual flares will improve emissions data reporting and/or accuracy. It is not evident how this data will add value to EPA's analytics and yet it will add considerable reporting time to supply this information. Given the increased burden on industry, the Agency should only request this data if it has an application beyond "enhancing" data quality.

Footnotes

[4] Proposed Rule, 87 Fed. Reg at 36,966-67.

A-6. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for liquids unloading

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 65

Comment Excerpt: We support EPA's proposal to require reporting on the type of unloading that operators employ, including whether it is automated or manual unloading and whether the unloading is a plunger lift or non-plunger lift unloading. We also support EPA's proposal to require reporting of emissions from automated unloadings separately from manual unloadings. We agree that there could be significant differences in the number and duration of unloadings and differences in emissions between manual and automated plunger lift unloadings and liquids unloading emissions. We believe this additional granularity is important for understanding emissions and informing regulations.

EPA should align reporting under subpart W with that which will be required under OOOOb. In the proposed OOOOb, EPA has moved to require zero emission liquids unloading practices and determined that liquids unloading is a modification, meaning any well that undergoes liquids unloading will be subject to the OOOOb standard.[144] We supported EPA's Option 1 for regulating liquids unloading which would require all wells undergoing liquids unloading to report the number of unloadings and the methods used, including wells using non-emitting methods. We supported the uniform reporting requirement of Option 1, because, as EPA recognized, venting can occur unintentionally even when a non-emitting method is used. The proposed OOOOb standards for liquids unloading would require owners and operators to record and report these instances, as well as document and report the length of venting, and what actions were taken to minimize venting to the maximum extent possible.

In situations where it is technically infeasible or not safe to perform liquids unloading with zero emissions, EPA proposed to require that owners or operators (1) document why it is infeasible to utilize a non-emitting method due to technical, safety, or economic reasons; (2) develop best management practices (BMPs) that ensure that emissions during liquids unloading are minimized including, at a minimum, having a person on-site during the liquids unloading event to expeditiously end the venting when the liquids have been removed; (3) follow the BMPs during each liquids unloading event and maintain records demonstrating they were followed; and (4) report the number of liquids unloading events in an annual report, as well as the unloading events when the BMP was not followed.[145]

This information, which will already be collected from every well undergoing liquids unloading through OOOOb, should also be reported to the GHGRP. In particular, we think it is important for EPA and stakeholders to understand how often non-emitting methods are being used and how often those methods fail and result in vented emissions. For wells where it is technically infeasible or unsafe to use non-emitting methods, it will be important for EPA to understand the

emissions and also understand whether the BMPs are reducing emissions. Including the same data elements reported for OOOOb in subpart W will allow stakeholders to readily access this information and evaluate emissions from various liquids unloading practices.

Footnotes

[144] 86 Fed. Reg. at 63,179.
[145] Id.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 22

Comment Excerpt: We support EPA's proposal to require reporting on the type of unloading operators employ, including whether it is automated or manual unloading and whether the unloading is a plunger lift or non-plunger lift unloading. We also support EPA's proposal to require reporting of emissions from automated unloadings separately from manual unloadings. We agree that there could be significant differences in the number and duration of unloadings and differences in emissions between manual and automated plunger lift unloadings and liquids unloading emissions. This additional granularity is important for understanding emissions and informing regulations.

EPA should align reporting under Subpart W with that which will be required under OOOOb. In the proposed OOOOb, EPA has moved to require zero emission liquids unloading practices and determined that liquids unloading is a modification, meaning any well that undergoes liquids unloading will be subject to the OOOOb standard.[74] We supported EPA's Option 1 for regulating liquids unloading which would require all wells undergoing liquids unloading to report the number of unloadings and the methods used, including wells using non-emitting methods. We supported the uniform reporting of Option 1, because, as EPA recognized, venting can occur unintentionally even when a non-emitting method is used. The proposed OOOOb standards for liquids unloading would require owners and operators to record and report these instances, as well as document and report the length of venting, and what actions were taken to minimize venting to the maximum extent possible.

In situations where it is technically infeasible or not safe to perform liquids unloading with zero emissions, EPA proposed to require that owners or operators (1) document why it is infeasible to utilize a non-emitting method due to technical, safety, or economic reasons; (2) develop BMPs that ensure that emissions during liquids unloading are minimized including, at a minimum, having a person on-site during the liquids unloading event to expeditiously end the venting when the liquids have been removed; (3) follow the BMPs during each liquids unloading event and maintain records demonstrating they were followed; and (4) report the number of liquids unloading events in an annual report, as well as the unloading events when the BMP was not followed.[75]

This information, which will already be collected from every well undergoing liquids unloading through OOOOb, should also be reported to the GHGRP. In particular, we think it is important for EPA to understand how often non-emitting methods are being used and how often those methods fail and result in unintentional vented emissions. For wells where it is technically infeasible or unsafe to use non-emitting methods, it will be important for EPA to understand the emissions and also understand whether the BMPs are reducing emissions. Including the same data elements reported for OOOOb in the GHGRP will allow stakeholders to readily access this information and evaluate emissions from various liquids unloading practices.

Footnotes

[74] 86 Fed. Reg. 63179.

[75] Id.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 8

Comment Excerpt: EPA is proposing additional data collection requirements for non-plunger and plunger lift liquids unloading events that provide additional burdens and complexities for reporters. The calculation methodologies assume that the wellbore is full of natural gas and during the unloading event it is completely vented to the atmosphere. The IRA specifically requires EPA to amend 40 CFR Part 98 subpart W to ensure GHG charges are based on empirical data to accurately reflect the total methane emissions and waste emissions from the applicable facilities. We request EPA allow reporters to conduct engineering studies to determine the best emission data for their sources or allow the collection of actual emissions. This would allow reporters to monitor emissions and make better operational or equipment changes to reduce or eliminate those emissions.

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 5

Comment Excerpt: Liquids Unloading

EPA is proposing to split liquids unloading not only into plunger or non-plunger lift wells, but also to further differentiate liquids unloading reporting based on whether a manual or automated

unloading has occurred. It is not clear to PBPA what accounts for a manual unloading based on the language provided and we recommend this be clarified by EPA. It is further recommended that any clarification of what a "manual unloading" is should provide that manual unloading include actual manned unloading as well as unloading that involves a rig (*e.g.* swabbing); with the understanding that an "automated unloading" is neither manned nor uses a rig, but instead utilizes remote/automated technology. If this differentiation is not the case, PBPA requests that also be clarified.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 25
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: The Industry Trades support proposed revisions to add reporting requirements for liquids unloading events which vent directly to atmosphere or are routed to a control device, including whether the unloading is automatic or manual, specific flow-line and tubing depth data, and the hours that wells are left open during unloading events. However, while EPA may wish to collect such information for verification or to gain a better understanding of industry operations, EPA should clarify that reporting for liquids unloading events should only apply when the gas is vented directly to the atmosphere or routed to a control device. These additions should improve clarity for reporters and provide greater context for emissions for EPA.

Additionally, EPA should consider revising the definition of CD_p in Equation W–8 to ID_p (Internal Diameter) to allow the application of either tubing diameter if the well is equipped with tubing string and no plunger lift, or casing diameter if the well does not have tubing and plunger lift. It is common practice that operators would first install tubing string to increase flow velocity and install plunger lift later when the wells undergo production decline.

A-7. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for blowdown vent stacks

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Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 22

Comment Excerpt: EPA is proposing to allow and clarify use of engineering estimates based on best available information to determine the temperature and pressure of an emergency blowdown.

Comment: GPA supports this change, but we also request that the language "best available information" be applied to all blowdowns. Operators do not always have a temperature or pressure gauge at the blowdown source, nor is it reasonable to expect operators to install such gauges upon a blowdown. It is also not appropriate to request an "engineering estimate" for a simple matter of determining a reasonable estimate of the gas temperature and pressure. "Best available information" is a broad term that requires operators to use their best data, which is an appropriate standard for this requirement.

Suggested text:

98.233(i)(2){i)

Ta = Temperature at actual conditions in the unique physical volume (°F). For emergency blowdowns at onshore petroleum and natural gas gathering and boosting facilities and onshore natural gas transmission pipeline facilities, engineering estimates based on best available information may be used to determine the temperature.

Pa = Absolute pressure at actual conditions in the unique physical volume (psia). For emergency blowdowns at onshore petroleum and natural gas gathering and boosting facilities and onshore natural gas transmission pipeline facilities, engineering estimates based on best available information may be used to determine the pressure.

Ta,p = Temperature at actual conditions in the unique physical volume (°F) for each blowdown "p," For emergency blowdowns at onshore petroleum and natural gas gathering and boosting facilities and onshore natural gas transmission pipeline facilities, engineering estimates based on best available information may be used to determine the temperature.

Pa,b,p = Absolute pressure at actual conditions in the unique physical volume (psia) at the beginning of the blowdown "p." For emergency blowdowns at onshore petroleum and natural gas gathering and boosting facilities and onshore natural gas transmission pipeline facilities, engineering estimates based on best available information may be used to determine the pressure at the beginning of the blowdown.

Pa,e,p = Absolute pressure at actual conditions in the unique physical volume (psia) at the end of the blowdown "p"; 0 if blowdown volume is purged using |non-GHG gases~~. For emergency blowdowns at onshore petroleum and natural gas gathering and boosting facilities and onshore natural gas transmission pipeline facilities, engineering estimates~~ based on best available information ~~may be used to determine the pressure at the end of the blowdown~~.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 4

Comment Excerpt: Williams agrees that EPA should allow the use of engineering estimates based on best available information to determine temperature and pressure of an emergency blowdown for both the Gathering and Boosting segment and the Transmission Pipeline segment to provide flexibility and improve the value of the data provided.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 21

Comment Excerpt: EPA is revising the descriptions of "facility piping" and "pipeline venting" in attempt to reduce confusion about categorizing pipeline blowdowns. Removing the "distribution pipelines" terminology from the description of "pipeline venting" is an appropriate change. However, as EPA notes, because of the expansive definition of "facility" for G&B, most blowdowns associated with pipelines in that industry segment will be categorized as "facility piping" except for occasional blowdowns involving pipelines that span basins, which would be categorized as "pipeline venting." GPA requests that EPA consider whether having two separate definitions for pipeline blowdowns really serves its informational needs, especially since the two categories are rendered meaningless within G&B (and therefore, the two categories cannot be equated between processing and G&B). If EPA can obtain the information it requires with only one category for all pipeline blowdowns, then it should do so.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 5

Comment Excerpt: Williams appreciates EPA's additional clarity provided in the Proposed Rule regarding the definitions of blowdown categories "facility piping" and "pipeline venting" to eliminate confusion between the two.

A-8. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for atmospheric storage tanks

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 7

Comment Excerpt: We support the following proposals:

Reorganizing atmospheric tank reporting requirements in 40 CFR § 98.236(j)(1) to streamline reporting requirements and reduce reporting overlaps and redundancy.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 62

Comment Excerpt: EPA has proposed several updates to the reporting requirements for storage tanks that will improve the accuracy of data collected, and we generally support these updates.

First, EPA provides clarification for operators on how to estimate the amount or gas that is captured using a vapor recovery unit or sent to a flare. Many operators report that the vapor recovery system or flare is capturing 100% of the gas; however, there is ample evidence that VRUs and flares do not always operate with perfect efficiency.[137] This can occur when the VRU or flare is bypassed, is malfunctioning, or when a thief hatch is left open. Thus, it is critical that operators fully account for these periods when estimating the total amount of gas sent to control and the amount of gas directly vented.

We support EPA's proposal to add a new data element that will track the number of open or unseated thief hatches and the total volume or gas that is vented through open or unseated thief hatches. This will improve overall data quality and transparency, and is important because of the significant number of large emissions events that are caused by these sources.[138]

EPA has also proposed updates related to emissions from malfunctioning separator dump valves. Operators are already required to report vented emissions from malfunctioning separator dump valves, but there previously was no explicit mention of how to report emissions from malfunctioning separator dump valves that are flared. This is an important clarification and addition to the reporting program that we fully support.

Footnotes

[137] Zavala-Araiza et al., Super-emitters in natural gas infrastructure are caused by abnormal process conditions, 8 Nat. Comms. 14012 (2017), https://www.nature.com/articles/ncomms14012; Lyon et al., Aerial surveys of elevated hydrocarbon emissions from oil and gas production sites, 50 Env. Sci. Tech. 4877-4886 (2016), https://pubs.acs.org/doi/10.1021/acs.est.6b00705; Rutherford et al., supra note 59.

[138] See, *e.g.*, Zavala-Araiza 2017.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 19

Comment Excerpt: We support EPA's proposal to add a new data element that will track the number of open or unseated thief hatches and the total volume or gas that is vented through open or unseated thief hatches. This will improve overall data quality and transparency, and is important because of the significant number of large emissions events that are caused by these sources.[70]

EPA has also proposed updates related to emissions from malfunctioning separator dump valves. Operators are already required to report vented emissions from malfunctioning separator dump valves, but there previously was no explicit mention of how to report emissions from malfunctioning separator dump valves that are flared. This is an important clarification and addition to the reporting program that we fully support.

Footnotes

[70] Zavala-Araiza et al., Super-emitters, supra note 19; Lyon et al., Aerial surveys, supra, note 27; Rutherford et al., supra, note 15.

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 6

Comment Excerpt: Atmospheric Storage Tanks

EPA has expressed concern about the inclusion of emissions from thief hatches. While the current rule excludes thief hatches from the definition of equipment leaks, when an OGI survey is conducted thief hatches would be included in the examined equipment as part of the tank/cover/closed vent system of controlled tanks to allow exemption of the tank from OOOOa under State permits. Therefore, emissions from a thief hatch would be surveyed and included therein. OOOOa considers emission from thief hatches as fugitive, therefore, it would make more sense to include thief hatches in the equipment leak sources instead of accounting for them under the tanks source.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 23

Comment Excerpt: EPA is proposing to require reporting of the number of controlled tanks with open or unseated thief hatches within the reporting year.

Comment: This requirement should be removed. Tracking and reporting open/unseated thief hatches is not currently required for many older tanks that are not subject to NSPS OOOO/OOOOa. Adding this requirement would greatly expand the number of tanks and facilities that would, in effect, need to comply with the OOOO/OOOOa leak tracking provisions and would create a significant additional burden on reporters. Additionally, for tanks that are subject to OOOO/OOOOa, this data element would be duplicative of the requirements of that rule, and as such, this data element would unnecessarily increase the burden of reporting by requiring the same information in multiple federal reports.

EPA must revise its proposal to eliminate the potential for double counting of tank thief hatch emissions. As proposed, these emissions may be counted under tanks, equipment leak population counts, and equipment leak surveys. As explained below, tank thief hatch emissions should be accounted for under the equipment leak emission sources only. This aligns with EPA's definition of fugitive emissions in NSPS OOOOa. To elaborate on the three areas the same emissions would be counted we have provided the following additional information:

- First, EPA states that if "a reporter sees emissions from a thief hatch or other opening on a controlled atmospheric storage tank during an equipment leak survey conducted using OGI, the reporter should consider that information as part of the 'best available data' used to calculate emissions from that storage tank." EPA says the amount emitted must be quantified and reported and then used to adjust the reported emissions from the tank.

- Second, for leaks by population count, EPA is proposing a population emission factor in Table W–1A (Default Whole Gas Emission Factors for Onshore Petroleum and Natural Gas Production Facilities and Onshore Petroleum and Natural Gas Gathering and Boosting Facilities) of 0.85 scf/hour per storage vessel. The proposed emission factor of 0.85 scf/equipment was derived from data that included thief hatch emissions (as noted in S-5, of the Supplementary Information for Methane Emissions from Gathering Compressor Station in U.S., Zimmerle et al., upon which the proposed emission factors were based). If this factor is finalized, then thief hatch emissions will already be accounted for under equipment leaks by population count.

- Third, for equipment leak surveys, in Tables W–1E (Default Whole Gas Leaker Emission Factors for Onshore Petroleum and Natural Gas Production and Onshore Petroleum and Natural Gas Gathering and Boosting) and W-2A (Default Total Hydrocarbon Leaker Emission Factors for Onshore Natural Gas Processing), EPA includes a component type labeled "Other." A leak from a tank thief hatch is generally accounted for under this "Other" category.

Emissions from an open or unseated thief hatch are difficult to quantify. Additionally, collecting and rolling up this kind of "exception data" is very burdensome in a GHG reporting program.

Reporters already spend a substantial amount of time collecting and verifying data on stuck dump valves. Because quantifying these emissions and collecting this data are not easy, EPA should continue to account for these emissions under the leak categories and remove requirements specifying that unseated or open thief hatches should result in an adjustment to tank emissions. EPA should also remove the requirement to report volume of gas vented through open or unseated thief hatches. Without an involved "research project" this number will likely be an approximation, and EPA will not get the quality of data it needs to "quantify the impact of open thief hatches." It would be appropriate for EPA to clarify that open or unseated thief hatches detected while conducting a leak survey should be categorized as "Other."

We agree that it may not be appropriate to assume 100% recovery or control of emissions from tanks that have a vapor recovery unit ("VRU") or are routed to flare. Most permit applications will include a capture/control percentage for VRUs or flares, and we propose adding language to clarify that permitted capture/control percentages should be considered an "engineering estimate based on best available data."

Finally, in section 10.2 of the "Assessment of Burden" document, EPA claims that these "clarifying edits" to 98.233(j)(4) and (5) related to open thief hatches for atmospheric storage tanks impose no additional burden on reporters. As described above, this is an incorrect assumption.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 13

Comment Excerpt: EPA should not finalize the proposed reporting requirements for controlled tanks with open or unseated thief hatches. EPA is proposing to amend the atmospheric storage tank reporting requirements in 40 CFR § 98.236(j) to require reporting of the number of controlled tanks with open or unseated thief hatches within a reporting year and the volume of gas vented through the open / unseated thief hatches.[13] Such provisions would be similar to current NSPS requirements in Subparts OOOO and OOOOa and as such would be inappropriately redundant with respect to newer tanks.

A further problem with the proposal is that there are a large number of older tanks in operation that are not covered by Subparts OOOO and OOOOa and that are not currently required to calculate and report this data. For those older tanks, finalizing the proposal would effectively result in the "backdoor" imposition of NSPS requirements through the greenhouse gas reporting rules. This would be inappropriate; if EPA has not seen fit to directly impose such requirements via performance standards on older tanks in the NSPS context, then the agency should not reach the same result through amendments to a reporting rule. The proposed requirement would greatly increase reporting burdens, as there are a large number of older tanks in operation.

Accordingly, the proposal is flawed both with respect to newer tanks and older tanks. We urge EPA not to finalize the proposed reporting requirements for controlled tanks with open or unseated thief hatches.

Footnotes

[13] 87 Fed. Reg. 36968 (June 21, 2022).

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 10

Comment Excerpt: The MSC has concerns regarding the use of OGI information as part of "best available data" to calculate emissions from controlled atmospheric storage tanks. While the information from an OGI survey can be used qualitatively to evaluate the performance of a thief hatch or control device, visible emissions from a thief hatch or other opening on a controlled storage tank would not provide sufficient information to quantify the reduced capture efficiency. Thus, the MSC requests USEPA provide clarification or guidance on how reporters should estimate the reduced capture efficiency on controlled storage tanks based on OGI information. Recommendations for how this should be accomplished and also ensure double counting within other segments of the rule doesn't occur include:

- Recognize the difference between a leaking component and a venting scenario.
- Consider including components of closed vent systems (CVS) in fugitive emission source segments of the rule.
- Address open thief hatches on a CVS, over-pressure scenarios of the CVS, malfunctioning vapor recovery units (resulting in flaring or venting), and unlit flares or combustors in the storage tank section of the rule and define how capture efficiency, destruction efficiency, and combustion related emissions must be calculated in each scenario.

Commenter Name: Douglas Jordan
Commenter Affiliation: Western Midstream Partners, LP
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0202-A1
Comment Excerpt Number: 7

Comment Excerpt: Some of the proposed rule elements that we oppose include the following items which are further detailed in the comments WES has endorsed (American Petroleum Institute, Gas Processors Midstream Association, and Texas Pipeline Association): Requiring the tracking and reporting of open and/or unseated storage tank thief hatches.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 26
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: The Industry Trades support the proposal of changes to the reporting requirements for atmospheric storage tanks, including the use of emission control devices, flash gas concentrations, and tank counts.

Operators have expressed confusion over the proper reporting category of emissions from unseated or not properly seated thief hatches. Some operators have reported emissions from thief hatches in the storage tank source category, while others have reported these emissions as equipment leaks. EPA should clarify into which source category emissions from thief hatches should be reported. Additionally, EPA should provide additional clarity regarding methodologies for determining reduced capture efficiency when a vapor recovery unit is in use but a thief hatch is not properly seated or closed.

Commenter Name: Howard R. Dieter
Commenter Affiliation: Jonah Energy LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0200-A1
Comment Excerpt Number: 3

Comment Excerpt: Jonah Energy encourages EPA to consider allowing an option of using OGI with quantification or drone-based methane sensor technology to quantify emissions associated with activities such as water hauling or oil sales that necessitate opening a thief hatch for gauging and thieving. We are deploying both OGI with quantification and drone-based methane sensor technology and could use the results of those surveys to develop a local emission factor for opening thief hatches and use that to estimate the quantity of emissions.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 12

Comment Excerpt: The Alliance supports the proposed adjustments to the reporting requirements for atmospheric storage tanks, and provisions for the use of control devices and site-specific flash gas calculations. However, the changes in the proposed rule specific to adjusting the default value for tanks based on thief hatch operation do not provide EPA with the most accurate data for tank emissions. Similar to the approach that EPA is proposing to be used in the pneumatic device program, EPA needs to instead incorporate methodology that allows operators to track and report thief hatch openings and malfunctions associated with closed-vent systems and vapor recovery units. The current rule excludes these thief hatches from the definition of equipment leaks, but under EPA's OOOOa rules (and in subsequent upcoming OOOO series rule changes) the tank cover, closed vent system and thief hatches are required to be included in the LDAR program to exempt those tanks from OOOOa under a state permit program. Operators will therefore have the data to report thief hatches that are found to be open or malfunctioning during a survey. However, to facilitate this, EPA needs to propose different scenarios by which a thief hatch could be found during an LDAR survey and differentiate factors for those scenarios. Specifically, in the storage tank section of the rule, specific emissions quantification calculations need to be developed for thief hatches that are found to be open or in an overpressure scenario of the closed-vent system, storage tanks that are routed to malfunctioning vapor recover units, and storage tanks that are routed to equipment that is functioning according to design. Then, in the fugitive emissions source section of the rule, a provision needs to be included for thief hatches that are leaking, outside of an overpressure or vapor recover unit malfunction scenario. This would provide for the most accurate data, and also incentivize robust design and maintenance programs by allowing operators to take advantage of reporting that accurately reflects the circumstances present in their deployed equipment.

Commenter Name: Asa Carre-Burritt, PhD
Commenter Affiliation: Bridger Photonics, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0253-A2
Comment Excerpt Number: 6

Comment Excerpt: Emissions from atmospheric storage tanks and separators are regularly detected by Gas Mapping LiDAR™. [2,8] We advocate that the EPA include measurements by advanced technologies of emissions from open or improperly seated thief hatches on atmospheric storage tanks and malfunctioning separator dump valves as part of the "best available data" for calculating emissions from these sources.

Footnotes

[2] Tyner, D. R. & Johnson, M. R. Where the Methane Is - Insights from Novel Airborne LiDAR Measurements Combined with Ground Survey Data. Environ Sci Technol 55, 9773–9783 (2021)

[8] Collaboratory to Advance Methane Science. Permian Basin Survey: An array of aerial surveys in the Permian Basin to acquire the baseline distribution of methane emission rates and sources. Scientific Insights Preprint at https://methanecollaboratory.com/wpcontent/uploads/2021/08/Scientific-Insights-Aerial-Survey-in-Permian-August2021_vFinal.pdf (2021).

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 25

Comment Excerpt: Annual transmission tank measurements (to detect a leaking scrubber dump valve) and annual leak surveys should be optional rather than a mandatory requirement. Leak survey results and transmission tank measurements over the last decade provide insight into the associated emissions and prevalence of anomalies such as scrubber dump valve leaks. For example, the August 2019 PRCI report documented leak prevalence based on 2011 — 2016 GHGRP data in a report provided to EPA.[22] Operators should have the option to calculate emissions based on industry-wide or company-level emission factors based on available measurement data. Additional context on reporting for leaky scrubber dump valves is provided in Comment 3.4, as substantive emissions from an operational anomaly would be addressed under the "other large release event" category that is being added to Subpart W.

Extensive data collected over more than a decade allows for the development of emission factors that characterize T&S operations. Accordingly, EPA should allow operators to use available emission factors — based on industry-wide or company-specific measurement data — rather than continuing to require ongoing annual leak measurements and leak surveys at T&S facilities.

Footnotes

[22] PRCI Report Catalog No. PR-312-16202-R03, "Methane Emissions from Transmission and Storage Subpart W Sources," August 2019.

Commenter Name: Charles E. Venditti
Commenter Affiliation: CountryMark Energy Resources, LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0181-A1
Comment Excerpt Number: 6

Comment Excerpt: Page 617 (98.233 (j)) states, "For wells flowing directly to atmospheric storage tanks without passing through a separator with throughput greater than or equal to 10 barrels per day, calculate annual CH_4 and CO_2 emissions using Calculation Method 2 as specified in paragraph (j)(2) of this section." Page 619 (98.233 (j)(2)) Calculation Method 2 states, "Calculate annual CH_4 and CO_2 emissions using the methods in paragraph (j)(2)(i) of this section for gas-liquid separators with annual average daily throughput of hydrocarbon liquids greater than or equal to 10 barrels per day." Is Method 2 to be used when a separator is in service or not in service?

EPA has not provided guidance or requirements for operators when a separator will not function properly. The separator will not function properly when the gas to oil ratio is not high enough or when slug flow operation is experienced. If a separator will not properly function during this period, collecting gas samples and measuring a flow rate will not be successful. We recommend that operators are not required to report on emissions when a separator are not physically capable of operating. During periods of slug flow operation, we do not want to risk the safety of our people to collect composition or flow rate data from the stream.

Commenter Name: Ryan Watts
Commenter Affiliation: Kentucky Oil and Gas Association (KOGA)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0182-A1
Comment Excerpt Number: 12

Comment Excerpt: Page 617 (98.233 (j)) states, "For wells flowing directly to atmospheric storage tanks without passing through a separator with throughput greater than or equal to 10 barrels per day, calculate annual CH_4 and CO_2 emissions using Calculation Method 2 as specified in paragraph (j)(2) of this section." Page 619 (98.233 (j)(2)) Calculation Method 2 states, "Calculate annual CH_4 and CO_2 emissions using the methods in paragraph (j)(2)(i) of this section for gas-liquid separators with annual average daily throughput of hydrocarbon liquids greater than or equal to 10 barrels per day." Is Method 2 to be used when a separator is in service or not in service?

EPA has not provided guidance or requirements for operators when a separator will not function properly. The separator will not function properly when the gas to oil ratio is not high enough or when slug flow operation is experienced. If a separator will not properly function during this period, collecting gas samples and measuring a flow rate will not be successful. We recommend that operators are not required to report on emissions when a separator are not physically capable of operating. During periods of slug flow operation, we do not want to risk the safety of our people to collect composition or flow rate data from the stream.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 27
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: EPA should review the requirement for use of Method 3 for any facility producing less than 10 barrel per day threshold on a separator-throughput basis. This approach is burdensome to calculate, requiring interpolation when calculating the average oil throughput. It is not clear if operators should be including days with no production, or all days within a production year. We recommend allowing operators to use calculated flash emissions (*i.e.*, Method 1) for any facility regardless of threshold. We also recommend allowing operators to base the 10 barrel per day threshold for using Method 3 on the volume produced to tanks rather than separators.

We request that EPA consider simplifying the choices of calculation methods for hydrocarbon liquids that are flowing to either gas-liquid separators, or non-separator equipment, or directly to atmospheric storage tanks with throughput less than 10 barrels per day. This could entail the options below:

- If a representative oil analysis is available and hydrocarbon liquids are flowing to gas-liquid separators, the operator may choose to use Method1.
- If a representative oil analysis is available and hydrocarbon liquids are flowing directly to atmospheric storage tanks, the operator may choose to use Method 2.
- Otherwise, the operators should use Method 3.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 29
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: Another deficiency in the Method 3 approach is that it does not provide a complete hydrocarbon analysis (only methane and carbon dioxide). This may result in an underestimation of CO_2 emissions in some cases, such as when a tank is controlled by a flare. Rather than prescribing specific methane and carbon dioxide emissions factors, operators should be allowed to apply the whole gas emission factors with adjustment for sub-basin composition.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 32

Comment Excerpt: EPA is proposing to add the reporting element of flow-weighted average concentration (mole fraction) of CO_2 and CH_4 in flash gas from onshore production and onshore natural gas gathering and boosting storage tanks (calculated as the sum of all products of the concentration of CO_2/CH_4 in the flash gas for each storage tank times the throughput for that storage tank, divided by the sum of all throughputs from storage tanks).

Comment: As proposed, this addition would create a significant additional burden on reporters over the current requirement to report the minimum and maximum CO_2 and CH_4, without providing EPA useful additional information. Calculating flow-weighted averages is time consuming and can be difficult to implement accurately in database software systems that are utilized by many reporters due to the way that multiple tables and data types often need to be cross referenced and brought together to calculate a flow-weighted average. GPA proposes that EPA instead modify this requirement to report to a straight average, rather than a flow-weighted average in order to reduce the complexity of complying with this requirement but still incorporates stream specific data. Additionally, GPA notes that as currently written the text describing the calculation of the flow weighted average could be interpreted to use the tank liquid throughputs in the calculation of that average, rather than the total flash gas volume. GPA therefore suggests the changes below to clarify that the average should be calculated based on the volume of flash gas produced rather than the liquid throughput of the tanks.

Suggested text:

98.236(j)(1)(vii) The ~~flow-weighted~~ average concentration (mole fraction) of CO_2 in flash gas from onshore production and onshore natural gas gathering and boosting storage tanks (calculated as the sum of all products of the concentration of CO_2 in the flash gas for each storage tank ~~times the throughput for that storage tank~~, divided by the sum of all **flash gas emissions** ~~throughputs~~ from storage tanks) ("XCO_2" in Equation W–20 of this subpart if the flash gas is routed to a flare).

98.236(j)(1)(viii) The ~~flow-weighted~~ average concentration (mole fraction) of CH_4 in flash gas from onshore production and onshore natural gas gathering and boosting storage tanks (calculated as the sum of all products of the concentration of CH_4 in the flash gas for each storage tank ~~times the throughput for that storage tank~~, divided by the sum of all **flash gas emissions** ~~throughputs~~ from storage tanks) ("XCH_4" in Equation W–20 of this subpart if the flash gas is routed to a flare).

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 9

Comment Excerpt: EPA is proposing to require:

- The reporting of the number of controlled tanks with open or unseated thief hatches within the reporting year, as well as the total volume of gas vented through the open or unseated thief hatches,
- Account for malfunctioning dump valve emissions, and
- Provide more specific hydrocarbon composition information, *i.e.*, EPA is proposing to request the flow weighted average concentration (mole fraction) of CO_2 and CH_4 in the flash gas, rather than the minimum and maximum flash gas concentrations.

These proposed requirements will provide new and additional burdens on those entities that are not currently subject to NSPS OOOO/OOOOa requirements. In regard to the proposed hydrocarbon composition information being requested, a simpler process would be to require a straight average instead of a flow weighted average. We request EPA use a straight average for the hydrocarbon composition information being proposed instead of a weighted average concentration of CO_2 and CH_4 in the flash gas.

A-9. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for associated gas venting and flaring

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 56

Comment Excerpt: EPA notes that companies appear to have been misinterpreting the requirement, and reported the same value for "volume of associated gas sent to sales for each well in the sub-basin during time periods in which associated gas was vented or flared" and "total volume of gas sent to sales for the facility." In these cases, operators may be overestimating venting and flaring. It appears that equation W–18 assumes that operators are venting or flaring all of their gas during certain periods, and venting or flaring none of their gas during other periods. However, this equation does not account for the periods when the operator is venting or flaring a portion of the gas produced, but not all of the gas produced. We suspect that operators reported the same value for the gas volumes because some portion of that volume was vented or flared during the entire time period, but there was no way to specify this detail.

Thus, we suggest EPA add a reporting option so that operators can report both the time periods in which venting and flaring was occurring, and the portion of the gas produced that was vented or flared.

While making this clarification would improve data quality for associated gas venting and flaring, ultimately requiring flow measurement devices for all sites would eliminate this confusion entirely. A direct measurement of gas sent to the flare unit would allow reporters to better estimate the associated gas vented from individual emission sources between the well and flare. In many cases, reporters would be able to subtract the volume of gas sent to a flare from the flow measurement device from the total amount of vented and flared associated gas (equation W–18) to calculate the total volume of associated gas venting. Incorporating requirements for measurement devices, such as continuous flow measurement devices for flare units or flare temperature sensors, would greatly improve the accuracy of estimates for many reported emission sources.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 40

Comment Excerpt: EPA notes that companies appear to have been misinterpreting the requirement and reported the same value for "volume of associated gas sent to sales for each well in the sub-basin during time periods in which associated gas was vented or flared" and "total volume of gas sent to sales for the facility." In these cases, operators may be overestimating venting and flaring. However, it appears that equation W–18 assumes that operators are venting or flaring all of their gas during certain periods and venting or flaring none of their gas during other periods. However, this equation does not account for the periods when the operator is venting or flaring a portion of the gas produced, but not all of the gas produced. We suspect that operators reported the same value for the gas volumes because some portion of that volume was vented or flared during the entire time period, but there was no way to specify this detail. Thus, we suggest EPA add a reporting option so that operators can report both the time periods in which venting and flaring was occurring, and the portion of the gas produced that was vented or flared.

While EPA's clarification and the update would improve data quality for associated gas venting and flaring, ultimately requiring flow measurement devices for all sites would eliminate this confusion entirely. A direct measurement of gas sent to the flare unit would allow reporters to better estimate the associated gas vented from individual emission sources between the well and flare. In many cases, reporters would be able to subtract the volume of gas sent to a flare from the flow measurement device from the total amount of vented and flared associated gas (equation W–18) to calculate the total volume of associated gas venting. Overall, incorporating just a few requirements for measurement devices, such as continuous flow measurement devices for flare units or flare temperature sensors, will better the estimates for many reported emission sources

and bring reported vented and flared emissions closer to achieving the imperative to empirically quantify methane emissions set forth by U.S. Methane Emissions Reduction Action Plan.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 31
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: The Industry Trades support proposing changes to reporting requirements regarding the use of continuous flow monitors. We recommend that EPA revise the definition of variable $SG_{p,q}$ in Equation W–18 to better capture the total volume of natural gas moving through the natural gas system. As currently written, the variable is only representative of gas sent to sale, omitting natural gas used on site at the facility. This underestimates the total volume of gas in the system. The definition of variable $SG_{p,q}$ should be revised to read: "Volume of associated gas sent to sales or used for other purposes at the facility site, including powering engines, separators, and other combustion equipment, and safety systems, for well p in sub-basin q, in standard cubic feet of gas in the calendar year only during time periods in associated gas was vented or flared."

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 7

Comment Excerpt: Associated Gas Venting and Flaring

Among our members, there is confusion as to whether or not EPA intends to require the use of continuous flow measurement devices for calculating flared emissions. Instead, some members feel EPA is only providing the option to use continuous flow monitors on flares for reporting venting and flaring emissions of associated gas, but that EPA is not requiring that continuous flow monitors be used. We recommend EPA clarify if the intention is to require the use of continuous flow measurement devices for calculating flared emissions or if this is just an option. In support of flexibility in the use and evolution of technics and technology, we recommend it be an option.

A-10. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for flare stack emissions

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 53

Comment Excerpt: We support EPA's proposed additional reporting requirements for individual flare stack characteristics, which are necessary to better understand the relationships between flare taxonomy and operation. In addition to flare unit characteristics, we recommend adding reported data elements covering the maximum and minimum flow values of the flare itself. These data elements will help EPA understand whether emissions are coming from high- or low-pressure flares, and the overall purpose of an individual flare in relation to other equipment on the site.

The overall effectiveness of a flare relies on the flow falling within an optimal range. During helicopter based OGI flights conducted from 2020-2021, EDF documented several flare stacks consistently burning with large amounts of incomplete combustion. We suspect that the incomplete combustion is a result of an air assist increasing gas flow beyond the flare stacks' optimal range. As more research organizations and companies independently conduct field observations, reporting of these characteristics would help enrich these observations and collectively help all stakeholders better understand possible causes of these emissions.

While the proposed restructuring will make how to report flared gas emissions more clear, and reporting flare stack characteristics will enrich flare unit level data, there are no proposed elements that will improve the underlying quality of how flare gas emissions are calculated. Without improvements on what reporters put into the inventory, the inventory will not capture the nature of flared gas emissions that has been documented through research.[127]

Footnotes

[127] Note also our recommendations that LNG Import/Export facilities continuously monitor flare and engine emissions, or at least use frequent stack testing rather than default emission factors. This is discussed in more detail in the LNG Related Processes section below.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 55

Comment Excerpt: The rate of unlit flares is a prevalent issue across the oil and gas industry. Multi-basin research has identified unlit flares across the entire country, and a Permian Basin study using flights conducted in 2020 found 5% of all active flares were unlit.[131] According to GHGRP flare unit data for 2020, the average fraction of gas sent to an unlit flare for all flares located in the Permian was ~1%. While the observations from Lyon et al. (2021) are a measure of frequency and do not account for how much gas was released volumetrically, as a proxy the data shows there is a large divergence between reported and observed activity of unlit flares.[132]

Current and proposed reporting requirements and elements require reporters to determine the fraction of gas sent to an unlit flare using the best available engineering estimate and process knowledge. EPA's proposal to require reporting on whether or not a continuous pilot is used and how, generally, periods of unlit flares are determined is insufficient. There is no express requirement to monitor nor connect this activity data to the amount of gas produced during the unlit period. Additionally, it is unclear from the proposal how a reporter should specify if or how they monitor ignition of the flare that has an auto-igniter instead of continuous pilot, as it is still possible for auto-igniters to malfunction resulting in an unlit or poorly combusting flare. The lack of ignition monitoring requirements and reporters' reliance on engineering estimates is a likely cause of the gap between reported and observed flaring activity.

We urge EPA to consider methods for empirically monitoring flare ignition. Specifically, EPA should require reporters to use such methods alongside their production activity to report the temporal duration a flare was unlit, and how much gas was emitted during these durations. Many flares are already equipped with temperature transmitters that monitor the pilot light and can be incorporated into a site's SCADA system. By combining this activity data alongside the gas production data or a continuous flow measurement device attached to the flare, reporters can accurately measure the volume of gas sent to an unlit flare. EPA and stakeholders would then be able to use the categorical data on pilot light type to assess which configuration of flares operates with the least malfunctions and longest periods of uptime.

To incorporate the possibility of auto-igniters failing leading to an unlit flare, we ask EPA to expand reporting requirements. Specifically, EPA should require reporters to answer these questions: "If the flare has an auto-igniter, is the presence of the flame monitored during periods when the auto-igniter is activated and gas is routed to the flare?" and "If the flare has an auto-igniter and the flame is not monitored during active periods, how does the reporter verify that combustion is occurring?"

Footnotes

[131] Lyon et al., Concurrent Variation, supra note 68.

[132] Id.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 33

Comment Excerpt: We support the additional reporting requirements for the individual flare stack characteristics, which are necessary to better understand the relationships between flare taxonomy and operation. In addition to flare unit characteristics, we suggest adding reported data elements covering the maximum and minimum flow values of the flare itself. These data elements will help EPA understand whether emissions are coming from high- or low-pressure flares, and the overall purpose of an individual flare in relation to other equipment on the site. The overall effectiveness of a flare relies on the flow falling within an optimal range. During helicopter-based OGI flights conducted from 2020-2021, EDF documented several flare stacks consistently burning with large amounts of incomplete combustion. We suspect that the incomplete combustion is a result of an air assist increasing gas flow beyond the flare stacks' optimal range. As more research organizations and companies independently conduct field observations, reporting of these characteristics would help enrich these observations and collectively help all stakeholders better understand possible causes of these emissions. While the proposed restructuring will make it clearer on how to report flared gas emissions and the requirement of reporting flare stack characteristics will enrich the reporting program's flare unit level data, there are no proposed elements that will improve the underlying quality of how flare gas emissions are calculated. Without improvements on what reporters put into the inventory, the inventory will not capture the nature of flared gas emissions that has been documented through research.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 35

Comment Excerpt: Unlit flares

The rate of unlit flares is a prevalent issue across the oil and gas industry. Multi-basin research has identified unlit flares across the entire country, and a Permian Basin study using flights conducted in 2020 found 5% of all active flares were unlit.[62] According to GHGRP flare unit data for 2020, the average fraction of gas sent to an unlit flare for all flares located in the Permian was ~1%. While the observations from Lyon et al. (2021) are a measure of frequency and do not account for how much gas was released volumetrically, as a proxy the data shows there is a large divergence between reported and observed activity of unlit flares.[63] Current and proposed reporting requirements and elements require reporters to determine the fraction of gas sent to an unlit flare using the best available engineering estimate and process knowledge. EPA's proposal to require reporting on whether or not a continuous pilot is used and how, generally, periods of unlit flares are determined is insufficient. There is no express requirement to monitor nor connect this activity data to the amount of gas produced during the unlit period. Additionally, it is unclear from the proposal how a reporter should specify if or how they monitor ignition of

the flare that has an auto-igniter instead of continuous pilot, as it is still possible for auto-igniters to malfunction resulting in an unlit or poorly combusting flare. The lack of ignition monitoring requirements and reporters' reliance on engineering estimates is a likely cause of the gap between reported and observed flaring activity. We urge EPA to consider methods for empirically monitoring flare ignition. Specifically, EPA should require reporters to use such methods alongside their production activity to report the temporal duration a flare was unlit, and how much gas was emitted during these durations. Many flares are already equipped with temperature transmitters that monitor the pilot light and can be incorporated into a site's SCADA system. By combining this activity data alongside the gas production data or a continuous flow measurement device attached to the flare, reporters can accurately measure the volume of gas sent to an unlit flare. EPA and stakeholders would then be able to use the categorical data on pilot light type to assess which configuration of flares operates with the least malfunctions and longest periods of uptime To incorporate the possibility of auto-igniters failing leading to an unlit flare, we ask EPA to expand reporting requirements. Specifically, EPA should require reporters to answer these questions: "If the flare has an auto-igniter, is the presence of the flame monitored during periods when the auto-igniter is activated and gas is routed to the flare?" and "If the flare has an auto igniter and the flame is not monitored during active periods, how does the reporter verify that combustion is occurring?"

Footnotes

[62] Lyon et al., Concurrent variation, supra note 19.

[63] Id.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 32
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: The Industry Trades support the proposed revisions regarding the source of gases sent to flares, types of flares, use of auto-igniters or continuous pilots and monitoring of the flare, and indication of how an operator identifies if a flare is unlit. However, as noted regarding both AGR vents and pneumatic devices, the proper reporting of emissions from gases sent to flares appears to be inconsistently applied or at times unclearly communicating. EPA should review all references to emissions from flared gases to ensure that revisions are consistently and clearly applied and communicated.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association

Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 24

Comment Excerpt: EPA should move away from dissecting flare emissions source-by-source and thereby introducing enormous complexity in data collection, calculation, reporting and the rule text itself. As a general matter, most facilities do not have meters on every individual source that can be routed to a flare and determining exact volumes or compositions for any individual source is often a rough estimate at best. EPA seems to be on an investigatory quest to understand the nature of flare emissions at a fine grain, and even if it was possible to do so with data routinely available at facilities (which we argue, it is not), imposing the detailed and prescriptive requirements to collect this information in an annual reporting program applicable to the vast majority of flares in oil and gas is beyond burdensome and is wholly unnecessary to determine greenhouse gas emissions from flares.

EPA is proposing to require the flow-weighted annual average mole fraction of CH_4 over all streams from a particular emission source type that are used in equation W–19 to calculate the reported flared CH_4 emissions from that emission source type (and used in equation W–20 to calculate CO_2 emissions). [98.233(n)(5)]

The changes EPA is proposing are unnecessarily prescriptive and will not result in the most accurate emission calculations. Depending on how a site is configured, it can be very difficult, if not impossible, to determine specific flow volumes from each source being controlled by a flare, particularly for miscellaneous sources. Flow from individual sources to a flare is not usually metered, especially in cases where comingled flow is metered at the flare header. Reporters should be allowed to report composition based on best available data, including but not limited to comingled waste gas stream samples, comingled waste gas stream continuous analyzers, engineering estimates, and flow-weighted annual average mole fractions. These methods would provide as valuable information for characterizing flare stack emissions as flow weighted annual average mole fractions would and are much less burdensome for reporters. Other compliance programs involve periodic (*e.g.*, monthly) sampling of the gas sent to flares, yet the proposed rule would not allow for the use of such data. The proposed rule should therefore be revised to align its requirements with other, similar programs.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 33

Comment Excerpt: For G&B and Processing, EPA is proposing to require an estimate of the fraction of the gas burned in the flare that is obtained from other facilities specifically for flaring as opposed to being generated in on-site operations [98.236(n)(1)(v)].

Comment: This element of EPA's proposed rule would not be reasonable for reporters and would not have any impact on the amount of greenhouse gas emissions reported. Requiring reporters to estimate the volume of gas flared from each emission source type, or from each facility in the case of shared flares, may result in flare volumes being inaccurately attributed to each emission source type or facility. Depending on how a site or gathering system is configured, it can be very difficult to determine specific flow volumes from each source being controlled by a flare, particularly for miscellaneous sources. Flow from all sources is not necessarily metered, especially in cases where comingled flow is metered at the flare header. This also applies in cases where a flare is shared by multiple facilities. Our operators note that it can take multiple months, multiple staff, and essentially a research project to understand certain flaring events. Without expending significant time and effort to research the root sources of all flaring activity, the data reported will be at best a rough estimate and would not necessarily provide EPA with relevant information on sources of flared emissions. Additionally, flaring is often due to a pressure imbalance along the value chain; where that pressure is relieved/flared may be determined by a variety of factors, but this flared gas isn't easily classified as "obtained from other facilities" or "generated on site." This can be something of a chicken-and-egg question. Finally, flared gas may not be Subpart W sources, such as pressure relief valves on pressurized vessels.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 35

Comment Excerpt: EPA requests comment on the types of sources that may be generating large emissions from flares and whether other reporting elements could be specified that would better achieve EPA's objective of clearly characterizing the sources of flared emissions from facilities involved in Production, G&B, and Processing. For example, one potential additional reporting element could be a requirement to describe the primary source of miscellaneous flared emissions for any flare that reports CO_2 emissions greater than an amount that would be determined if such a reporting requirement were finalized.

EPA should not proceed down this path. Parsing all flare emissions into their root sources would be an enormous burden to reporters. Depending on how a site or gathering system is configured, it can be very difficult to determine specific flow volumes from each source being controlled by a flare, particularly for miscellaneous sources. Flow from independent sources is not necessarily metered, especially in cases where comingled flow is metered at the flare header. This also applies in cases where a flare is shared by multiple facilities. It can take multiple months, multiple staff, and essentially a research project to understand certain flaring events. Without expending significant time and effort to research the root sources of all flaring activity, the data reported will be a rough estimate at best and would not necessarily provide EPA with relevant information on sources of flared emissions. The intent of the GHGRP is to inform future rulemaking, and it is very unlikely that any trends to inform rulemaking could be derived from

such reporting; even if there are common emission sources, the causes of such emissions are likely to be widely variable. If EPA has a desire to better understand flaring sources and root causes, then it should undertake appropriate research projects or data requests outside of this annual reporting program.

For flared sources, EPA requests comment on whether proposed changes to describe the applicable procedures for calculating flared emissions for each source type separately rather than trying to generally describe a single set of consolidated procedures makes the rule easier for reporters to understand. Per our previous comments, we do not support reporting requirements to parse out flare emission data, and the procedures for calculating flare emissions are overly prescriptive.

Commenter Name: Asa Carre-Burritt, PhD
Commenter Affiliation: Bridger Photonics, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0253-A2
Comment Excerpt Number: 7

Comment Excerpt: The EPA notes that "researchers conducting remote sensing tests of emissions from flares have reported detecting much larger quantities of emissions from un-lit flares than is evident from the GHGRP data."[9] This illustrates the value that advanced measurement technologies have for quantifying emissions from this source category. Although these technologies may not specifically indicate whether the flare is lit or unlit, the magnitude of emissions detected for a flare stack may provide a good approximation. Furthermore, these measurements can help eliminate the gap in emissions accounting for these important sources under subpart W. [2,8]

Footnotes

[2] Tyner, D. R. & Johnson, M. R. Where the Methane Is - Insights from Novel Airborne LiDAR Measurements Combined with Ground Survey Data. Environ Sci Technol 55, 9773–9783 (2021).

[8] Collaboratory to Advance Methane Science. Permian Basin Survey: An array of aerial surveys in the Permian Basin to acquire the baseline distribution of methane emission rates and sources. Scientific Insights Preprint at https://methanecollaboratory.com/wpcontent/uploads/2021/08/Scientific-Insights-Aerial-Survey-in-Permian-August2021_vFinal.pdf (2021)

[9] US Environmental Protection Agency. Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule. 87 FR 36920 36920–37119 (2022).

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 34

Comment Excerpt: Proposed Change: Annual reporting of information related to flare equipment.

Comment: EPA should not request data that does not directly relate to calculating and verifying GHG emissions. EPA needs to have clear purpose for how any collected data will be used to validate GHG emissions. Broad information requests are not appropriate for this annual reporting rule. These new requirements should therefore be eliminated. If EPA proceeds with this unnecessary data collection, then EPA must add an option of "Other."

EPA is requesting that the fraction of gas sent to an unlit flare be reported twice for each flare — once for the source-level reporting, and then again for the flare event reporting.

Comment: EPA should eliminate duplicative reporting requirements. These numbers will almost certainly be the same, as it will be extremely difficult for reporters to calculate the exact proportion of gas that is flowing to a flare from each source in any period when a flare is unlit and arrive at unique fractions for the individual sources versus the overall volume.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 14

Comment Excerpt: EPA should not require reporting of flared gas from other facilities. TPA is opposed to the proposed requirement at 40 CFR § 98.236(n)(1)(v) for facilities in the Onshore Petroleum and Natural Gas Production, Onshore Petroleum and Natural Gas Gathering and Boosting, and Onshore Natural Gas Processing industry segments to estimate and report the fraction of total volume of gas burned in a flare that was received from another facility solely for flaring. To begin with, such data would not be the sort of emissions volume information that has traditionally been the focus of the greenhouse gas reporting program. Beyond that, the proposed requirement would pose severe and possibly insurmountable difficulties for companies trying to comply. It can be very difficult to ascertain the particulars of flaring events, particularly when, as is sometimes the case, flow from a particular source is not metered. Adding to the challenge of ascertaining flow associated with flaring events is that a flare may be shared by two or more different facilities. Gas flow is a dynamic and fluid phenomenon, occurring at complex facilities and often involving flow comingled from various sources. The task of breaking down flaring event, to the detail level of ascertaining which portion of the flared gas was (1) received from another facility (2) solely for flaring, would present extraordinary difficulties in practice, if it could be accomplished at all. We urge EPA to refrain from finalizing this requirement, which as noted above is outside the scope of the traditional greenhouse gas reporting program in any event.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 10

Comment Excerpt: EPA proposes several additional reporting requirements related to flare stack emissions, *e.g.*, flare IDs, unlit flares, sources routed to flares, type of flares and types of flare assists, etc. This additional information unnecessarily increases the complexity and burdens on reporters. We question the need for some of this data and whether it is relevant to emissions or just additional data points. We request EPA provide more clarity as to the need of the additional data points and to re-evaluate its proposed additional data point collection and reporting requirements to ensure they are necessary and relevant to emissions reporting.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 21

Comment Excerpt: The proposed flare activity reporting requirements found at 98.236(n)(2)(ii) do not support GHG emissions reporting or validate reported GHG emissions.

Proposed section 98.236(n)(2)(ii) includes requirements to report information such as the flare name or other identification information, the types of emission sources routed to the flare, total volume of gas routed to the flare, the type of flare, estimated fraction of the total volume routed to the flare when it is not lit, flare assist type, whether the flare has a continuous pilot or auto igniter, whether a continuous pilot is continuously monitored, and if the continuous pilot is not monitored, how periods when the pilot is not lit are identified. None of this information is used to calculate or validate GHG emissions. If EPA requires this information for something other than GHG reporting, it should obtain it through a formal information request that includes rationale for why this information is needed instead of including the information in this rulemaking. INGAA therefore recommends that EPA remove the proposed requirements found at 98.236(n)(2)(ii).

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 54

Comment Excerpt: The GHGRP currently allows operators to assume 98% combustion efficiency of converting natural gas CH_4 into CO_2 based on the findings of a technical report conducted in controlled settings. However, in situ measurements of flares across multiple basins show an average of ~95% combustion efficiency, with an even lower average (91%) occurring for flares in the Permian Basin.[128] In 2020, all production-segment flare units in the Permian with emissions reported having at least 98% combustion efficiency. The universal application of this assumption by reporters is driving an underestimation of flared gas CH_4 emissions, and is a contributing factor to the divergence between EPA estimates and top-down estimates based on empirical measurements.

We recommend that EPA lower the 98% combustion efficiency assumption to 95%, thereby aligning it with existing regulatory standards and the average multi-basin combustion efficiency observed in Plant et al. (2022).[129] That study is based on samples of more than 600 intercepts of flare combustion plumes, representing more than 300 distinct flares across the three basins responsible for over 80% of US flaring.[130] As flaring activity and performance may differ at the basin level, in the future we encourage EPA to consider segmenting the combustion efficiency assumption per basin according to in-situ measurements. We also recommend that EPA require Permian Basin facilities to report using the 91% efficiency observed in the Plant study. This study contains the most recent, comprehensive, and accurate data on flare efficiency in the Permian.

Footnotes

[128] Genevieve Plant, et al., Inefficient and Unlit Natural Gas Flares Both Emit Large Quantities of Methane, 377 Science 6614 (2022), https://www.science.org/doi/10.1126/science.abg0385.

[129] Id.

[130] Id.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 34

Comment Excerpt: The GHGRP currently allows operators to assume 98% combustion efficiency of converting natural gas CH_4 into CO_2 based on the findings of a technical report conducted in controlled settings. However, in-situ measurements of flares across multiple basins show an average of ~95% combustion efficiency, with an even lower average (91%) occurring for flares in the Permian Basin.[59] In 2020, all production-segment flare units in the Permian with emissions reported having at least 98% combustion efficiency. The universal application of this

assumption by reporters is driving an underestimation of flared gas CH_4 emissions and is a contributing factor to the divergence between EPA estimates and top-down estimates based on empirical measurements.

We recommend that EPA lower the 98% combustion efficiency assumption to 95%, thereby aligning it with existing regulatory standards and the average multi-basin combustion efficiency observed in Plant et al. (2022).[60] That study is based on samples of more than 600 intercepts of flare combustion plumes, representing more than 300 distinct flares across the three basins responsible for over 80% of US flaring.[61] As flaring activity and performance may differ at the basin level, in the future we encourage EPA to consider segmenting the combustion efficiency assumption per basin according to in-situ measurements. We also recommend that EPA require Permian Basin facilities to report using the 91% efficiency observed in the Plant study. This study contains the most recent, comprehensive, and accurate data on flare efficiency in the Permian.

Footnotes

[59] Plant et al., Inefficient and unlit natural gas flares both emit large quantities of methane, 377 Science 6614 (2022), https://www.science.org/doi/10.1126/science.abq0385.

[60] Id.

[61] Id.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 33
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: EPA has requested comment on the types of sources that may be generating large miscellaneous emissions at gathering and boosting facilities. Some operators have indicated a centralized flare may be utilized at these facilities to burn associated gas from production facilities during periods of maintenance or malfunction of the compressors connected to the midstream system. Another source of miscellaneous flaring can come from equipment blowdowns that are routed to the flare. Currently these are not reported under (i) blowdown vent stacks.

A-11. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for flared transmission storage tank vent emissions

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Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 19

Comment Excerpt: Historical GHG reporting data indicate that it is not necessary to monitor tank vents annually when tank emissions are routed to a flare.

EPA is proposing that transmission tanks emissions routed to a flare should not be a specific source but be classified as miscellaneous flared source. EPA has proposed this because, as is documented in the preamble to the Proposed Rule, over the past 6 years for transmission tank vent stacks routed to a flare there have been no leaks reported and the reported flared emissions have been 0 metric tons of GHGs. INGAA agrees with this reclassification.

However, the EPA is proposing to retain the current requirements in 40 CFR 98.233(k)(1) and (2) to monitor the tank vent stack annually for leaks and to quantify the leak rate if a leak is detected. As was stated in the preamble, there have been no leaks reported over the past 6 years. Therefore, we believe that the requirements to continue to monitor for leaks should be eliminated. Eliminating the monitoring requirements for the transmission storage tanks when there have been no emissions reported over the past 6 years is consistent with the stated intent to streamline monitoring and calculation methodologies where "continuing to collect data on the same frequency would unlikely provide significantly different values."

As an additional point, it is INGAAs understanding from the preamble that the transmission tank monitoring is required because "it would not be possible to tell if there were any scrubber dump valve leaks if only a combined emission stream is measured." [29] INGAA does not believe the tracking of dump valves emissions is reason enough to justify the monitoring of every transmission tank given the low-GHG emissions from this category of sources. This does not advance Objective II.A.2 "Improvements to Existing Emission Estimation Methodologies" and we believe it goes against Objective II.B.2 "Revisions to Streamline Monitoring and Calculation Methodologies." The rules requiring the knowledge of the total flare volume and composition are adequate to accurately account for emissions from the transmission tanks.

For these reasons INGAA recommends that EPA remove the requirement to monitor transmission storage tanks when they are routed to a flare.

Footnotes

[29] Page 285 of 820 in the "revisions-and-confidentiality-determinations-for-data-elements-under-the-greenhousegas-reporting-rule." [sic]

A-12. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for compressors

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1

Comment Excerpt Number: 12
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: The Industry Trades appreciate the agency's proposals to add alternate modes under which operators can report estimated emissions from compressors. We recommend that EPA not require reporting under all modes, as compressors may or may not achieve certain modes during a given year. Flexibility is warranted to ensure that reporting requirements can be met. We support language clarifying the applicability of acoustic leak detection methods.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 11

Comment Excerpt: Reciprocating Compressors. Within the compressor section of the rule, the Alliance appreciates the flexibility in using alternative modes for reporting estimated emissions, however, it needs to include provisions to allow flexibility between modes, and not be a requirement that operators follow one or the other. To ensure accurate reporting and that operators can meet requirements, both options must be available.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 61

Comment Excerpt: While the standby pressurized mode is less common, emissions do occur during standby mode in centrifugal compressors, and adding this will provide clear guidance to operators. We therefore support this proposal.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 41

Comment Excerpt: While the standby pressurized mode is less common, emissions do occur during this mode, and adding this will provide clear guidance to operators.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 25

Comment Excerpt: EPA is proposing to remove the requirement to measure in the not-operating depressurized mode every three years, and EPA is proposing to add new mode-source combinations.

Comment: It is possible that mode-source combination measurements may occasionally not exist, especially if a reporter calculates emission factors at the facility level. EPA should include a provision for using the last valid reporter emission factor in that circumstance.

Suggested text:

98.233(o)(6)(iii)…

Eq. W-23

EFs,m = Reporter emission factor to be used in Equation W–22 of this section for compressor mode-source combination m, in standard cubic feet per hour. The reporter emission factor must be based on all compressors measured in compressor mode-source combination m in the current reporting year and the preceding two reporting years. **If the mode-source combination was not measured in the current reporting year and the preceding two reporting years, use the last valid reporter emission factor at the facility, or use a company-wide factor.**

98.233(p)(6){iii)…

Eq. W-28

EFs,m = Reporter emission factor to be used in Equation W–27 of this section for compressor mode-source combination m, in standard cubic feet per hour. The reporter emission factor must be based on all compressors measured in compressor mode-source combination m in the current reporting year and the preceding two reporting years**. If the mode-source combination was not measured in the current reporting year and the preceding two reporting years, use the last valid reporter emission factor at the facility, or use a company-wide factor.**

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 2

Comment Excerpt: We support the following proposals:

Eliminating requirements in 40 CFR 8§ 98.233(o)(1)(i)(C) and (p)(1)(i)(D) to conduct measurements in not-operating-depressurized-mode as well as associated reporting requirements in 40 CFR §§ 98.23

Commenter Name: Douglas Jordan
Commenter Affiliation: Western Midstream Partners, LP
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0202-A1
Comment Excerpt Number: 2

Comment Excerpt: Some of the proposed rule changes we encourage, and support include: Removal of the requirement to measure compressors in the "not-operating-depressurized" mode.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 3

Comment Excerpt: Williams supports EPA's proposal to remove the requirement for obtaining depressurized mode venting measurements from reciprocating and centrifugal compressors a minimum of every three years for the Processing and Transmission Compression segments. This requirement forced companies to intentionally shut down compressors and blowdown equipment resulting in GHG emissions that would not have otherwise occurred.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 12

Comment Excerpt: The Proposed Rule would add new measurements for T&S centrifugal compressors with dry seals and for reciprocating compressor rod packing in standby pressurized mode. Mandatory new measurement requirements are not warranted, and EPA should allow operators the option of using other data sources for estimating emissions.

EPA has acknowledged that the GHGRP is not intended to include 100% of facility emissions but rather focus on key sources. Thus, EPA choose not to include centrifugal compressor dry seal emissions (in operating or standby pressurized mode) or reciprocating compressor emissions in standby pressurized mode in Subpart W reporting. The Proposed Rule would add measurement for those emission sources. INGAA recommends allowing operators to use emissions factors for compressors based on a wealth of measurement data for operating modes included in Subpart W since 2011. INGAA does not support new measurement requirements for compressors based on perceived data gaps that EPA did not deem relevant when Subpart W was originally adopted. If EPA's position has changed, operators should be provided the option to conduct additional measurements or estimate dry seal emissions and standby pressurized rod packing emissions based on other emissions rate data available and the annual hours in the respective modes.

For centrifugal compressors with dry seals, emissions could be estimated based on vendor data (*e.g.*, data from Solar, which is the prevalent manufacturer of T&S turbines) or measurement data available from on-board instrumentation for some units. For the former, a Solar Product Information Letter (PIL)[23] presents typical dry seal leak rates as a function of operating pressure. For the latter, some units measure this rate with the onboard operational control system to track seal health. The rule should allow and provide clarity for clear operating and maintenance requirements for such devices (*e.g.*, follow manufacturer specifications) so that the continuous measurement data can be used. These data sources are also preferred because the systems are not designed to accommodate access for a periodic measurement. Positive line pressure would result in leakage into the compressor house, and potentially trigger gas sensors, which could result in unit shutdown and venting to atmosphere.

Footnotes

[23] Solar Turbines, Product Information Letter (PIL) 251, "Emissions from Centrifugal Compressor GasSeal Systems," January 2019.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 13

Comment Excerpt: For reciprocating compressor rod packing, measurements are currently required in operating mode and a wealth of measurement data is available. For standby

pressurized mode, the emission rate could be based on previous studies (*e.g.*, see discussion in PRCI compressor emission factor paper), measurement data from operating mode, or other data available in the literature. The larger contributing factor to these "missing" emissions is the amount of time not accounted for in the current rule (*i.e.*, 2011 — 2016 data analyzed by PRCI indicated reciprocating compressors, on average, are in standby pressurized mode 30% of the time) rather than deviation in the hourly leak rate for the two modes where rod packing leakage occurs.

EPA previously determined that rod packing emissions in standby pressurized mode was not warranted but the Proposed Rule changes that perspective. This conclusion is questionable because the collective emissions from rod packing is very likely lower than when Subpart W was initially adopted and will continue to decrease (and not significantly contribute to total facility emissions) because rod packing is regulated for new sources and is or will be regulated for existing sources by the EPA (Subparts OOOO, OOOOa, and proposed OOOOb and OOOOc) and/or by state regulations.

At a minimum, if EPA believes that this previously excluded source should be added to Subpart W reporting, available data from rod packing measurements in operating mode and from the literature should be closely scrutinized to assess whether the emissions implications justify this change in EPA's position, and justify the need for new measurements rather than relying on other available emission rate data.

For both sources, information or related data are available to provide an emission rate for estimating annual emissions. Thus, new measurement requirements for dry seals and for rod packing in standby pressurized mode are not warranted. At most, EPA should require measurement for two or three years then eliminate the new measurement requirement once data is available for this source and allow operators to use company-specific emission factors based on their past measurement data.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 60

Comment Excerpt: We support EPA's proposal to add dry seal vents to the defined compressor sources for centrifugal compressors and to require measurement of volumetric emissions from the dry seal vents in both operating mode and in standby-pressurized-mode. As EPA notes, while dry seal centrifugal compressors have lower emissions than wet seal centrifugal compressors, these emissions are not negligible and thus should be accounted for.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 18

Comment Excerpt: We support EPA's proposal to add dry seal vents to the defined compressor sources for centrifugal compressors and require measurement of volumetric emissions from the dry seal vents in both operating-mode and in standby-pressurized-mode. As EPA notes, while dry seal centrifugal compressors have lower emissions than wet seal centrifugal compressors, these emissions are not negligible and thus should be accounted for.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 20

Comment Excerpt: Clarity is needed on dry seal monitoring.

63.233(o)(2)(iii) requires volumetric measurements for centrifugal compressor dry seal vents. As a point of clarification, a dry seal compressor has two dry seals (see figure below'): a dry seal on the gas side compressor (inboard) and a dry seal on the air side motor and shaft bearing (outboard). There are "very little" gas emissions from the dry seal on the outboard side according to EPA's documentation on reducing emissions from compressor seals, and therefore there is no reason to require volumetric emissions from the outboard dry seal.

INGAA requests that EPA clarify that 233(o)(2)(iii) include only measuring volumetric emissions from the compressor side dry seal.

Additionally, permitted measurement techniques proposed in 40 CFR 98.233(o)(2)(ii)(A) through (D) consist of manual methods such as temporary anemometers and flow meters (*e.g.*, rotameters) and other rudimentary methods. Orifice, venturi, and nozzle devices are covered in 98.3(i)(3).

Other devices for measuring vented emissions may include thermal dispersion meters and Coriolis meters. The rule should allow for such meters or other measurement devices to be used either thru BAMM application or as outlined in the monitoring plan. OEMs and third-party vendors may already provide monitoring systems for dry seal vents; however, they would be excluded for use under the Proposed Rule because they don't fall under the specific measurement techniques or standards as noted in 98.238(o)(2)(ii)(A) through (D). EPA should add language allowing operators to use other measurement techniques (including BAMM) for all years starting in 2023 and beyond.

For orifice, venturi, and nozzle devices, 98.3(i)(3) states 'initial quality assurance consists of in-situ calibration of the differential pressure (delta-P), total pressure, and temperature transmitters.' It should be noted that in order to calibrate pressure or temperature transmitters in situ, cutting and alterations of the vent piping will be required which will require the gas compressor to be shut down and taken out of service. The in-situ calibration clause should be removed from the above citation so that these transmitters could be removed from service and replaced with factory or site-calibrated transmitters, allowing minimal disruption to pipeline operations.

For these reasons volumetric emissions should not be required on the motor and shaft bearing side.

Commenter Name: Not provided
Commenter Affiliation: Solar Turbines Incorporated
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0229-A1
Comment Excerpt Number: 3

Comment Excerpt: Other extant devices for measuring vented emissions may include thermal dispersion meters and Coriolis meters. The rule should allow for such meters or other measurement techniques/devices to be used either thru BAMM application or as outlined in the monitoring plan. OEMs and third-party vendors may already provide monitoring systems for dry seal vents based on various measurement techniques, however these would be excluded for use under the GHGRP per the proposed rule revisions because they don't fall under the specific measurement methods or standards as noted in 98.238(o)(2)(ii)(A) through (D). EPA should add language allowing operators to use other measurement techniques (including thru BAMM) for all years starting in 2023 and beyond.

Commenter Name: Not provided
Commenter Affiliation: Solar Turbines Incorporated
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0229-A1
Comment Excerpt Number: 4

Comment Excerpt: Allowed measurement techniques for dry gas seal emissions proposed in 40 CFR 98.238(o)(2)(ii)(A) through (D) consist of manual methods such as temporary anemometers and flow meters (*e.g.*, rotameters) and other rudimentary methods. Orifice, venturi, and nozzle devices are covered in 98.3(i)(3).

For orifice, venturi, and nozzle devices 98.3(i)(3) states 'initial quality assurance consists of in-situ calibration of the differential pressure (delta-P), total pressure, and temperature transmitters.' It should be noted that in order to calibrate pressure or temperature transmitters in-situ, cutting

and alterations of the vent piping will be required which will require the gas compressor to be shut down and taken out of service. The in-situ calibration clause should be removed from the above citation so that these transmitters could be removed from service and replaced with factory or site-calibrated transmitters, preventing disruption to pipeline operations.

Commenter Name: Howard R. Dieter
Commenter Affiliation: Jonah Energy LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0200-A1
Comment Excerpt Number: 4

Comment Excerpt: Jonah Energy supports EPA's proposal to add reporting methodology to account for reciprocating rod packing emission that are controlled.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 59

Comment Excerpt: We believe EPA's proposed methods for reporting emissions from reciprocating compressors are adequate as long as measurements are taken correctly and capture all locations where methane is venting. Often rod packing vents are manifolded together, though they are sometimes separate, so it is important for the reporter to know the design to fully and accurately measure the emissions from these vents.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 17

Comment Excerpt: We would like to note that EPA's proposed methods for reporting emissions from reciprocating compressors should be reasonable as long as the measurement is done correctly and in a way that will capture all of the places that methane is venting. Often rod

packing vents are manifolded together, so it is important for the reporter to know the design to fully and accurately measure the emissions from these vents.

Commenter Name: Tamara S. Maddox
Commenter Affiliation: Alaska Oil & Gas Association (AOGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0214-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA should revise the proposed requirements for centrifugal wet seal compressors to allow compressors equipped with sour seal oil separator and capture systems to use the proposed dry seal measurement and reporting methods.

AOGA appreciates and supports the proposed revision for wet seal compressors with oil degassing vents routed to a flare, combustion, or vapor recovery to not be reported under paragraph (o) (proposed 40 C.F.R. 98.233(o)(10)), however AOGA does not believe this proposal goes far enough to capture the range of engineering systems that wet seal compressors may employ. This proposal would seemingly only apply to wet seal compressors which route all emissions to a closed capture system, excluding other highly effective configurations utilized in Alaska.

The wet seal compressors in Alaska differ in configuration from the compressors described in the proposed rule. The proposed rule contemplates only two wet seal compressor design variations—those which vent all emissions to atmosphere or those that vent no emissions to atmosphere. Missing from the proposal is acknowledgement of and guidance related to designs which capture most emissions but still have a small residual vent to the atmosphere like the sour seal oil trap systems employed in Alaska.

In Alaska, wet seal compressors are deployed on the Alaska North Slope (ANS) and in the Cook Inlet region. On the ANS, the production wells yield a three-phase liquid comprised of water, crude oil, and reservoir gas. This mixture is routed by infield pipeline to processing facilities where the crude oil is separated from gas and water for sale. During this process, separated gas is a byproduct from oil processing. Some of the gas is used as fuel for compressors and other equipment, but most of it is re-injected into well fields for artificial lift and enhanced oil recovery. Producers installed wet seal compressor trains in the late 1970s to increase the pressure of the residual gas for re-injection into well fields. The systems have been in-place and operating effectively for over 40 years. Today, there are approximately 60 wet seal compressor trains in service on the ANS. In the Cook Inlet region, there are approximately six onshore wet seal compressors used to pressurize pipelines that deliver natural gas from wells and processing facilities to transportation pipelines.

All of the wet seal centrifugal compressors in Alaska are equipped with a seal oil gas separation system that separates gas from the sour seal oil exiting the compressor seal assembly, upstream from the degassing tank. Sour seal oil passes through a "seal oil trap," a type of separator, prior to routing to the seal oil degassing tank. On the ANS, the gas captured in the seal oil trap is

routed to various outlets for use as turbine fuel, low pressure fuel gas, compressor suction, flare purge, and to flare (for destruction). In the Cook Inlet region, the gas is processed for delivery to market.

Compressor trains equipped with sour seal oil traps are inherently low-emitting and capture most of the methane that otherwise would be vented from the seal oil degassing tank vents.

Figure 1 presents a basic schematic of this system at Hilcorp's Central Compression Plant (CCP). The configuration shown here is typical of the systems at the other facilities located on the ANS.

[See DCN EPA-HQ-OAR-2019-0424-0214-A1 for Figure 1: CCP Seal Oil System Overview]

Figures 2 and 3 are photographs of the seal oil traps on compressors at CCP. The traps on other compressors may look different but have the same function and set-up.

[See DCN EPA-HQ-OAR-2019-0424-0214-A1 for Figures 2 and 3: photographs of seal oil traps]

The wet seal compressor trains in use in Alaska are inherently low-emitting. In 2011, BP (operator of the Prudhoe Bay operations in 2011) and the EPA Natural Gas Star Program collaborated on a detailed evaluation of this inherently low emission wet seal system.[1] The CCP facility described above was the facility studied by EPA and BP in 2011. Data from this study confirm very low gas emissions, less than 1000 standard cubic feet per minute (scfm), from the degassing tank vents of compressors with seal oil traps.

As part of the BP-EPA Study in 2011, BP conducted emission measurements on the degassing tank vents for one high pressure (GT-1809) compressor and one low pressure (GT-1801) compressor at the CCP. These measurements were conducted using the degassing tank nitrogen purge flow as a tracer gas and the composition of the vapors in the degassing tank vent stack along with the metered volumetric rate of nitrogen purge gas to calculate emissions.

Table 1 shows the results of these measurements.

These results of the BP-EPA Study clearly illustrate the effectiveness of the sour seal oil gas separation systems on the centrifugal compressors at CCP and other facilities on the ANS. [3]

These measurements also confirm that centrifugal compressors with sour seal oil traps emit methane at significantly lower rates than EPA's estimate of 6 scfm per seal for centrifugal compressors with dry seals.[4] Please note that the emissions shown in Table 1 are for a degassing tank handling one compressor with two seals so the dry seal comparator would be 12 scfm rather than 6 scfm for a single dry seal.

AOGA respectfully urges EPA to revise the proposed rule to reflect the fact that wet seal compressor degassing systems that include sour seal oil traps, such as the systems in use in Alaska, achieve a similar level of control as dry seal compressors. AOGA asks EPA to acknowledge that this configuration is inherently low-emitting and the reporting of emissions from these units should be allowed to utilize the methods of the dry seal compressors as proposed in 40 C.F.R. 98.233(0)(2)(iii).

[See DCN EPA-HQ-OAR-2019-0424-0214-A1 for Table 1: Deassing Tank Vent Emissions[2]]

Footnotes

[1] BP and EPA Natural Gas Star Program, Centrifugal Compressor Wet Seals Seal Oil Degassing and Control (April 2012), referenced in these comments as "BP-EPA Study," available at. https://www.epa.gov/sites/default/files/2016- 04/documents/smith.pdf.

[2] See BP-EPA Study at Slide 14.

[3] The results of the BP-EPA study were documented in an EPA Natural Gas Star — Partner Reported Opportunity document, Wet Seal Degassing Recovery System for Centrifugal Compressors, available at: https://www.epa.gov/natural-gas-star-program/wet-seal-degassingrecovery-system-centrifugal-compressors. The technology was presented by BP, at EPA's request, at multiple Natural Gas Star — Technology Transfer Workshops and at the 2012 Annual Implementation Workshop, available at: https://www.epa.gov/natural-gas-starprogram/centrifugal-compressor-wet-seal-degassing. It was presented, jointly by BP and Baltimore Gas and Electric, at the 2014 Natural Gas Star - Annual Implementation Workshop, (available at: https://www.epa.gov/natural-gas-star-program/experiences-wet-seal-degassing-captureand-use) and at the 2014 Production Technology Transfer Workshops in Denver, Colorado and Park City, Utah (available at: https://www.epa.gov/natural-gas-star-program/centrifugalcompressor-wet-seal-and-seal-oil-degassing-and-recovery). In addition, at EPA's request, BP presented this technology at Global Methane Initiative (GMI) events around the world. Links to these presentations on the GMI website include the 2011 GMI Partnership-Wide Meeting, Krakow, Poland, the 2011 Turkmenistan Natural Gas STAR International Workshop, Farmington, New Mexico, and the 2012 GMI Middle East Meeting, Washington, D.C. The Climate and Clean Air Coalition — Oil and Gas Methane Partnership (OGMP) also recognizes sour seal oil gas separation and recovery technology as a mitigated technology for centrifugal compressors with wet seals. The OGMP Technical Guidance Document Number3: Centrifugal Compressors with "Wet" (Oil) Seals (2017) presents the details, available at: https://www.ccacoalition.org/en/resources/technical-guidance-document-number-3-centrifugal-compressors-%E2%80%9ICwet%E2%80%9D-oil-seals.

[4] EPA, Oil and Natural Gas Sector: Standards for Crude Oil and Natural Gas Facilities, Background Technical Support Document for the Proposed New Source Performance Standards 40 C.F.R. Part 60, subpart OOOOa at page 189 (August 2015).

Commenter Name: Not provided
Commenter Affiliation: Solar Turbines Incorporated
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0229-A1
Comment Excerpt Number: 1

Comment Excerpt: Wet seal systems can have various design criteria affecting de-gas emissions vented to atmosphere. Various OEMs and operators have designed or modified wet seal systems to recycle (*i.e.*, 'route to process') the de-gas emissions back to the compressor suction into the process gas, or into the combustion process. These types of systems may emit minimal (< 1 scfm) de-gas emissions, and in fact these emissions may not even be measurable by manual volumetric standards (*e.g.* vane anemometers, rotameters, etc.). The language in the preamble to these rule revisions stating that "wet seal degassing vents are expected to always have some natural gas flow" is not completely accurate. Therefore, screening methods should still be allowed for wet seal systems that route de-gas emissions to a certain process. If screening

methods cannot detect de-gas emissions of at least 1 scfm, such wet seal systems should be exempt from further measurement and reporting.

Commenter Name: Not provided
Commenter Affiliation: Solar Turbines Incorporated
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0229-A1
Comment Excerpt Number: 2

Comment Excerpt: With regard to wet seal systems that may have apparent de-gas emissions > 1 scfm, depending on how the de-gas emissions are routed these emissions can be mixed with air sources such as other processor utility air streams. In such circumstances when the de-gas emissions are mixed with other air sources and routed to a common vent, hydrocarbons present in the de-gas emissions will be diluted. An example of this situation is when de-gas emissions are routed to a lube oil tank and subsequently vented thru the lube oil tank vent. Lube oil tanks must be kept at a certain lower explosive limit (LEL) and so air may be routed into the tank for this purpose. When volumetric measurements are taken from the lube oil tank a grab sample of the gas should also be taken for hydrocarbon speciation since the sampled volume will likely have ambient or utility air mixed in with the de-gas emissions. In reality the bulk of the sampled volume from a lube oil tank vent may consist of mostly air and very little hydrocarbons from the de-gassing process. Without speciation, the reported hydrocarbons will likely have a very high bias, with process or utility air consisting of the majority of the volume. Language should be added to the reporting regulation to indicate that depending on the design of the wet seal de-gas system, speciation may be required to accurately obtain measurements of de-gas emissions vented to the atmosphere.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 23

Comment Excerpt: The Proposed Rule removes acoustic leak detection from screening methods allowed for manifold groups of compressor seals. INGAA believes acoustic leak detection should be allowed for manifolded compressors in some situations.

As noted in 40 CFR 98.234(a)(5), acoustic leak detection is applicable only for through-valve leakage. The acoustic method can be applied to individual compressor sources, but it cannot be applied to a vent that contains a group of manifolded compressor sources downstream from the individual valves or other streams that may be manifolded together. The inclusion of this method for manifolded compressor sources was in error and we are proposing to remove it from 40 CFR

98.233(o)(4)(ii)(D) and (E) and 40 CFR 98.233(p)(4)(ii)(D) and (E) to improve accuracy of the measurements, consistent with section II.A.2 of this preamble.

INGAA believes eliminating the use of acoustic leak detection from manifold groups of compressors is ignoring the fact that there is acoustic leak detection is a valuable tool in attributing source contribution to manifolded compressors. The acoustic device is a good tool for identifying leaks. For example, we have seen a case where a company has 4 reciprocating engines venting to a single stack (*i.e.*, manifolded compressors). A high flow meter was used to take a measurement at the common vent. There was a leak identified but and a VPAC acoustic device was used to try to isolate which unit was leaking. Three units were in standby pressurized mode, and one was in standby depressurized. In this case the acoustic detection was done upstream of where the streams were comingled.

INGAA requests EPA to continue to allow the use of acoustic leak detection in manifold compressor situations to identify which valve is leaking.

Commenter Name: William Hittie
Commenter Affiliation: INNIO Waukesha Gas Engines, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0195-A1
Comment Excerpt Number: 7

Comment Excerpt: Multiple Emission Calculation Options/Methodologies: INNIO Waukesha understands and appreciates EPA's efforts to improve flexibility for operators and estimates of methane emissions. As noted above, there can be meaningful technical and economic challenges associated with using OEM specifications and fleet stack testing to quantify methane emission from compressor engines. Without detailed testing procedures and verification protocols, it is challenging to ensure different operators are applying uniform approaches. Additionally, different methods of methane quantification may yield significantly different estimates of methane emissions, presenting challenges to directly comparing the emissions performance of companies reporting under subpart W.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 9

Comment Excerpt: Over fourteen thousand measurements conducted at transmission and storage facilities to meet Subpart W requirements were documented in PRCI reports that analyzed 2011 — 2016 data. With eleven years of data now available for analysis, EPA should

allow operators the option to use available measurements data to develop emission factors rather than requiring ongoing annual measurements.

In the 2010 Subpart W rulemaking, EPA required compressor vent measurements in sections 98.233(o) and (p) due to the lack of emissions data.[18] With tens of thousands of measurements completed since the initial 2011 reporting year, EPA should allow operators the option to use emission factors rather than continuing to mandate annual compressor vent measurements. The emission factors could be based on analysis of 2011 through 2016 measurement data in PRCI reports [19,20,21] provided to EPA and/or company specific EFs based on measurement data used to develop emission factors for "modes not measured" in any particular annual survey. For the former case, PRCI EFs could be used following the same methodology currently available to upstream sectors that apply an EF (*e.g.*, emission estimates based on unit counts and EFs). For the latter case, the Subpart W calculations used to development mode-specific emission factors based on company measurements since 2011 could be used as the basis for ongoing calculations. Subpart W uses three-year average for company-specific EFs, and companies could use either the most recent 3-year average or compile and average measurement data since 2011 as the basis for their EFs. With EFs available as an option, new measurements would no longer be mandatory.

For example, the August 2018 PRCI report compiled and analyzed over 14,000 measurements of emissions / leaks from compressor isolation valves, compressor blowdown valves, rod packing, and wet seal degassing vents. The September 2018 companion PRCI white paper presented compressor emission factors based on that Subpart measurement data compiled the PRCI report. The PRCI emissions factors could be used in conjunction with unit counts, similar to the Subpart W methods that have been used for upstream segments since 2011.

Footnotes

[18] 76 FR 18620. Proposed rule (April 12, 2010) preamble discussion — *e.g.*, direct measurement required because, "no credible engineering estimation methods or emissions factors exist."

[19] PRCI Report Catalog No. PR-312-16202-R02, "GHG Emission Factor Development for Natural Gas Compressors," April 2018.

[20] PRCI White Paper, Catalog No. PR-312-18209-E01, "Methane Emission Factors for Compressors in Natural Gas Transmission and Underground Storage based on Subpart W Measurement Data," September 2019.

[21] PRCI Report Catalog No. PR-312-16202-R03, "Methane Emissions from Transmission and Storage Subpart W Sources," August 2019.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 10

Comment Excerpt: Subpart W already includes calculation methods for developing company-specific estimates based on the company's measurements. Annual measurements are completed "as found," so every source and operating mode (*i.e.*, operating, standby pressurized, and not operating depressurized) is not measured every year. Sections 98.233(o) and (p) require operators to calculate compressor emission factors for modes where measurements are not completed based on previous company measurements. If ongoing measurement is eliminated or optional, ongoing estimates could be completed using those same methods based on the available data.

The measurement dataset available industry-wide or at a company-level has resolved the data deficiency EPA identified over a decade ago. In addition, the GHGRP rarely requires direct measurements for other industries, and this disparity for T&S sources under Subpart W should not continue. EPA should no longer require this additional measurement burden and, instead, should allow the T&S sources the option to calculate emissions using emission factors rather than mandated annual measurements. INGAA offers its assistance to work with EPA to develop Subpart W regulatory text to achieve this objective.

Extensive data collected over more than a decade allows for the development of emission factors that characterize T&S operations. Accordingly, EPA should allow operators to use available emission factors — based on industry-wide or company-specific measurement data — rather than continuing to require ongoing annual leak measurements and leak surveys at T&S facilities.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 58

Comment Excerpt: We urge EPA to account for vented methane emissions from engine crank cases in the GHGRP. These emissions are not currently reported anywhere in the GHGRP. Data from Johnson et al. (2015) suggests that these emissions can be significant, finding that the average ratio of crankcase-to-exhaust emission was 14.4%.[135] The measurements are illustrated in the table below.

Table 5. Comparison of Combined Exhaust and Crankcase (CC) Methane Emissions Rates with Those Predicted by AP-42.

site	CC/exhaust (%)	exhaust + CC (kg/hr)	AP-42 (kg/hr)	percent difference
1	8	13.3	13.4	-1
2	4	6.0	4.4	38
3	22	13.1	13.6	-4

4	12	3.4	5.8	-41
	13	3.6	5.8	-39
	7	4.5	5.8	-22

While this may be a difficult source to measure, given the significance of these total emissions we support EPA requiring operators to account for emissions from engine crank cases. This can be done either by requiring direct measurement, or by developing emission factors based on the available literature. EPA can rely on the published data from Johnson et al. (2015) to estimate the emission factor.[136] In addition, once this source is quantified and tracked by the EPA, it will incentivize researchers to work to conduct additional measurements to improve the precision of these factors.

Footnotes

[135] Johnson et al., Methane Emissions from Leak and Loss Audits of Natural Gas Compressor Stations and Storage Facilities, 49 Env. Sci. Tech., 8132-8138 (2015), https://pubs.acs.org/doi/pdf/10.1021/es506163m.

[136] Id.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 16

Comment Excerpt: We also call on EPA to account for vented methane emissions from engine crank cases in the GHGRP. These emissions are not currently reported anywhere in the GHGRP. Data from Johnson et al. (2015) suggests that these emissions can be significant, finding that the average ratio of crankcase-to-exhaust emission was 14.4%.68 The measurements are illustrated in Table 6.

Table 6. Comparison of Combined Exhaust and Crankcase (CC) Methane Emissions Rates with Those Predicted by AP-42. Reproduced from Johnson et al. (2015).

site	CC/exhaust (%)	exhaust + CC (kg/hr)	AP-42 (kg/hr)	percent difference
1	8	13.3	13.4	-1
2	4	6.0	4.4	38
3	22	13.1	13.6	-4
4	12	3.4	5.8	-41
	13	3.6	5.8	-39

	7	4.5	5.8	-22

While this may be a difficult source to measure, given the significance of these total emissions we support EPA requiring operators to account for emissions from engine crank cases, either by requiring direct measurement, or by developing emission factors based on the available literature. EPA can rely on the published data from Johnson et al. (2015) to estimate the emission factor. In addition, once this source is quantified and tracked by the EPA, it will incentivize researchers to work to conduct additional measurements to improve the precision of these factors.

A-13. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for equipment leak surveys

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 13

Comment Excerpt: We support EPA's proposal to amend the leaker emission factors in Table W–1E for production and gathering and boosting facilities to include separate emission factors for leakers detected with OGI. The emission factors developed by combining the data from Zimmerle et al. (2020) and Pacsi et al. (2019) are an improvement from the outdated factors currently being used, but still do not account for large, intermittent emissions. We also agree that using the same leaker emission factor for components detected with OGI and Method 21 with a leak definition of 10,000 ppm, as is currently done in subpart W, likely understates the emissions from leakers detected with OGI. We therefore support a requirement to use OGI leaker emission factors to quantify the emissions from the leaks identified using other monitoring methods.

We also support EPA's proposal to apply the "OGI enhancement" factor identified from measurement study data in the onshore production and gathering and boosting industry segments to the leaker emission factors for the other subpart W industry segments as a means to estimate an OGI emission factor set. EPA's rationales for proposing these factors for the production segment apply equally to other segments and EPA's proposal to apply the enhancement factor is therefore reasonable and will lead to more accurate estimates.

We strongly support the alternative proposed option that would allow reporters to quantify emissions from equipment leak components by performing direct measurement of equipment leaks and calculating emissions using those measurement results. It is important, as EPA has recognized, that reporters using this option quantify and report all leaks identified during a facility-wide "complete leak detection survey." Otherwise, reporters could not use leaker emission factors for some leaks and quantify other leaks identified during the same leak detection survey, leading to selective and non-representative reporting. However, it is not necessary for operators to measure all leaks at an onshore production facility as proposed. Instead, they should measure a statistically robust subset of representative leaks, following protocols set forth by EPA. If operators use this approach, they must measure all leaks at surveyed sites to avoid selective measurements. Some leaks will be too large to measure with

component-level approaches, but reporters should first try to measure with other approaches like site-level measurements, or as a last resort, estimate with engineering calculations. Operators should report the detailed data to EPA, and EPA would then analyze the data to improve emission factors and publicly release an anonymized, aggregated dataset.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 11

Comment Excerpt: AIPRO generally supports the proposed option to quantify leak rates via approved methods, as an alternative to using "one-size fits all" emissions factors. That said, AIPRO proposes that the agency allow all available and proven reliable alternatives for doing so. Further, AIPRO encourages the agency to allow the same alternative for quantifying actual vent rates and leak rates for pneumatic devices.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 13

Comment Excerpt: Range supports EPA allowing direct measurement as an alternative method of estimating equipment leaks, but the Agency should allow operators to measure and report based on representative average leak volumes, rather than actual volumes from every leak.

The Proposed Rule allows for the direct measurement of leak emissions as on option for quantifying reportable leak emissions. 87 Fed. Reg. at 37068. Range believes this is an appropriate approach to quantifying leak emissions. The Proposed Rule excludes some common sense and efficient methods of quantifying leak emissions, however, which should be added to the allowable methods in Subpart W.

Specifically, EPA should allow operators to perform a statistically significant sampling of emissions of different types of leaking components and develop appropriate and representative leak emissions factors to be used in calculating reportable leak emissions—as opposed to calculating the actual emissions for every leak. This methodology will maintain reliable data while providing operators with an economical and efficient manner of calculating emissions from leaks. In fact, EPA utilizes average emissions factors for certain types of emissions, such as those from pneumatic devices. Since EPA has acknowledged that average emissions rates serve

as a reliable method of calculating reportable emissions, EPA would simply be adopting a similar approach here.

Once an operator has developed a statistically representative sampling (whether over a shorter period of time or a longer historical period), the operator should be able to use reliable, average emissions data while under similar operating conditions. EPA should allow operators to use this type of data in developing their reportable emissions and, at least, seek information from operators on the data that they can or do collect using this methodology to support the use of this data in the future.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 50

Comment Excerpt: We support EPA's proposal to amend the leaker emission factors in Table W–1E for production and gathering and boosting facilities to include separate emission factors for leakers detected with OGI. EPA's proposed emission factors were developed by combining the data from Zimmerle et al. (2020) and Pacsi et al. (2019), and represent an improvement from the outdated factors currently being used. We also agree that using the same leaker emission factor for components detected with OGI and Method 21 with a leak definition of 10,000 ppm, as is currently done in subpart W, likely understates the emissions from leakers detected with OGI. We therefore support a requirement to use OGI leaker emission factors to quantify the emissions from the leaks identified using other monitoring methods.

We also support EPA's proposal to apply the "OGI enhancement" factor identified from measurement study data in the onshore production and gathering and boosting industry segments to the leaker emission factors for the other subpart W industry segments as a means to estimate an OGI emission factor set. EPA's rationales for proposing these factors for the production segment apply equally to other segments, and EPA's proposal to apply the enhancement factor is therefore reasonable and will lead to more accurate estimates.

EDF strongly supports the alternative proposed option that would allow reporters to quantify emissions from equipment leak components by performing direct measurement of equipment leaks and calculating emissions using those measurement results.[121] It is important, as EPA has recognized, that reporters using this option quantify and report all leaks identified during a "complete leak detection survey." Otherwise, reporters could use leaker emission factors for some leaks and quantify other leaks identified during the same leak detection survey, leading to selective and non-representative reporting. However, it is not necessary for operators to measure all leaks at an onshore production facility as proposed. Instead they should measure a statistically robust subset of representative leaks, following protocols set forth by EPA. If operators use this approach, they must measure all leaks at surveyed sites to avoid selective measurements. Some

leaks will be too large to measure with component-level approaches, but reporters should first try to measure with other approaches like site-level measurements, or as a last resort, estimate with engineering calculations. Operators should report the detailed data to EPA, and EPA would then analyze the data to improve emission factors and publicly release an anonymized, aggregated dataset.

Footnotes

[121] 86 Fed. Reg. at 36,976-77.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 1

Comment Excerpt: The creation of the OGI enhancement factor and the adjustment to leaker emission factors is not reasonable and is not based on technical data supporting applicability to sources downstream of the onshore production and gathering and boosting facilities. These changes are not justified and not supported by the record.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 2

Comment Excerpt: The proposed revisions to leaker emission factors are based on studies for optical gas imaging (OGI) at onshore production and gathering and boosting facilities and are not relevant to downstream sources. The creation of the OGI enhancement factor is not reasonable and is not based on technical data supporting applicability to sources downstream of the onshore production and gathering and boosting facilities. EPA should consider additional perspective studies and data gathered using OGI and other leak testing methods in other segments of the natural gas supply chain. These proposed changes are not justified and are not supported by the record.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA has not conducted studies or relied upon study data in any of the downstream industry segments to support the applicability of the proposed leaker emission factors based on the OGI enhancement factor for use in these industry segments. Duke Energy uses infrared laser beam instruments extensively within our Piedmont Natural Gas business units because this method has proven reliable and efficient for conducting the required annual leak testing on a combined system that includes over 1,000 transmission-distribution (T-D) transfer stations that must be tested. The use of the proposed leak factors will result in reported significant increase in methane emissions despite no change in actual operation of these facilities and even though EPA acknowledges "there are no data available" to support the revised calculations. The effect may be to force facilities to move exclusively to Method 21 testing, which would be much more labor-intensive and not suitable for conducting numerous tests over a large natural gas distribution network.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 15

Comment Excerpt: EPA should not revise leaker emission factors found from OGI surveys. TPA is opposed to the "OGI enhancement" factor being proposed in this rulemaking.[14] The record is devoid of any valid scientific or technical basis for this proposal, which would have a significant impact on the many facilities that use OGI screening rather than Method 21. It appears that EPA's sole justification for this proposal is its conclusion that OGI screening finds fewer and larger leaks than Method 21. [15] Yet EPA can point to no scientific study that actually supports this conclusion, and in fact EPA has chosen to disregard the one study that comes closes to reporting actual comparisons between the results reached through Method 21 with those reached through use of OGI screening, the City of Fort Worth Natural Gas Air Quality Study (ERG and Sage, 2011).[16] Prior EPA rules and analyses, including those forming the basis for NSPS rules and the proposed EPA methane rules for the oil and natural gas industry, have consistently supported the accuracy and use of OGI monitoring and have not suggested that it suffers from fundamental flaws as is now being suggested in this rulemaking. It would be a dramatic departure from prior practice for EPA to now call into question the reliability of OGI screening results and, on the basis of a record that is devoid of conclusive findings, adjust the leaker emission factors for OGI screening as is being proposed. Accordingly, we oppose finalization of the proposed "OGI enhancement" factor.

Footnotes

[14] 87 Fed. Reg. 36976 (June 21, 2022).

[15] Id.

[16] See EPA-HQ-2019-0424-0120, Memorandum from Mark de Figueiredo and Stephanie Bogle, EPA/CCD, January 2022, Greenhouse Gas Reporting Rule: Technical Support for Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule; Proposed Rule—Petroleum and Natural Gas Systems, at 33-35.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 13
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: EPA has not explained the rationale for proposed revisions to leaker emission factors for approaches other than Method 21. The rationale provided only suggests that alternative leaker emission factors may be warranted when using OGI for detection or other comparable approaches because they are based on OGI studies. Application of these factors to other sources via an "OGI enhancement" factor is not supported by published data nor by EPA's mathematical approach. EPA should maintain the current approach for other sources and not pursue the use of the proposed "OGI enhancement" factor until such time as the "OGI enhancement" factor is verified by study.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 6

Comment Excerpt: A high-level review of data from upstream studies does not support a 4.1 multiplier.

EPA has concluded that the "multiplier" for upstream emission factors is due to the leak detection method (*i.e.*, Method 21 versus OGI leak screening), but there are other significant factors that must be considered. For example, the more recent OGI data reviewed by EPA has a prevalence of different components when compared to the historical leaker EFs for upstream segments.

EPA calculated the 4.1 multiplier by dividing emission factors developed from two recent leak emissions quantification studies (Zimmerle[14] and Pasci[15]) and the current Table W–1E leaker emission factors based on the Method 21 10,000 ppm leak definition. EPA then proposes to

apply the 4.1 multiplier to current Subpart W Method 21 10,000 ppm leaker emission factors for natural gas transmission and storage, and LNG facilities to develop emission factors that would apply to leaking components found during leak surveys conducted using OGI. One of many EPA conclusions is that the differences for the upstream segments are due solely to the detection method. However, that may not be the case, because it appears different equipment categories are represented. Over 80% of the gas-service components surveyed and measured for the Zimmerle and Pasci studies were at gathering and boosting facilities or otherwise in compressor-service (*i.e.*, all 180 facilities in the Zimmerle study were gathering and boosting and about 40% of the components surveyed at 67 facilities for the Pasci study were at gathering and boosting facilities or otherwise in compressor-service).

The Subpart W TSD Memo does not demonstrate that this prevalence of compressor components surveyed for the Zimmerle and Pasci studies is representative of the components for the onshore natural gas production and gathering and boosting industry segments, where there are many components associated with the wellhead and non-compressor components in proximity. It is likely that the newly proposed (OGI) Table W–1E emission factors are significantly higher than the current Table W–1E emission factors because the new emission factors are based on measurements that over-represent compressor components.

For the transmission segment, EPA has already addressed this issue by publishing different emissions factors for compressor and non-compressor service. Compressors are subject to vibration and thermal cycling and thus EFs are greater than non-compressor components in Table W–3A; for example, the average "compressor component emission factor / non compressor component emission factor" ratio for T&S in Subpart W is about 5.4. The fact that EPA has accounted for this characteristic for transmission compressor station leak EFs is cause enough to conclude that the 4.1 multiplier proposed by EPA is not appropriate.

Footnotes

[14] Zimmerle, D., K. Bennett, T. Vaughn, B. Luck, T. Lauderdale, K. Keen, M. Harrison, A. Marchese, L. Williams, and D. Allen. 2019. Characterization of Methane Emissions from Gathering Compressor Stations: Final Report. Prepared for the U.S. Department of Energy under Contract No. DE-FE0029068. October 2019 Revision.

[15] Pacsi, A. P., T. Ferrara, K. Schwan, P. Tupper, M. Lev-On, R. Smith, and K. Ritter. 2019. "Equipment leak detection and quantification at 67 oil and gas sites in the Western United States." Elementa: Science of the Anthropocene, 7:29.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 26

Comment Excerpt: The required (and allowable) leak measurement methods are extremely difficult to discern in the rule text (98.233(j)(1) and all its cross-references). EPA should include

a table in the rule to show which methods are required and/or allowable for each industry segment.

EPA is proposing many emissions factor changes in the table to Subpart W with inconsistent levels of precision. Rounding has been applied inconsistently to the emission factors. For example, in Table W-1E, the leaker emission factor for valves (if surveyed using any of the methods in § 98.234(a)(1), (3), or (5)) is listed as 16 scf/hr/component. Based on the technical support document, this factor should be 15.6 scf/hr/device. There are emission factors at this level of precision within the same table; for example, 7.9 scf/hour/component is used for connector (other). EPA should maintain consistency on decimal precision of emission factors, especially within the same table, unless the underlying data truly supports different levels of precision.

EPA is proposing to separate leaker emission factors based on the survey technique: (1) Method 21 > 10,000 pm (2) Method 21 > 500 ppm and (3) OGI/IR/Acoustic. GPA finds many of EPA's conclusions regarding the addition of leaker emission factors for survey methods other than Method 21 troubling. First, EPA chose to ignore results from two of the four recent studies for equipment leak emissions based on a weak rationale. EPA disregarded the 2011 Fort Worth Study primarily because it was geographically limited and utilized the Bacharach Hi-Flow Sampler. EPA also ignored the 2013 Allen Study because it utilized the Bacharach Hi-Flow Sampler. Geographic constraints should have no bearing on the validity of data, and the Bacharach Hi-Flow Sampler is widely used for measurement of methane emissions. There is no known rationale for assuming the Bacharach Hi-Flow Sampler results are invalid. The equipment was not discontinued by the manufacturer due to issues in its performance, but because it was no longer profitable for them to manufacturer. As EPA notes in the Technical Support Document, Bacharach is the sole manufacturer of a commercial high flow sampler. Furthermore, EPA was comfortable in using the 2020 Zimmerle Study results even though the study utilized a "redesigned" high-flow sampler fabricated with Bacharach parts by Colorado State University and SLR Consulting that has not undergone extensive testing to validate its accuracy. It makes no sense to disregard one study for use of a commercial high flow sampler, but use a study based on a piece of equipment designed as part of collegiate research. In doing so, EPA appears to be cherry-picking scientific studies to justify revision of emission factors. EPA also states that "these studies showed that OGI finds fewer yet larger leaks than EPA's Method 21. Therefore, the application of the same leaker emission factor to leaking components detected with OGI and Method 21 with a leak definition of 10,000 ppm, as is currently done in Subpart W, underestimates the emissions from leakers detected with OGI." GPA disagrees with this conclusion, as the only study to compare OGI with Method 21 was the 2011 Forth Worth Study, which has been disregarded. Furthermore, the 2020 Zimmerle study focused on OGI camera operator bias and not technological capabilities. EPA is also ignoring years of technical support justification for the use of OGI in lieu of Method 21 at 10,000 ppm that has been used in promulgating NSPS OOOOa and other Alternative Work Practices, including in the recently proposed OOOOb/c, where EPA states, "our analysis shows that the proposed standards, which use OGI, achieve equivalent reduction of VOC and methane emissions as the current standards, which are based on EPA Method 21, but at a lower cost." Absent any new comprehensive studies comparing technological capabilities of OGI and Method 21 simultaneously at facilities, GPA believes that the justification of revised leaker emission factors is flawed. At minimum, based on previous technical support documentation, the leaker emission factors for OGI should be the

same as Method 21 at 10,000 ppm. EPA should also consider how to incorporate emerging technology that supports quantification of leaks detected by imaging.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 5

Comment Excerpt: For OGI-based leak surveys, the analysis for the T&S sector using data from upstream sectors is not representative of T&S operations and T&S leaker emission factors (EFs) should not be revised.

The Proposed Rule would add new emission factors for estimating equipment leak (leaker) emissions when using an alternative method to Method 21, including the OGI camera. The OGI Alternative method leaker EFs are approximately 4 times higher and based on an EPA technical support memorandum ("Subpart W TSD Memo") that analyzes emission factors for operations in upstream segments — *i.e.*, onshore production and gathering and boosting. For leak surveys using the OGI camera (and other methods in section 98.234(a) other than Method 21), EPA developed an "OGI enhancement factor." The OGI enhancement factor, a 4.1 multiplier, is based on EPA analysis of upstream data. EPA then applies that factor to T&S (and other sector) leak emission factors based on Method 21 leak detection. However, EPA failed to acknowledge that current leaker EFs for the "downstream" segments are already significantly higher than the analogous EF for upstream segments. The current T&S EFs are higher because the T&S EFs are based on more robust datasets from studies[11, 12, 13] that included direct measurement of leaks, while the current upstream segment EFs are based on studies that applied "correlation equations" to estimate leak rates.

INGAA strongly opposes EPA's proposed approach to adjust transmission, storage, and LNG leak EFs for OGI due to several factors:

- EPA has not provided a sound technical basis for its conclusion that an OGI enhancement factor based on studies of different segments using different study design and different methodological approaches should apply to T&S leaker emission factors.
- The differences for the upstream sector are likely due, at least in part, to the equipment/ components surveyed (*e.g.*, production well pad versus gathering compression) and not solely due to the different detection methods. EPA has already accounted for compression versus non-compression service components for transmission compressor stations.
- The leak rates implied by the proposed factors for transmission OGI leak EFs are very large and inconsistent with OGI detection thresholds. The T&S leak EFs are

based on different studies and more detailed methods (*e.g.*, direct leak rate measurement) than the historical EFs for upstream sources.

- Significant disparities (*i.e.*, significant under-estimation) in leak emission estimates for T&S sources is not supported by recent studies of this segment.

EPA has not provided adequate justification or support to apply the OGI enhancement factor to T&S and LNG leaker emission factors. The current leaker EFs should be retained since it is inappropriate to apply an "enhancement" based on analysis of data from a different segment that includes significant disparities in both study design (*e.g.*, direct measurement versus correlation equation-based emission estimates) and operational equipment. In fact, the Subpart W_TSD Memo does not provide any T&S data to support its conclusion or the proposed revision.

The Subpart W TSD Memo states:

> "...our analysis of measurement study data from onshore production and gathering and boosting facilities demonstrates the need for separate OGI leaker emission factors to more accurately account for emissions. We expect [emphasis added| that the leaker factors for other industry segments that are based on measurements of Method 21-identified leaks may [emphasis added] similarly underestimate the emissions from leaking equipment when OGI (or other alternative methods besides Method 21) are used to detect the leaks."

An unsupported "expectation" that upstream segment emissions measurement data "may" similarly impact T&S is not sound justification for applying the 4.1 multiplier to T&S emission factors. Discussion of additional technical issues that raise questions about data applicability to T&S follows.

Footnotes

[11] Clearstone (Clearstone Engineering Ltd.). 2002. /dentification and Evaluation of Opportunities to Reduce Methane Losses at Four Gas Processing Plants. Prepared for Gas Technology Institute under USEPA Grant No. 827754-01-0. June 20, 2002.

[12] NGML (National Gas Machinery Laboratory, An Institute of Kansas State University), Clearstone Engineering Ltd and Innovative Environmental Solutions, Inc. 2006. Cost-Effective Directed Inspection and Maintenance Control Opportunities at Five Gas Processing Plants and Upstream Gathering Compressor Stations and Well Sites.

[13] Clearstone (Clearstone Engineering Ltd.). 2007. Fugitive Emissions Pilot Project: Measurement of Natural Gas Emissions from the Canadian Natural Gas Transmission and Distribution Industry. Prepared for Canadian Energy Partnership for Environmental Innovation (CEPEI). April 16, 2007.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 7

Comment Excerpt: Large leaks of the magnitude of the proposed T&S emission factors would be readily detected. The proposed leaking component emission factors for T&S are very large (*e.g.*, 163 scfh for PRVs, 79 scfh for meters, 71 scfh for OEL, and 61 scfh for valves). This equates to over one kg/hr in all cases, which is several orders of magnitude higher than OGI methane leak detection thresholds.[16] Since EFs are averages of all measurements (*i.e.*, total emissions divided by number of measurements), these emission factors infer that only very large leaks, with emissions rates orders of magnitude higher than established (or work practice required) detection limits, are all that is detected by OGI at T&S facilities. INGAA is not aware of any study or EPA analysis that supports this conclusion.

Similarly, the EPA 4.1 multiplier presumes the "frequency" of leaks detected by Method 21 that are missed by EPA. Leak EFs are based on study data that divides total emissions (measured or estimated emissions, by component type) by the number of leaking components ("N"). Example calculations can be performed that define the number, N, of OGI missed leaks that are required to result in a 4.1 multiplier, and N is dependent on the total emissions not found (*e.g.*, assume 10 to 30% of the total emissions are due to the leaks missed with OGI). This exercise indicates that OGI would need to miss the vast majority of leaks (*e.g.*, on the order of 70% or more leaks would be missed with OGI, or OGI would detect only 1 in 3 to 1 in 4 leaks compared to leaks detected with Method 21 at 10,000 ppm screening threshold) which is not supported based on current understanding of leak detection methods (*e.g.*, for gathering and boosting, Pasci found approximately 30% more (small) leaks with Method 21).

Footnotes

[16] EPA alternative work practice criteria, proposed Appendix K requirements, and OGI vendor publications document detection thresholds significantly less than 100 g/hr.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 8

Comment Excerpt: It is important to understand that the technical basis for the leaker EFs that apply in the existing regulation is very different, depending upon the segment. As noted in the EPA support memo, upstream EFs used estimation methods (*e.g.*, correlation equations) following the EPA "Leak Protocol" document. In contrast, T&S EFs are based on robust data sets from studies that conducted direct measurement of leaks (*e.g.*, with High Volume Sampling System). Because a more thorough and complete T&S dataset is available, the historical EFs for T&S are significantly higher than EFs for upstream segments. Recent studies for T&S [17] that include OGI leak surveys indicate that current methodologies provide a reasonably accurate estimate of facility emissions. The cited study was funded cooperatively by T&S companies and the Environmental Defense Fund and concluded that T&S emissions are not under-estimated (see Figure 4 of the study), and that transmission fugitive (*i.e.*, leak) emissions are not under-

estimated. The EPA proposed change would increase those emissions by a factor of 4, which contradicts data from the T&S sector.

In conclusion, EPA should not update leak EFs in the Proposed Rule using data from studies that use different methodologies to correlate leaker EFs for segments that are not represented in the studies. EPA should also consider other factors (*e.g.*, differences in component types surveyed, measured versus inferred emission estimates) rather than concluding detection methods are the sole reason for differences between studies. EPA's approach leads to flawed conclusions, and it is not appropriate to apply the "correction factor" from upstream studies to EFs in downstream sectors. The current Subpart W EFs for transmission, storage, and LNG facilities are supported by existing studies, including data specific to those segments, and should be retained and not updated.

Footnotes

[17] "Methane Emissions from the Natural Gas Transmission and Storage System in the United States," Zimmerle, et.al., Environmental Science and Technology, July 2015 (*e.g.*, see Figure 4 and Figure 5).

Commenter Name: Curtis J. Winner
Commenter Affiliation: New Mexico Gas Company (NMGC)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0203-A1
Comment Excerpt Number: 6

Comment Excerpt: EPA proposes to apply larger leaker emission factors for onshore production and natural gas gathering and boosting where optical gas imaging (OGI) is used to detect leaks, based on upstream studies with the OGI. In addition, EPA proposes to apply these larger OGI leaker emission factors to all downstream sectors, including distribution T-D components, based on the assumption that the upstream data is equally applicable downstream. We agree for the reasons given in INGAA's comments that this is not the case for downstream sectors including natural gas transmission, underground storage, LNG storage, LNG import - export facilities — or distribution T-Ds. NMGC urges EPA not to add OGI enhanced leaker emission factors to Table W–7 for T-D components.

Additionally, the header for Table W–7 in the proposed rule is "DEFAULT TOTAL HYDROCARBON LEAKER EMISSION FACTORS FOR ONSHORE NATURAL GAS PROCESSING" while the header of the table says "Transmission-Distribution Transfer Station components."

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 17

Comment Excerpt: EPA proposes to apply larger leaker emission factors for onshore production and natural gas gathering and boosting where optical gas imaging ("OGI'") is used to detect leaks, based on upstream studies finding OGI "identifies fewer yet larger leaks than the EPA's Method 21."[29] In addition, EPA proposes to apply these larger OGI leaker emission factors to all downstream sectors, including distribution T-D components, based on the assumption that the upstream data is equally applicable downstream. The Associations agree for the reasons given in INGAA's comments that this is not the case for downstream sectors including natural gas transmission, underground storage, LNG storage, LNG import -export facilities or distribution T-Ds. The Associations urge EPA not to add OGI enhanced leaker emission factors to Table W–7 for T-D components. Moreover, Table W–7 is labeled incorrectly and should refer to leaker emission factors for gas distribution.

Footnotes

[29] 87 Fed. Reg. at 36976 (preamble), 37105 (proposed revised Table W–7).

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 10

Comment Excerpt: AIPRO objects to the "multiple" studies referenced as the basis for proposed revisions which would: 1) establish different leaker emissions factors in Table W–1E for leaks detected via methods other than Method 21, compared to those that are detected with Method 21, and 2) add the requirement to use an "OGI Enhancement" factor for surveys in other segments required to report under Subpart W besides "production" and "boosting & gathering." The studies are not representative of all operations required to calculate and report GHG emissions under Subpart W and would arbitrarily cause emissions to be higher for leaks detected with the most commonly used approved technique, OGI leak surveys in accordance with NSPS OOOOa.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA revises the current leaker emission factors for surveys using OGI, infrared, or other acoustic measurements by applying an "OGI enhancement" factor, a ratio of the OGI emission factor and the Method 21 emission factor (which has a value of 4.1) from the study data from onshore production and gathering and boosting facilities. The OGI enhancement factor is then added to the leaker factors for the other Subpart W industry segments even though EPA has not provided any factual record for making this change. Because EPA has not conducted an evaluation of testing methods beyond the upstream onshore production and gathering and boosting industry segments or for testing methods besides OGI, applying this 4.1 multiplier to other industry segments is not reasonable or scientific. EPA cannot propose a change of this significance simply because EPA "expects" other industry segments might also have higher emissions. EPA should conduct additional perspective studies and data gathering using OGI and other methods besides Method 21 in other industry segments before making such changes.

Duke Energy is concerned that EPA's reasoning would impede progress on adoption of new advanced methane technologies that also do not rely on Method 21 testing of each component. If EPA does adopt these new, higher leaker emissions factors, it should not eliminate the current provision that allows facility to verify any leaks detected to conduct a second test using Method 21.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 36

Comment Excerpt: For Onshore Natural Gas Processing, Onshore Natural Gas Transmission Compression, and Underground Natural Gas Storage, EPA is proposing new leaker emission factors for OGI that are 4.1 times higher than the current emission factors (Tables W–2A, W–3A, W–4A).

These new emission factors are not based on actual study data for processing, transmission, or underground storage. EPA calculated ratios between the current and proposed emission factors for Production and G&B (Table W–1E). The average of these ratios (4.1) was multiplied by the current processing/transmission/underground storage emission factors to arrive at the proposed emission factors. This is inappropriate. EPA did not present information to support changing the leaker emission factors for processing, transmission, or underground storage. EPA did not reference any information to indicate that the current processing, transmission, and underground storage emission factors are not representative of actual emissions. EPA did not reference any information to support that it is appropriate to apply the magnitude of change between the current versus proposed emission factors for production and G&B to the emission factors for processing, transmission, and underground storage. If EPA can justify applying production and G&B studies to processing, transmission, and underground storage, then EPA should instead

update Tables W–2A, W–3A, and W–4A to have the same OGI leaker emission factors as Table W–1E.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 9

Comment Excerpt: The Proposed Rule significantly increases emission factors for equipment leaks in all industry segments (Production, Gathering and Boosting, Processing, and Transmission and Storage). The largest increase is found in the Gathering and Boosting industry segment. For the Gathering and Boosting segment, EPA should consider all research studies regarding equipment leaks when developing updated emissions factors. Furthermore, for the Processing and Transmission and Storage segments, EPA appears to have made assumptions regarding emissions from equipment leaks and inappropriately applied equipment leak data from the Production and Gathering and Boosting segments. EPA will need to address these issues before finalizing the new emission factors.

Commenter Name: Douglas Jordan
Commenter Affiliation: Western Midstream Partners, LP
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0202-A1
Comment Excerpt Number: 6

Comment Excerpt: Some of the proposed rule elements that we oppose include the following items which are further detailed in the comments WES has endorsed (American Petroleum Institute, Gas Processors Midstream Association, and Texas Pipeline Association):

Significantly higher component/equipment leak emissions factor when conducting leak surveys with Optical Gas Imaging cameras.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 12

Comment Excerpt: EPA has proposed new default emissions volumes for equipment leaks that will require reporters to grossly overstate the actual emissions caused by leaks.

EPA proposes new "Leaker Emission Factors" for components listed in Tables W–1A through W–7. 87 Fed. Reg. at 37101-37105. Based on Range's experience with detecting and calculating the volume of emissions from leaks, the proposed Leaker Emission Factors grossly overstate the volume of emissions from equipment leaks. In some cases, EPA proposes increasing the Leaker Emission Factor by two or three times the current factor, without adequate explanation or technical justification.

This problem is particularly acute where operators perform leak detection using optical gas imaging ("OGI"). Operators utilizing OGI to detect leaks can estimate emissions volumes, or at least determine that emissions are much less (or greater) than the established Leaker Emission Factor. 3. Accordingly, EPA should remove the newly proposed Leaker Emission Factors before publishing the final rule.

Commenter Name: Ryan Streams
Commenter Affiliation: Kairos Aerospace (Kairos)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0176-A1
Comment Excerpt Number: 1

Comment Excerpt: The first flaw in the proposed amendments is that EPA clearly recognizes that traditional leak detection methods like EPA Method 21 underestimate total emissions, particularly the contribution of larger leaks, yet EPA relies on OGI to update its leak estimates, which suffers from similar emission estimation flaws as EPA Method 21. As the proposed rule itself notes, "These studies [Zimmerle et al. 2020 and Pasci et al. 2019] found that optical gas imaging (OGI) identifies fewer yet larger leaks than the EPA's Method 21. Specifically, the average leaker emission factor determined from OGI leak detection surveys is often a factor of two or more larger than leaker emission factors determined when using Method 21 leak detection surveys."

We agree with the conclusion that Method 21 is unsuitable for accurately estimating emissions at a large scale, particularly large emission sources. However, as Zimmerle et al. noted in another 2020 study, OGI is more effective than EPA Method 21, but it is far from perfect. That second Zimmerle et al. study[3] found a wide range in the effectiveness of OGI as a leak detection method, with highly variable detection rates based on individual camera operator skill. The study found "[t]he leak size required to achieve a 90% probability-of-detection in this study is an order-of-magnitude larger than prior studies." The study also found that highly experienced OGI operators identify nearly twice as many leaks as less experienced operators. Given that the detection limit of OGI is worse than previously understood and that camera operator skill also impacts the results from OGI surveys, combined with the fact that OGI does not reliably quantify leaks, it seems a highly problematic foundation upon which to build a GHG inventory estimate.

We're concerned that while EPA acknowledges the limitations that plague EPA Method 21, it instead relies on a similarly problematic technology in OGI.

Airborne quantification techniques have thoroughly demonstrated that OGI is at best a flawed technique to quantify methane emissions and is better suited as a qualitative tool to pinpoint component-level leaks rather than establish site-level (let alone basin-level or industry sector-level emission estimates). Numerous recent studies using advanced measurement techniques have found significant discrepancies between measured emissions and reported GHG emissions calculated with emission factor-based methods. One such example is an analysis by Rutherford et al.[4] The study found that field measurements of methane emissions are 1.5 to 2 times greater compared to official GHG inventory (GHGI) estimates based on emissions factors, and that certain industry segments have larger discrepancies than others. As the study authors note, this discrepancy may be in part because the emission factors that underpin the GHGI instruments are in some cases based on 30-year-old, outdated information.

Another example from Chen et al. revealed that actual methane emissions from the Permian Basin are perhaps six times higher than GHGI estimates, based on a large-scale measurement campaign that relied on hundreds of thousands of aircraft-based site measurements.[5] Yet another example from Zavala-Araiza et al. found discrepancies between measurement-based calculations of emission intensities and emissions factor-based calculations.[6] As those study authors point out, the discrepancies between measured GHG emissions and emissions factor-based estimates have serious consequences. The authors note these discrepancies "lead to conflicting claims about the climate implications of fuel switching from coal or petroleum to natural gas."

Footnotes

[3] "Detection Limits of Optical Gas Imaging for Natural Gas Leak Detection in Realistic Controlled Conditions," Zimmerle et al. 2020 https://pubs.acs.org/doi/10.1021/acs.est.0c01285

[4] "Closing the methane gap in US oil and natural gas production emissions inventories," Rutherford et al. 2021 https://www.nature.com/articles/s41467-021-25017-4

[5] Chen et al. 2022

[6] "Reconciling divergent estimates of oil and gas methane emissions," Zavala-Araiza et al. 2019 https://www.pnas.org/doi/full/10.1073/pnas.1522126112

Commenter Name: Ryan Streams
Commenter Affiliation: Kairos Aerospace (Kairos)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0176-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA's continued reliance on OGI leak data to update its "leaker factor" within the inventory will not solve this discrepancy. Much like EPA Method 21, OGI has shown significant limitations in its ability to identify and quantify large sources of methane. For example, another study using Bridger Photonics' airborne methane measurement system identified 18 times more methane emissions from sites compared to OGI survey results. [7] EPA's

proposal to use OGI to inform its new "leaker factor" simply trades one problem with EPA Method 21 for virtually the same problem with OGI. Concerningly, there is ample data from screening technologies that could better inform the leaker factor, yet EPA only allows these techniques to be used as optional, supplemental information. A data source that could be 18 times lower than reality should not be the default choice; this will virtually guarantee EPA's GHGRP continues to badly miss on the true amount of emissions. Figure 2 demonstrates the wide discrepancy between aerial and OGI measurements to underscore the severity with which an OGI-based leaker factor may continue to undercount emissions.

[See DCN EPA-HQ-OAR-2019-0424-0176-A1 for Figure 2: Site-by-site measured emissions for larger facilities in the aerial survey with identified individual source types labeled in blue. The comparison with OGI survey emissions (orange) is shown for the 45 multiwell batteries in both surveys. The methane contribution from reported venting during the month of the airborne survey (if any) is shown in green for comparison. Note the broken scale on the vertical axis. Image courtesy of Johnson et al.]

Footnotes

[7] "Where the Methane Is—Insights from Novel Airborne LiDAR Measurements Combined with Ground Survey Data" Tyner et al. 2021 https://pubs.acs.org/doi/10.1021/acs.est.1c01572

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 8

Comment Excerpt: Currently, leaks found at sites via screening methods provided under Subpart W (OGI, IR, and Acoustic) have used the leak rates for Method 21 inspections with a leak definition of 10,000 ppm. In the proposed revisions, EPA is arguing that these methods are less-sensitive than Method 21 inspections, and therefore require their own set of emissions factors to correctly represent the higher overall leak rate that will be found in these inspections. EPA has created the proposed factors by using information from two studies: a 2019 Study of methane emissions from gathering and Boosting Compressor Stations (the "Zimmerle Study") and a 2020 Study of equipment leaks from oil and gas sites in the western United States (the "Pacsi Study"). All the proposed changes result in a higher leak rate, with the sole exception of the Oil Service – Other category. All the increases result in an emissions rate from around 3x the current emissions factor to almost 10x the current emissions factor.

PBPA is concerned about the conclusion that OGI methods are less sensitive than Method 21 inspections using the 10,000 ppm threshold. The Zimmerle study did not include Method 21 inspections in its methodology to compare the two methods. While the Pacsi study did use Method 21 inspections to compare the two methods, it noted that the leaks found using OGI in this study were generally higher than in previous studies, such as the Allen Study from 2013. The study also notes that using the current Subpart W factors would have overestimated the total

emissions from the inspected facilities by 22% to 36% depending on the instrument response factors. Due to these findings, we believe to obtain the most accurate leak factors, more studies are necessary to further quantify the emissions and to determine if there is any need for revised factors.

Commenter Name: Ryan Watts
Commenter Affiliation: Kentucky Oil and Gas Association (KOGA)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0182-A1
Comment Excerpt Number: 11

Comment Excerpt: The emission factors that EPA is proposing in this change are not precise and were not originally developed for use in this fashion. The modifications that are presented in Subpart W do not provide the accuracy that should be required for potential tax or penalty generating activities. We recommend that EPA invest sufficient resources to develop emission factors that are reliable and repeatable for application under Subpart W.

Industry has shared with EPA many times that the oil and gas industry does not conform to a "one size fits all" approach. As EPA is developing new, and revising existing, emissions factors, EPA needs to consider the various pressure and composition operating scenarios that exist from one part of the United States to another. This is illustrated in the DOE Marginal Well study that was released in May 2022.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 16
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: Under § 98.236(q)(2)(iii), EPA has revised the language regarding default whole gas leaker emission factors to be consistent with "well type." However, the emission factors presented in the revised Table W–1E do not refer to "well type" but organize leaker emission factors by component type in either oil or gas service. Further, the language under § 98.236(q)(2)(iii) associates component types by well service rather than component service. The factors in Table W–1E, referring to component type and service is the appropriate approach, while well type is incorrect and confusing. Components at an oil well may be in gas service and components at a gas well maybe in oil service. For this reason, and consistency with Table W–1E, EPA must clarify which emission factor an operator should apply in cases where the well type and component-type and service are not consistent, *e.g.* when a component at an oil well is

in gas service. The Industry Trades support the elimination of Component count method 2 as the agency revises the population average leak emission factors to a major equipment emission factor approach.

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 1

Comment Excerpt: While natural gas emits significantly less CO_2 than coal when combusted to generate electricity, uncontrolled methane emissions from the production and transportation of natural gas can offset some of that benefit. Ensuring that methane emissions from the entire natural gas supply chain are both minimized and reduced is essential to the industry's ability to continue to utilize natural gas and emerging fuels that can be transported using natural gas infrastructure.

It is appropriate to update emissions factors to reflect the best available data to ensure that reported data is accurate, as EPA asserts is its goal with respect to these revisions. It also is appropriate for EPA to encourage those facilities that report under Subpart W to use the most accurate and modern approaches to monitoring and measuring emissions from this source category and its many components. See, *e.g.*, id. at 36,976-77 (authorizing facilities that use direct measurement of leaks to quantify emissions). However, EPA has failed to state how it will explain the potential increase in emissions related to these changed emissions factors or the fact that data from this sector collected and reported before 2023 will not be comparable to data collected after the effective date of the proposed revisions. This is potentially problematic for companies that use natural gas and report these supply chain emissions as it will appear that their indirect emissions will have increased.

EPA should explain in the final rule that data from 2023 on cannot be compared to data from earlier in the life of the GHGRR; such statement should appear prominently on EPA's website.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 11

Comment Excerpt: The use of additional methods or AMLD and direct measurement technologies by companies is needed as an alternative way to quantify leaks and is critical to document results of methane emissions reduction initiatives.

EPA has proposed an option to allow reporters to quantify emissions from equipment leak components by performing direct measurement.[15] However, all leaks identified during a "complete leak detection survey" must be quantified; reporters cannot use leaker emission factors for some leaks and quantify other leaks identified during the same leak detection survey. For downstream industry segments, a complete leak detection survey is facility-wide and therefore electing to perform direct measurement of leaks would also have to be facility-wide. Although this might be practical for conducting leak testing at a facility that is located at a single site, such as a natural gas compression station or LNG storage facility, it is not practical to require that direct measurement be used for the T-D transfer station components within a distribution system that covers an entire LDC service territory. EPA should revise the proposal to at least allow the use of direct measurement at an individual location, such as a single T-D transfer station. EPA is also seeking comment on alternative methods for quantifying leaks for use for these equipment leak measurements along with supporting information and data.

As we broaden our pilots into standard operating processes, the ability to report our directly measured emissions to EPA versus reporting emissions pursuant to Subpart W emission factors and facility counts will provide a more accurate accounting of our emissions and demonstrate our year-over-year progress in reducing emissions. Despite our very best efforts to reduce emissions and identify enhanced measures to quantify real emissions, EPA's current prescribed method to report emissions with national emission factors and facility counts will never represent the progress we are making in reducing emissions. Duke Energy is concerned that the inability to utilize a combination of directly measured emissions where the technology and corresponding processes are deployed, and the national emission factors/facility counts in parts of the system where we do not yet have the technology deployed is not encouraging direct measurement when possible. The requirement to deploy direct measurement for leak detection across an entire LDC (which EPA defines as the "reporting facility") or not at all would essentially eliminate, or at least significantly delay, the ability to provide more accurate information based on advanced technology

Footnotes

[15] 87 Fed. Reg. at 36,977; 40 C.F.R. § 98.233(q).

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 12

Comment Excerpt: Duke Energy is concerned that the inability to utilize a combination of directly measured emissions where the technology and corresponding processes are deployed, and the national emission factors/facility counts in parts of the system where we do not yet have the technology deployed is not encouraging direct measurement when possible. The requirement to deploy direct measurement for leak detection across an entire LDC (which EPA defines as the

"reporting facility") or not at all would essentially eliminate, or at least significantly delay, the ability to provide more accurate information based on advanced technology.

AMLD technologies vary and are advancing rapidly. Duke Energy has several different pilots underway along with the creation of an emissions data platform developed in partnership with Accenture and Microsoft. We have selected various parts of our distribution system, across several states, to use the technology, develop processes, study data, validate data, and make improvements. We believe it is beneficial to both Duke Energy and our customers to implement these pilots and eventual deployment in a phased, deliberate approach. We must consider the cost of the technology, each of the diverse operational areas within the state, and our limited resources to ramp up direct measurement of emissions. Waiting until such time that we are able to perform direct measurement across all assets within an entire state would serve to discourage companies like Duke Energy from voluntarily beginning to directly measure their emissions and adapt processes and operational activities accordingly. Duke Energy believes EPA should permit a company to utilize direct measurement on facilities where it is deployed within the state, in addition to traditional EPA Subpart W surveys where emissions are not being directly measured.

Duke Energy has also accelerated our leak survey program to clear our leak inventory and is working towards a "find it – fix it" business strategy so leaks are remedied much faster than regulations specify. Since making this change, we have decreased the number of leaks by more than 85%. Where a leak was detected as part of the Subpart W survey, we believe we should be permitted to account for the remediation of the leak in leak data reporting records.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 4

Comment Excerpt: It is also not clear how EPA would expect a natural gas distribution entity to report methane emissions using these new leaker emission factors when leak testing is performed over a multiyear period as allowed by the regulation. Would the new factors be applied to testing that was done within the previous years that are included in the calculation of the leak rates determined over the testing cycle? Duke Energy recommends that any revision to the factors would apply only going forward, and data used from previous years' testing would continue to apply the current leaker emission factors.

Commenter Name: Curtis J. Winner
Commenter Affiliation: New Mexico Gas Company (NMGC)
Commenter Type: Industry
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0203-A1
Comment Excerpt Number: 5

Comment Excerpt: For the gas distribution sector, the agency is proposing to allow gas utilities to conduct their annual Subpart W survey of transmission to distribution pressure reduction stations ("T-Ds") using direct measurements. EPA proposes to continue the practice of requiring a complete facility leak survey, which in the natural gas distribution sector means all the T-Ds in the entire state-wide gas distribution system operated by the same gas utility. EPA has allowed gas utilities to conduct their T-D surveys over multiple years, up to five years, provided the utility surveys a roughly equal number of T-Ds per year. EPA should continue to allow spreading this task across more than one year both for traditional Subpart W T-D surveys and for the new direct measurement option. As direct measurements using a high-volume sampler or calibrated bag are more time consuming, this ability to spread the task across more than one year will be even more important to its feasibility.

Commenter Name: Amy D. Kapuga
Commenter Affiliation: Consumers Energy Company
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0221-A1
Comment Excerpt Number: 4

Comment Excerpt: Consumers Energy supports EPA's proposals to allow an option to take direct measurements, but we suggest that the EPA continue to allow for conducting surveys for Transmission-Distribution (T-D) custody transfer stations over multiple years. A company should continue to use its previous T-D emission factor for the T-D stations not yet subject to direct measurements. In addition, where a company follows up a leak detection with repair, the company should not be required to apply an emission factor that assumes the leak continues for the entire year or until the next survey. We believe that a reporting program that allows for a compilation of site-specific direct measurements, in addition to utilization of appropriate emission factors for stations that have not yet conducted direct measurements, would represent the best emissions data for all stakeholders. Industry is at varying stages of this survey to measurement transition and should not be preemptively locked into one reporting scheme.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 14

Comment Excerpt: We are pleased that the agency is proposing an option for reporting entities in the natural gas value chain to conduct direct measurements of leaks using technology such as a high-volume sampler or calibrated bag methodology to allow reporting more accurate emissions data under Subpart W. For the gas distribution sector, the agency is proposing to allow gas utilities to conduct their annual Subpart W survey of transmission to distribution pressure reduction stations (T-Ds) using direct measurements. The Associations believe that this is an improvement over the current method using: (1) an activity count of all leaks (detected at a concentration at or above 10,000 ppm); (2) applying a formula in the rule to calculate an average emission factor per T-D; and (3) multiplying that population-based emission factor by the number of above ground T-Ds and above ground M&R stations in the utility's gas distribution system across a single state.

EPA proposes to continue the practice of requiring a complete facility leak survey, which in the natural gas distribution sector means all the T-Ds in the entire state-wide gas distribution system operated by the same gas utility (what EPA defines as a "facility"). EPA's use of the term "facility" for the distribution sector is unique in that it is not limited to the normal fence line concept of "facility." In the current rule, a gas distribution "facility" is defined to mean "the collection of all distribution pipelines and metering-regulating stations that are operated by a Local Distribution Company (LDC) within a single state that is regulated as a separate operating company by a public utility commission or that are operated as an independent municipally-owned distribution system." 40 C.F.R. 98.238. Recognizing that some gas utilities have hundreds or even thousands of T-Ds spread throughout a state, EPA has allowed gas utilities to conduct their T-D surveys over multiple years - up to five years - provided the utility surveys a roughly equal number of T-Ds per year. For example, a utility could survey one-fifth of its T-Ds per year over a five-year cycle. Alternatively, it could use a two-year cycle and survey half of its T-Ds per year. EPA should continue to allow spreading this task across more than one year both for traditional Subpart W-TD surveys and for the new direct measurement option. As direct measurements using a high volume sampler or calibrated bag are more time consuming, the ability to spread the task across more than one year will be even more important to its feasibility.

In addition, we ask that EPA allow a company to continue using its previous T-D emission factor for the T-Ds not yet subject to direct measurements and to use a blended company/utility emission factor for other metering and regulating stations (M&Rs). This blended emission factor should apply to both above and below ground structures. The Associations recommend that a utility's blended emission rates should be based on the proportion of its T-Ds directly measured versus the T-Ds still using the previous Subpart W survey method until all the T-Ds have gone through a full cycle of surveying using direct measurements.

The Associations also agree with INGAA's comments that when a leak is detected in a Subpart W leak survey and the gas utility has records demonstrating the date it was confirmed to be fixed, EPA should allow the operator to use the date the leak was fixed as its end date. That principal should apply in all industry segments, including gas distribution.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration &

Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 14

Comment Excerpt: The Industry Trades support efforts to properly characterize a leak by the period in which that leak is detected. This will further align subpart W with the proposed methane rule, which mandates that any leaks must be repaired as soon as practicable. To that extent, we recommend EPA amend the definition of $T_{p,z}$ in Equation W–30 to better reflect the implementation of monitoring and repair programs by acknowledging that the duration of the leak may be subject to the action of repair and verification, and not solely by a traditional survey and/or the start or end of the reporting year, similar to the recommended revision to the definition of T_z in Equation W–1B.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 15
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: We also recommend that EPA revise the approach to include other activities in addition to leak detection surveys that may offer an indication of a repaired leak. While the current proposed language refers only to a "survey" an operator will have other clear indicators that a leak has been addressed including the repair date or other detection approach. EPA should include any other such activity on which an operator seeks to assign a repair date other than a survey as a reporting element.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 14

Comment Excerpt: The Proposed Rule must allow operators to use leak detection and repair records to determine the number of hours a component leaked instead of using the default value of 8,760 hours.

In the Proposed Rule, the total annual total volumetric emissions of GHG are calculated by multiplying the leaker emissions factor by the total time the surveyed component was assumed to be leaking (98.233(q)(2) Calculation Method 1: Leaker emission factor calculation methodology Equation W–30)**. The procedure assumes a component continuously leaks since the prior annual survey. In cases where a Subpart W survey is only done once per year (the rule requirement), this assumption results in using 8,760 hours as the total time a component was leaking.

Whereas official Subpart W leak surveys of the entire facility are only required once per year, many facilities have mandated Leak Detection and Repair (LDAR) programs that survey components on a more frequent schedule and require first attempt at repair within as little as 15 days. The recordkeeping and reporting provisions of these programs are required to document and verify the repair of the leak. In these cases, it can be proven that the component was not leaking for the entire year. A date of when the leak stopped is specifically documented.

The calculation procedures in the proposed rule do not allow a facility to account for the emissions eliminated by repairing the leak off cycle from the leak survey schedule. Ignoring the cessation of emissions from fixing a leak between Subpart W surveys overestimates the GHG emissions. Allowing for documented leak repair records to be used will result in more accurate emission estimation and is consistent with the goals of the proposed rules is to improve the accuracy of the emission estimations.

Therefore, INGAA is asking EPA to develop a method where operators can use documented leak repairs to calculate the total time a component is assumed to be leaking.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 40

Comment Excerpt: We support EPA's efforts to align subpart W with forthcoming regulatory requirements and in this section we provide recommendations for further alignment. A significant portion of subpart W reporting facilities and emission sources will become subject to leak detection and repair (LDAR) requirements under OOOOb or an applicable approved state plan or applicable Federal plan developed under OOOOc in the coming years.[107] We therefore support EPA's proposal to require these facilities to report data gathered through leak monitoring surveys, and the option to do so voluntarily for facilities or portions of facilities not subject to regulatory monitoring requirements. Because these facilities and sources will already be required to monitor for LDAR compliance, reporting data gathered through those surveys to subpart W poses very little additional burden. EPA should additionally require for larger leaks that duration be estimated, either through use of operational data, or where none is available, the leak should be assumed to have existed since the last LDAR survey.

We also support EPA's proposal to expand the current reporting requirement in 40 C.F.R. § 98.236(q)(1)(iii) to require reporters to indicate if any of the surveys of well sites or compressor stations used in calculating emissions under 40 C.F.R. § 98.233(q) were conducted to comply with the fugitive emissions standards in OOOOb or an applicable approved state plan or applicable Federal plan. We believe this information will be useful to understand the amount of leak monitoring that is occurring voluntarily versus for compliance, and for understanding the effectiveness of LDAR regulations.

To align subpart W reporting with the alternative screening LDAR approach proposed for OOOOb and OOOOc, we suggest that EPA include as a separate category of reported emissions those detected through screening. This could be done by adopting our recommendations for "large release events" described above. If follow up OGI surveys can pinpoint the emission source, then the emissions should be attributed to that source. But in some cases emissions may not be found on follow up; those should nonetheless be reported in a separate category. EPA should revisit this topic when considering how to meet the MERP directive as well because many of the advanced technologies that may be used for compliance with OOOOb and OOOOc are capable of measurement and will detect emissions that far exceed the default leaker factors. For example, applying the default leaker factor to emissions detected by an aerial survey would greatly underestimate the magnitude of the leak. We recommend that EPA align reporting requirements with the finalized OOOOb and OOOOc advanced screening standards, and take care to ensure reporting does not disincentivize the adoption of these technologies.

Footnotes

[107] Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review, 86 Fed. Reg. at 63,110 (proposed Nov. 15, 2021).

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 11

Comment Excerpt: We support EPA's efforts to align Subpart W with forthcoming regulatory requirements and in this section provide recommendations for further alignment. A significant portion of Subpart W reporting facilities and emission sources will become subject to LDAR requirements under OOOOb and OOOOc in the coming years. We therefore support EPA's proposal to require these facilities to report data gathered through monitoring surveys, and the option to do so voluntarily for facilities or portions of facilities not subject to fugitive monitoring regulatory requirements. Because these facilities and sources will already be required to monitor for LDAR compliance, reporting data gathered through monitoring surveys through Subpart W poses very little additional burden. EPA should additionally require for larger leaks that duration be estimated, either through use of operational data, or where none is available, the leak should be assumed to have existed since the last LDAR survey.

We also support EPA's proposal to expand the current reporting requirement in 40 CFR 98.236(q)(1)(iii) to require reporters to indicate if any of the surveys of well sites or compressor stations used in calculating emissions under 40 CFR 98.233(q) were conducted to comply with the fugitive emissions standards in NSPS OOOOb or an applicable approved state plan or applicable Federal plan. This information will be useful to understand the amount of leak monitoring that is occurring voluntarily versus for compliance, and for understanding the effectiveness of leak monitoring.

To align Subpart W reporting with the alternative screening LDAR approach proposed for OOOOb and OOOOc, we suggest that EPA include as a separate category of reported emissions those detected through screening. If follow up OGI surveys can pinpoint the emission source, then the emissions should be attributed to that source. But in some cases, emissions may not be found on follow up; those should nonetheless be reported in a separate category. EPA should revisit this topic when considering how to meet the congressional directive as well because many of the advanced technologies that may be used for compliance with OOOOb and OOOOc are capable of measurement and will detect emissions that far exceed the default leaker factors. For example, applying the default leaker factor to emissions detected by an aerial survey would greatly underestimate the magnitude of the leak. We recommend that EPA align reporting requirements with the finalized OOOOb and OOOOc advanced screening standards and take care to ensure reporting does not disincentivize the adoption of these technologies which can be highly effective.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 39
Excerpt Status: Not Started

Comment Excerpt: Request for comment: "We request comment on the proposed amendments to subpart W for onshore natural gas processing facilities subject to the equipment leak provisions of NSPS OOOOb or 40 CFR part 62, as well as whether there are other provisions or reporting requirements for these facilities that we should consider."

EPA should not mandate that data from so-called "incomplete" surveys be incorporated into the calculations. Doing so increases the complexity of the leak calculations, since some components will have different leak times in equation W–30.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 12

Comment Excerpt: AIPRO objects to the proposed Appendix K OGI monitoring requirements as they are impractical and unworkable.

- The monitoring requirements described in Appendix K are more aligned with facilities such as refining and processing plants. The requirements are unduly burdensome and not cost-effective for upstream sites such as well pads, compressor stations, and gathering and boosting facilities.
- Operators have been performing OGI surveys according to Subpart OOOOa since 2015 and have a proven track record of reducing methane emissions. Appendix, K, as proposed, is not feasible for operators to implement considering that the EPA is not only expanding the sheer number of sites subject to OGI inspections but also making the inspection standards much more stringent.
- AIPRO is of the opinion that Appendix K, will have a minimal impact on overall methane emissions while substantially increasing operator costs.
- AIPRO urges the EPA to retain the current NSPS OOOOa requirements for OGI surveys and withdraw the proposed requirements of Appendix K.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 11

Comment Excerpt: EPA proposed in its NSPS OOOOa/b/c that owners and operators would detect leaks using an OGI-based monitoring method following proposed Appendix K to AQ CFR part 60. The Alliance submitted comments to EPA during the comment period for the proposed NSPS OOOOa/b/c rule and raised significant concerns with the use of the proposed Appendix K. Current OGI requirements help operators find and fix leaks quickly, meeting the intended goal of the program; however, the requirements in Appendix K unnecessarily complicate the process, and is onerous for operators, especially smaller oil and gas operators. The use of Appendix K will unnecessarily delay leak detection and may negatively impact the environment.

We request EPA maintain the current OGI requirements. The following information is an excerpt of our comments submitted to EPA on its proposed NSPS OOOOa/b/c rule regarding Appendix K.

First, in EPA's December presentation, Appendix K is written for broader applicability other than the upstream oil and natural gas sector. We do not think Appendix K should be a separate, standalone document. Future amendments to Appendix K focused on other industrial sectors may have unintended consequences on upstream oil and gas production operations as it relates to

NSPS OOOOa/b/c rules. In addition, the proposed performance verification, development of the operating envelope, monitoring plan, verification checks, survey requirements, operator training/audits, recordkeeping, etc. are excessive. EPA is making these survey compliance requirements too complicated and onerous for all operators, especially for small oil and gas operators that have marginal/low production wells *e.g.*, the requirements will significantly extend survey timeframes beyond what is necessary to detect fugitive emissions, will likely require the use of contract surveyors, require excessive electronic recordkeeping efforts, and increase costs excessively. Additionally, we question if there will be adequate surveyors available to all operators, especially small oil and gas operators, when needed to meet the monitoring compliance requirements of NSPS OOOOa/b/c. Finally, if EPA makes this a requirement for oil and gas operators, it should apply these same standards to any entity conducting or using such equipment for emissions monitoring surveys. We request EPA maintain the current OGI methodologies under NSPS OOOOa.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 7

Comment Excerpt: As was noted by many industry commentors during the comment period for the Proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review[3], the proposed Appendix K training and survey requirements were overly burdensome and unnecessarily expensive. The Agency proposes to utilize the same monitoring methods in Subpart W, arguing that doing so will allow reporters to comply with subpart W and OOOOb with the same data. The overly burdensome nature of the proposed requirements in Appendix K has not changed and comments provided on Appendix K in the November 2021 rulemaking apply to this proposed revision to the GHG Reporting Rule. The training and survey requirements are overly burdensome to reporters and should be streamlined to improve the Proposed Rule. EPA must resolve the concerns and comments raised during the prior rulemaking regarding Appendix K and propose the final version of Appendix K before Williams and others in the industry and public can fully comment on whether the proposed action (*i.e.* incorporate Appendix K requirements into Subpart W) is appropriate.

Footnotes

[3] Proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review, 86 Fed. Reg. 63,110 (Nov. 15, 2021).

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 14

Comment Excerpt: Subpart W cannot cross-reference or rely on a separate EPA proposed rule and not yet adopted revisions to subparts OOOOb and OOOOc of Part 60 related to new source performance standards for the oil and gas sector.

On November 15, 2021, EPA proposed new requirements and guidelines for the oil and gas sector at new 40 C.F.R. Part 60, Subpart OOOOb and new 40 C.F.R. Part 60, Subpart OOOOc. EPA has not yet adopted these new regulations nor even publicly released proposed regulatory language, however, and significant concerns have been raised with the proposed concepts that were made available nearly a year ago. As a result, it is not appropriate for the Agency to rely on or incorporate by reference such unadopted concepts.

Particularly troublesome is EPA's reliance in Subpart W of the proposed 40 C.F.R. Part 60 Appendix K protocol for use of optical gas imaging cameras. The proposal in Appendix K is entirely unmanageable and will not improve the quality of OGI surveys. Moreover, EPA has yet to even adopt the proposed protocols. Accordingly, it would be premature for EPA to rely on that protocol for Subpart W reporting.

Concerns with EPA's proposed Appendix K were extensively discussed in the Marcellus Shale Coalition's January 31, 2022 comments on EPA's proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review (Docket: EPA-HQ-OAR-2021-0317). Range agrees with these comments and incorporates them by reference into these comments.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 4

Comment Excerpt: AIPRO objects to any provisions or reporting requirements of proposed NSPS OOOOb or EG OOOOc being referenced or required in Subpart – W as a whole, and specifically within the "Equipment Leak Surveys" section. Reporters subject to Subpart W requirements are unable to adequately review and interpret the impacts and appropriateness of the proposed revisions to Subpart W, because OOOOb and OOOOc are not yet finalized and proposed regulatory text has not yet been provided. This contradicts the procedural requirements EPA must follow when promulgating new rules, and therefore should not be allowed unless and until proposed OOOOb and EG OOOOc become final rules.

EPA indicates that historical GHG emissions inventories were used in its policy development efforts, specifically those associated with proposed NSPS OOOOb and EG OOOOc. EPA acknowledges that it relied on poor quality and inaccurate data from historical GHGRP submissions since the inception of the program, to inform the proposed OOOOb and OOOOc rules. These proposed rules, in some instances, are very likely based on overstated emissions from sources such as intermittent bleed pneumatic devices. Therefore, the data should never have been used as a basis for proposed NSPS OOOOb and EG OOOOc. AIPRO calls on the agency to withdraw the proposed NSPS OOOOb and EG OOOOc rules.

Commenter Name: Ryan Watts
Commenter Affiliation: Kentucky Oil and Gas Association (KOGA)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0182-A1
Comment Excerpt Number: 10

Comment Excerpt: The intermittent pneumatic changes may not accommodate the actual measurement (actuation based accounting). This method is recognized internationally through IPCC and OGMP 2.0 as a superior method, but EPA's program lags in recognition. EPA's proposed 8.8 scfh emissions factor is an improvement over the current 13.5.

The leak rate for pipe is proposed to be increasing substantially (almost double) based on a single dated study. In addition, it appears that there is no method for reducing these factors if a company does voluntary leak surveys. Just as the voluntary performance of Method 21 compliant surveys allows Green House Gas reporting factors to be zeroed out at production facilities, we recommend that leak surveys conducted by aerial patrols or line patrols conducted using RMLD, which is recognized in the proposed rule as a valid method for pneumatic malfunction surveys, should be a valid means for reducing leak emission factors for pipe.

Commenter Name: Kim White
Commenter Affiliation: EOG Resources, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0235-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA should allow flexibility for operators to use the § 98.234(b)-(d) methods to establish representative equipment leak factors, including for natural gas pneumatic device venting.

EOG requests that EPA clarify in the preamble that the § 98.234(b)-(d) measurement methods can be used to establish custom measurement-based emission factors for equipment leaks rather than requiring all leaks to be quantified on an individual basis. In addition, EPA should

incorporate an option to use the § 98.234(b)-(d) methods to establish representative emission factors for natural gas pneumatic device venting. The actual measured emissions can be used to develop emission factors based on like-kind equipment.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 8

Comment Excerpt: EPA should clarify that leaks from pneumatic devices are reported only under the leak survey and detection requirements of 40 C.F.R. § 98.233(q). It also should allow for representative direct measurement of such leaks to improve reporting accuracy.

Subpart W requires onshore petroleum and natural gas production operators to report "leak" emissions from various pieces of equipment at a facility as a standalone source type. 40 C.F.R. 98.232(21).

a. In the Proposed Rule EPA allows operators the option to account for leak emissions from "malfunctioning intermittent devices" as part of the pneumatic device venting emissions using Equation W–1B. 40 C.F.R § 98.233(a)(6)

b. EPA should clarify that the leak emissions reported using survey data for malfunctioning intermittent devices, reported under § 98.233(q), do not also need to be reported as part of pneumatic device venting under 40 C.F.R. 98.233(a).

c. Emission leaks that are discovered during surveys performed pursuant to § 98.233(q) should not also be reported as pneumatic device venting under § 98.233(a). Otherwise, there will be double counting of the same emissions.

d. In other words, EPA should clarify that normal venting and equipment leaks from pneumatic devices are reported separately.

    (i) Monitoring and quantifying leaks is fundamentally different from monitoring and quantifying vents. By separating the two approaches—and reporting schemes—EPA will receive more accurate reporting of both leaks and venting, helping EPA achieve its stated objective of accurately characterizing GHG emissions.

    (ii) As such, Range believes that it is appropriate for EPA to clarify that § 98.233(a) only requires reporting of properly operating pneumatic devices, while § 98.233(q) requires reporting of leaks from those pneumatic devices, which, under current regulations, can be more accurately directly measured by operators

e. To the extent that the Technical Support for the default emissions factors for pneumatic devices in Table W–1A used studies that included malfunctioning devices or unexpected emissions from pneumatic devices, such emissions would be double-counted as leaks under § 98.233(q). Accordingly, EPA also needs to clarify whether the technical basis (*i.e.*, studies) used for developing the emissions factors for calculating normal operating emissions from pneumatic devices excluded all malfunctioning emissions (*i.e.*, leaks). If EPA cannot offer this clarity, then EPA cannot assure the public and the regulated industry that emissions from pneumatic devices are not being double counted.

Commenter Name: Brian Jones
Commenter Affiliation: Downstream Natural Gas Initiative
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0249-A1
Comment Excerpt Number: 4
Excerpt Status: Not Started

Comment Excerpt: DSI supports EPA's efforts to improve estimates of methane emissions by allowing direct measurements. Specifically, DSI supports EPA's proposal to allow LDCs to quantify emissions from transmission-distribution stations using direct measurements. More broadly, DSI encourages EPA to allow companies to use company-specific data and advanced methane detection and quantification technologies to estimate methane emissions. For LDCs, DSI supports flexibility to allow companies to develop company-specific emission factors and calculate emissions using the number of leaks on the distribution system.

Commenter Name: Asa Carre-Burritt, PhD
Commenter Affiliation: Bridger Photonics, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0253-A2
Comment Excerpt Number: 4

Comment Excerpt: The Proposed Rule includes an amendment to allow reporters to directly quantify emissions from equipment leak components instead of using default leaker emission factors. Bridger supports this amendment because it enables more granular data to be collected under subpart W. Furthermore, Bridger urges the EPA provide an optional pathway to use measurements from advanced technologies in addition to existing subpart W methods to report equipment leak emissions. Advanced measurement technologies with high sensitivity, precise emissions source localization, and accurate quantification may already be deployed for regulatory compliance or as part of voluntary programs meaning that direct measurements were already performed and could be used for streamlined reporting.

Considering that the EPA seeks component-level emission information, when component attribution is not feasible from an advanced measurement technology data set, follow up with a suitable ground based emission detection technology such as OGI can help attribute the emission to a component. It is standard practice for reporters to perform ground-based follow up work for emissions detected by advanced technologies. Furthermore, a complete follow-up OGI facility survey is already required for the alternative fugitive emissions monitoring and repair program using advanced measurement technologies specified in proposed 40 CFR part 60 subpart NSPS OOOOb and presumptive standards EG OOOOc rules when emissions are identified at an affected well site or gathering and boosting compressor station.

We encourage the EPA to provide the option for comprehensive and streamlined reporting pathways using advanced measurement technologies as outlined above not only for facilities subject to proposed 40 CFR part 60 subpart NSPS OOOOb and presumptive standards in EG OOOOc provisions for alternative fugitive emissions monitoring, but across subpart W industry segments. Reporting emissions in this manner improves subpart W reporting because emissions can be found and accounted for by advanced technologies regardless of whether they come from sources that were previously required to be screened. This means that unexpected emission sources could be captured.

Commenter Name: Howard R. Dieter
Commenter Affiliation: Jonah Energy LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0200-A1
Comment Excerpt Number: 5
Excerpt Status: Not Started

Comment Excerpt: Jonah Energy encourages EPA to consider developing a reporting format that allows for quantified emissions using a high flow sampler or equivalent technology to report emissions associated with leaks as an alternative to component counts or leaker factors. We have been measuring leaks as part of our LDAR program for over 8 years. Our inspectors measure and record leak rates at the time of the inspection. Jonah Energy currently uses a high glow sample for quantifying leaks and we are evaluating a new OGI camera with quantification capabilities.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 9

Comment Excerpt: EPA should allow for representative direct measurement of emissions from malfunctioning intermittent devices.

The Proposed Rule includes a method for calculating equipment leak surveys. 87 Fed. Reg. at 37079. The method requires use of a default emissions factor, which would apply even at malfunctioning intermittent devices. However, Range and other operators have the ability to perform representative direct measurement of emissions from leaking intermittent pneumatic devices. As a result, EPA should include in the final rule a provision allowing operators to report leak emissions from malfunctioning intermittent pneumatic devices using representative direct measurements, as opposed to only the standard calculation using default emissions factors that do not take into account actual operating conditions or data.

Commenter Name: Brian S. Taylor
Commenter Affiliation: Project Canary, PBC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0186-A1
Comment Excerpt Number: 2

Comment Excerpt: We recognize the need to update emissions factors to current, more relevant data supported by information from multiple studies to ensure the data reported is the best representation of emissions from the sector. However, while the changes proposed in Subpart W provide incremental benefit when compared to currently approved emissions factors, Project Canary believes that emissions factor methodologies do not provide enough granularity or site-specific information to account for significant emissions rate differences across the Petroleum and Natural Gas sector, by facility and operating basins. In fact, studies have shown that a comprehensive top-down, bottom-up approach is a more accurate method of reporting actual emissions from the oil and gas industry.[2] We believe that it is important for EPA to begin to shift away from emissions factor based GHG reporting protocols and move toward measured emissions by allowing operators to report measured emissions from onsite emissions monitoring and quantification technologies.

Emissions factors do not provide an accurate representation of fugitive emissions from oil and gas locations; however, an approach which incorporates leak detection and quantification data from multiple sources, such as continuous monitors, flyovers, drones, satellites, handheld devices, etc., called a "Digital Canopy," can provide a better representation of actual emissions from an oil and gas location, while also identifying leaks for alerting and subsequent repair. This Digital Canopy approach provides a more holistic evaluation of facility level emissions, increasing the accuracy of emissions reported under the GHGRP.

We strongly encourage the EPA to allow companies to report actual emissions from their locations by incorporating a Digital Canopy approach to leak detection, repair, and quantification, and phase out the use of inaccurate fugitive emissions factors and component counts by major equipment, which are inherently problematic. We are encouraged by EPA's forthcoming proposed rule on Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review, 86 Fed. Reg. 63, 110, RIN 2060-AV16 (November 15, 2021) (NSPS OOOOb/c) and the opportunity to expand leak detection procedures beyond Method 21 and Optical Gas Imaging

(OGI). Project Canary strongly supports a Digital Canopy approach for leak detection in NSPS OOOOb/c. We encourage the EPA to adopt a Digital Canopy approach in Subpart W, aligning with the forthcoming NSPS OOOOb/c Supplemental, to allow reporting companies to utilize emissions monitoring and quantification data in their respective reports.

Footnotes

[2] "Reconciling divergent estimates of oil and gas methane emissions," Zavala-Araiza, et.al. 2015, https://www.pnas.org/doi/epdf/10.1073/pnas.1522126112.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 64

Comment Excerpt: We encourage EPA to both use existing aerial data and collect new data to explicitly assess differences in gathering pipeline emissions across basins. Such analysis would help inform an updated national emission factor for gathering pipelines based on empirical measurement approaches. We also recommend that EPA require reporting on station count in gathering. This would be helpful data for further assessing emissions from this segment.

A recent study used methane emission measurements collected from four discrete aerial campaigns in 2019- 2021 alongside GIS data of pipeline mileage to calculate a methane emission factor for gathering pipelines in the Permian Basin.[141] From each campaign, they quantified emission factors ranging from 2.7 to 10.0 metric tons CH_4 per kilometer per year (4,300 to 16,000 kilograms CH_4 per mile per year), which are 14- 52 times higher than the EPA's GHGI estimate of 310 kilograms CH_4 per mile per year, which considers both fugitive emissions and blowdown or other maintenance events. The study showed that a relatively small number of pipeline emission sources were responsible for a large fraction of total methane flux originating from pipelines, demonstrating that, as in the case of other oil and gas infrastructure,[142] a large sample size is necessary to identify rare but large emission sources.

To our knowledge, this is the first published, peer-reviewed study that explicitly estimates an emission factor for gathering pipelines, and its results imply that the GHGI methane emission factor for gathering pipelines is a severe underestimate, in light of what was observed in multiple aerial campaigns. Importantly, the new study still found severely elevated emission factors even when the analysis was restricted to sources observed to be emitting on more than one day, thereby more credibly focusing on fugitive emissions, rather than on blowdowns or other temporary maintenance events.

This study offers a useful first look into quantifying gathering pipeline emissions using aerial measurement data, but there are two main limitations to note. First, although aerial remote sensing is useful for collecting a large sample size, the relatively high minimum detection limit

of the aerial instrument suggests that the calculated emission factors do not incorporate small emission sources and are thus conservative estimates. Second, this study's observations and results are specific to the Permian Basin over the 2019-2021 period. However, Cusworth et al. (2022) used aerial methane measurement data from several U.S. basins and found significant gathering line emissions in regions beyond the Permian.[143]

Footnotes

[141] Yu et al., Methane Emissions from Natural Gas Gathering Pipelines in the Permian Basin, Environ. Sci. Technol. Lett. (Oct. 4, 2022), https://doi.org/10.102 1/acs.estlett.2c00380.

[142] Chen et al., Quantifying Regional Methane Emissions in the New Mexico Permian Basin with a Comprehensive Aerial Survey, Environ. Sci. Technol. 2022, 56, 7, 4317-4323 (2022), https://doi.org/10.1021/acs.est.1c06458; Cusworth et al., Strong Methane Point Sources Contribute a Disproportionate Fraction of Total Emissions Across Multiple Basins in the United States, PNAS (Sept. 13, 2022), https://doi.org/10.1073/pnas.2202338119.

[143] Cusworth et al., Strong Methane Point Sources Contribute a Disproportionate Fraction of Total Emissions Across Multiple Basins in the United States, PNAS (Sept. 2022), https://www.pnas.org/doi/10.1073/pnas.2202338119.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 21

Comment Excerpt: A recent study used methane emission measurements collected from four discrete aerial campaigns in 2019-2021 alongside GIS data of pipeline mileage to calculate a methane emission factor for gathering pipelines in the Permian Basin.[72] From each campaign, they quantified emission factors ranging from 2.7 to 10.0 metric tons CH_4 per kilometer per year (4300 to 16,000 kilograms CH_4 per mile per year), which are 14-52 times higher than the EPA's GHGI estimate of 310 kilograms CH_4 per mile per year, which considers both fugitive emissions and blowdown or other maintenance events. The study showed that a relatively small number of pipeline emission sources were responsible for a large fraction of total methane flux originating from pipelines, demonstrating that, as in the case of other oil and gas infrastructure (Chen et al. 2022 and Cusworth et al. 2022), a large sample size is necessary to identify rare but large emission sources.[73]

To our knowledge, this is the first published, peer-reviewed study that explicitly estimates an emission factor for gathering pipelines, and its results imply that the GHGI methane emission factor for gathering pipelines is a severe underestimate of what was observed in multiple aerial campaigns. Importantly, the new study still found severely elevated emission factors even when the analysis was restricted to sources observed to be emitting on more than one day, thereby more credibly focusing on fugitive emissions, rather than on blowdowns or other temporary maintenance events.

This study offers a useful first look into quantifying gathering pipeline emissions using aerial measurement data, but there are two main limitations of this study to note. First, although aerial remote sensing is useful for collecting a large sample size, the relatively high minimum detection limit of the aerial instrument suggests that the calculated emission factors do not incorporate small emission sources and are thus conservative estimates. Second, this study's observations and results are specific to the Permian Basin over the 2019-2021 period; however, Cusworth et al. 2022 used aerial methane measurement data from several U.S. basins and found significant gathering line emissions in regions beyond the Permian. We encourage EPA to both use existing aerial data and collect new data to explicitly assess differences in gathering pipeline emissions across basins. Such analysis would help inform an updated national emission factor for gathering pipelines based on empirical measurement approaches.

Footnotes

[72] Jevan Yu et al., Methane Emissions from Natural Gas Gathering Pipelines in the Permian Basin, Env't Sci. Tech. Letters (2022), https://pubs.acs.org/doi/full/10.1021/acs.estlett.2c00380.

[73] Chen et al., Quantifying Regional Methane Emissions in the New Mexico Permian Basin with a Comprehensive Aerial Survey, 56 Env't Sci. Tech. 4317 (2022), https://doi.org/10.1021/acs.est.1c06458; Daniel Cusworth et al., Strong methane point sources contribute a disproportionate fraction of total emissions across multiple basins in the United States, 19 PNAS 38 (2022), https://doi.org/10.1073/pnas.2202338119.

Commenter Name: Asa Carre-Burritt, PhD
Commenter Affiliation: Bridger Photonics, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0253-A2
Comment Excerpt Number: 9
Excerpt Status: Not Started

Comment Excerpt: Subpart W emissions factors for gathering lines are based on studies for the distribution segment because of insufficient information for the gathering and boosting segment.[9,10] Aerially deployed advanced measurement technologies can empirically measure emissions across extensive infrastructure such as gathering lines of which there are hundreds of thousands of miles in the United States.[11] By providing a pathway to report gathering line emissions measurements from advanced technology measurements, the EPA could improve reporting on this infrastructure.

Footnotes

[9] US Environmental Protection Agency. Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule. 87 FR 36920 36920–37119 (2022).

[10] Zimmerle, D. J. et al. Gathering pipeline methane emissions in Fayetteville shale pipelines and scoping guidelines for future pipeline measurement campaigns. Elementa 5, (2017).

[11] Pipeline and Hazardous Materials Safety Administration. Pipeline Safety: Safety of Gas Gathering Pipelines: Extension of Reporting Requirements, Regulation of Large, High-Pressure Lines, and Other Related Amendments. 86 FR 63266 63266–63299 (2021).

Commenter Name: Ryan Streams
Commenter Affiliation: Kairos Aerospace (Kairos)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0176-A1
Comment Excerpt Number: 2

Comment Excerpt: EPA recognizes the shortcoming of ground-based measurement but fails to fully embrace screening measurements.

To underscore the significance of this discrepancy, we have also observed that not only do emissions factor-based techniques fail to accurately account for GHG emissions at the industry level, companies' actual emissions also vary widely from their reported totals under factor-based inventory techniques.

[See DCN EPA-HQ-OAR-2019-0424-0176-A1 for Figure 1: Methane intensity as measured by aerial methane monitoring vs. GHGRP reported emissions and the Oil and Gas Climate Initiative (OGCI) target. The OGCI target is a methane intensity target set by member companies to reduce the average methane intensity of aggregate upstream oil and gas operations to well below 0.20% by 2025, aiming for near zero methane emissions.]

As demonstrated in Figure 1, Kairos Aerospace has clearly observed a large discrepancy between reported and observed emissions.

Commenter Name: Ryan Minegishi
Commenter Affiliation: Konica Minolta Sensing Americas, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0179-A1
Comment Excerpt Number: 1

Comment Excerpt: We are writing in regards to the newly proposed Standards of Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule by the U.S. Environmental Protection Agency (EPA) to comment on our image-based quantification technology as an alternative method for the determination of emission amounts.

Our quantification is a technology that displays the result as shown in Figure 1, by specifying the gas area to be estimated with 4 points, and inputting the gas type, shooting distance and temperature as shown in Figure 2. Quantifiable distance range is from 4 ft to 328 ft. The

estimated result is the average over a 5 second period of recorded material and updates every 5 seconds. Minimum video length for quantification is 7 seconds.

[See DCN EPA-HQ-OAR-2019-0424-0179-A1 for Figure 1: Result Display Screen and Figure 2: Information Input Screen]

The technology consists of two estimation techniques: a) gas concentration length and b) gas flow velocity. By calculating the amount of gas from a) gas concentration length, and the passage time of gas from b) gas flow velocity, a gas flow rate per unit time is estimated. A schematic diagram is shown in Figure 3. Wind measurement is unnecessary as the gas flow velocity is estimated by tracking the gas movement from the images. A patent has been applied for this technique.[1]

[See DCN EPA-HQ-OAR-2019-0424-0179-A1 for Figure 3: Gas Flow rate estimation]

Gas concentration length can be theoretically calculated by the gas temperature, the background temperature in the presence of gas and the background temperature without gas. The gas temperature is assumed to be the ambient temperature input by the user. Furthermore, the background temperature in the presence of gas and without gas are estimated from time-series changes in the infrared images taken as shown in Figure 4. Please see the patent for more details.[2]

[See DCN EPA-HQ-OAR-2019-0424-0179-A1 for Figure 4: Estimation method of gas concentration length]

Gas concentration length can be displayed in 5 types of volumetric flow rates (sl/min, scc/min, scc/sec, scf/min and scf/hr) and 4 types of mass flow rates (g/min, g/hr, mg/sec, lb/hr). The volume flow rate is prefixed with “s” (standard). This indicates that the standard conditions (70°F, 1 atm) defined by CGA (Compressed Gas Association) are used as the standard conditions required for conversion of volumetric flow rates and mass flow rates.

Applicable conditions

1) Sensitivity. (temperature difference between gas and background) The larger temperature difference between the gas and the background, the larger temperature change on the infrared image by the gas. And it increases the image sensitivity and accuracy of quantification. Conversely, when the temperature difference between the gas and the background is small, the quantification accuracy is degraded. Therefore, the system does not perform quantification when it determines that the temperature difference is less than 3°C (5.4 °F). In such a case, it is desirable to increase the temperature difference, such as by setting the background in a place exposed to sunlight or in the background of equipment in operation.

2) Gas type. At present, the technology supports 100% pure methane, propane or ethylene. Even in the case of gases other than the above three types or mixed gases, it is possible to grasp the relative magnitude of gas amount by measuring with the measurable gas types as long as the gas composition is the same.

3) Gas flow. Since this technology estimates the flow rate from the transit time of the gas, good accuracy can be obtained when the gas flows in one direction, as shown in Figure. 5-a. When the

gas scatters as shown in Figure. 5-b, it is desirable to take a longer video and utilize the results of the timing of gas flow in one direction.

[See DCN EPA-HQ-OAR-2019-0424-0179-A1 for Figure 5-a: a good flow and Figure 5-b: Difficult gas flow]

4) Temperature. Since the inputted temperature is regarded as the gas temperature, it is desirable to input the ambient temperature as accurately as possible. When using the camera, avoid placing it on the ground as this could pick up geothermal heat, or being exposed to continuous direct sunlight. The reason for this is the location of the camera thermometer being underneath the camera body.

5) Area designation. As shown in Figure 6-a, the area is set so as to enclose the width direction along the direction of gas movement. It doesn't matter if the leak source is included or not. Better accuracy can be obtained by enclosing the area as large as possible without noise. If the width direction is not completely enclosed as shown in Figure 6-b, the result may be miscalculated.

[See DCN EPA-HQ-OAR-2019-0424-0179-A1 for Figure 6-a: Good area designation and Figure 6-b: Bad area designation]

In addition, as shown in Figure. 7-a and 7-b, pixels appearing white in gas-enhanced (black and white) images other than gas itself are noise. It is desirable to specify an area that contains as little noise as possible by adjusting the shooting position. If the system determines that it is noisy, no quantification is performed.

[See DCN EPA-HQ-OAR-2019-0424-0179-A1 for Figure 7-a Noise example- gas shadow and Figure 7-b Noise example – moving object]

6) Distance. Accurate input is desirable because the error in the distance affects the square of the error (as an area) when calculating the gas amount from gas concentration length.

7) Shooting condition. To avoid vibration noise, make sure the camera is in a stable environment. A tripod is preferred. The magnitude of vibration noise can be confirmed on the gas-enhanced image. As shown in Figure 8-b, when the gas cannot be seen due to white noise caused by vibration, accurate estimation is difficult. In that case, stabilize the camera so that it appears as shown in Figure 8-a.

[See DCN EPA-HQ-OAR-2019-0424-0179-A1 for Figure 8-a: Good example and Figure 8-b: Bad example]

8) Calibration. This technology does not require calibration.

We created an in-house experimental environment to conduct the evaluation as shown in Figure 9. Multiple quantifications were performed while changing the amount of methane released and the distance to the source. The amount of release was controlled with a mass flow meter. As shown in Figure 10, the average values of each experiment, after eliminating abnormal values due to wind and noise, were within the variation of 0 to 60% of the actual flow rate.

[See DCN EPA-HQ-OAR-2019-0424-0179-A1 for Figure 9: Built Experimental Environment]

Furthermore, we quantified leaks detected at an actual producing facility with the GMP02 and compared the result with a high-flow sampler being used by the host operators. The results are shown in Figure 11. We have plans on conducting more field validations with additional O&G operators.

[See DCN EPA-HQ-OAR-2019-0424-0179-A1 for Figure 10: In house experimental result]

As long as the previously mentioned applicable limitations are kept in mind, this technology is widely suitable for a number of scenarios. The video captured by the OGI camera is easily quantifiable, after wirelessly connecting the camera to any tablet or mobile phone. Since the method of quantification is image-based and embedded within the camera, it is possible to estimate emission amounts in high places, inaccessible hazardous areas, and even indoor emissions.

We've also confirmed through several site evaluations that the quantified emissions differ for the same components such as valves and flanges. We believe that this indicates the need to take more effective actions by determining priorities according to the actual situation and thermal conditions.

We urge the EPA to consider the image-based quantification as an alternative technology to conventional equipment, that could contribute to further emission reduction.

Footnotes

[1] "US20220034742 - GAS FLOW RATE ESTIMATION DEVICE, GAS FLOW RATE ESTIMATION METHOD, AND GAS FLOW RATE ESTIMATION PROGRAM" https://patentscope.wipo.int/search/en/detail.jsf?docId=US349429229&_fid=WO2020110411

[2] "US20180364185 - GAS CONCENTRATION-THICKNESS PRODUCT MEASUREMENT DEVICE, GAS CONCENTRATIONTHICKNESS PRODUCT MEASUREMENT METHOD, AND COMPUTER-READABLE RECORDING MEDIUM HAVING GAS CONCENTRATION-THICKNESS PRODUCT MEASUREMENT PROGRAM RECORDED THEREON" https://patentscope.wipo.int/search/ja/detail.jsf?docId=US235210241&_fid=WO2017104607

Commenter Name: Not provided
Commenter Affiliation: GTI Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0198-A1
Comment Excerpt Number: 3

Comment Excerpt: Handheld laser methane detectors may be useful additions to optical gas imaging and Method 21 scans in upstream natural gas operations. EPA has requested comment on additional methods or advanced technologies that can identify individual leaking components under the "Equipment Leak Surveys" category. In 2020, GTI Energy released a study, "Evaluation of Handheld Laser Methane Detection Technologies"® that evaluated five handheld

laser based methane detection sensors. The study report has been provided as part of the GTI Energy submitted comments. One key advantage of these sensors is that they are methane specific and produce a concentration in ppm-m that can be used to gauge potential safety issues in the area. The methane specific detection, however, can also be a disadvantage if the goal is to locate emissions of VOCs more broadly. Regardless, research into the applicability of these sensors in natural gas segments beyond natural gas distribution could be useful.

Commenter Name: Not provided
Commenter Affiliation: GTI Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0198-A2
Comment Excerpt Number: 1

Comment Excerpt: [Commenter submitted the document "Improving Methane Emission Estimates for Natural Gas Distribution Companies Phase 4 — Activity Data," Gas Technology Institute, October 11, 2016. Document is a study consisting of six surveyed member distribution companies to develop improved activity data for natural gas distribution pipelines. Study consists of an examination of the Total Equivalent Leaks (TEL) equation with updated factors and an updated equivalent leaks ratio. Study concludes that company data are recommended over factors derived from the consolidated survey results. However, where company data are not available, the recommended activity data derived from this survey effort are provided in the table below. The results presented through this analysis provide current information on the frequency of buried natural gas distribution pipeline leaks. The resulting activity data can be paired with leak-based emission factors developed by GTI (GTI,2013) to result in estimates of GHG emissions from buried pipelines.]

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 15

Comment Excerpt: It is vitally important that, whenever possible, federal agencies coordinate regulations where actions to reduce and measure emissions align with actions to operate safe natural gas transmission and distribution systems.

In addition to the changes EPA is proposing in this docket, there are other federal and state agencies that are addressing greenhouse gas emissions and actions companies must take to reduce, eliminate, measure, and report these emissions. In some instances, these mandatory rules can create conflicts as well as redundancy for the companies trying to comply. For example, some of the EPA rules and the PHMSA rules overlap. In the PHMSA Pipes Act of 2020,[16] new

and existing gas distribution pipeline operators will be required to use advanced leak detection technologies and practices through continuous monitoring on or along the pipeline, through periodic surveys with handheld equipment or equipment mounted on mobile platforms, or other means using commercially available technology. Duke Energy encourages EPA and PHMSA to work together to coordinate how companies can comply with both sets of regulations while providing safe, reliable, affordable gas service to our customers and reduce emissions.

Footnotes

[16] Protecting our Infrastructure of Pipelines and Enhancement Safety Act of 2020, Sec. 113, Leak Detection and Repair.

A-14. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for equipment leaks by population count

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 52

Comment Excerpt: We strongly support EPA's proposal to include new population emission factors that are on a per major equipment basis rather than a per component basis. We believe that providing emission factors on a major equipment basis instead of by component would reduce reporter error by eliminating the step of estimating the number of components, and that use of major equipment factors should be required whenever it is possible. We also believe this would reduce reporter burden and reduce the number of errors in the calculation of emissions, leading to better overall emissions estimates. Finally, we conditionally support EPA's proposal to provide additional equipment emission factors based on the Pacsi and Zimmerle studies for more pieces of equipment than are currently included in subpart W. We believe this is a near-term improvement, but we note some deficiencies with relying solely on these two studies below.

While proposed emission factors derived from the Pacsi and Zimmerle studies represent an improvement from the existing and outdated emission factors, they still do not adequately account for intermittent, large emission events. For the emission factors to lead to accurate estimates, they must account for the infrequent, large emission events that characterize oil and gas emissions. We recommend that EPA consider future revisions to emissions factors that better represent the heavy-tailed emission distribution discussed in detail above.

Rutherford et al. (2021) provides an example for how large emission events can be accounted for using a bottom-up emission factor approach.[124] The Rutherford model accounts for these events when developing emission factors using a bootstrap resampling statistical approach. EPA cites this study alongside Zimmerle et al., 2020 and Pacsi et al., 2019, as "provid[ing] the necessary data to develop and compare study estimated population emission factors as well as study-estimated default component counts per major equipment to those in subpart W."[125] But then EPA relies only on the Zimmerle and Pacsi studies for its proposed emission factors even though

the Rutherford study is based on greater measurement data and robustly accounts for infrequent, large emission events. We recommend that EPA account for large intermittent emission events when revising emission factors.

The Rutherford study and estimation tool undertakes two sequential extrapolations: first from the component to the equipment-level, and second from the equipment to the national or regional-level.[126] The approach utilized in the bottom-up estimation tool begins with a database of component-level direct emissions measurements (*e.g.*, component-level emission factors). The authors generate component-level emission factor distributions from a literature review building on prior work and adding new publicly available quantified measurements. The resulting database includes around 3,700 measurements from six studies across a 12-fold component classification scheme. They then derive equipment-level emission factors through random resampling (*i.e.*, bootstrapping, with replacement) from the component-level database according to component counts per equipment and fraction of components emitting. Some of the studies relied on by Rutherford et al. also calculate equipment-level emission factors, but these are not used as inputs. Instead, the authors take the combined component-level emission data, component counts, and fraction of components found to be leaking, and derive values different from the values calculated in the underlying studies. The authors then use these emission factors to construct a bottom-up inventory that largely aligns with the top-down literature and estimates.

The Rutherford estimation tool provides a useful example of how emission factors can be derived that reflect and align with top-down literature and observed emissions. For the default subpart W emission factors to provide useful estimates that give an accurate picture of actual observed emissions, it is critical they incorporate super-emitter events. If they do not, the reporting program could disincentivize operators from using advanced measurement technologies and reporting better data because doing so will lead to higher reported emissions than they would calculate using the existing and proposed emission factors.

Below we include a standardized comparison of EPA's proposed emission factors, based on the Pacsi and Zimmerle studies, and the emission factors from the Rutherford study (averaged marginal and nonmarginal). As shown, the Rutherford emission factors are significantly higher because they account for large, intermittent emission events and align with actual observed emissions.

Natural gas sites.

Equipment Type *not a direct equipment type comparison	Rutherford EF - Average (scf/hr)	GHGRP EF (scf/hr)
Wellhead	8.6	0.59
Separator	8.87	0.84
Meters/piping*	7.04	2.8
Compressor	14.61	10
Dehydrator	6.78	3.1
Heater Treater*	6.52	0.12
Storage Vessel	Multiple EFs	0.85

Oil sites.

Equipment Type *not a direct equipment type comparison	Rutherford EF (scf/hr)	GHGRP EF (scf/hr)
Wellhead	3.91	0.59
Separator	4.17	0.43
Meters/piping*	7.04	2.5
Compressor	N/A	10
Dehydrator	N/A	3.1
Heater Treater*	2.87	0.35
Storage Vessel	Multiple EFs	0.56

Footnotes

[124] Rutherford et al., supra note 59.

[125] Subpart W TSD at 46.

[126] See Rutherford et al., supra note 59.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 14

Comment Excerpt: We strongly support EPA's proposal to include new population emission factors that are on a per major equipment basis rather than a per component basis. Providing emission factors on a major equipment basis instead of by component would reduce reporter error by eliminating the step of estimating the number of components, and that use of major equipment factors should be required whenever it is possible. This would reduce reporter burden and reduce the number of errors in the calculation of emissions, leading to better overall emissions estimates. And finally, we conditionally support EPA's proposal to provide additional equipment emission factors based on the Pacsi and Zimmerle studies for more pieces of equipment than are currently included in subpart W, but we note some deficiencies with relying solely on these two studies below.

While proposed emission factors derived from the Pacsi and Zimmerle studies represent an improvement from the existing and outdated emission factors, they still do not adequately account for intermittent, large emission events. For the emission factors to lead to accurate estimates, they must account for the infrequent, large emission events that characterize oil and gas emissions. We recommend that EPA consider revisions to emissions factors that allow for statistical incorporation of these emissions in order to lead to accurate estimates.

Rutherford et al., 2021 provides an example for how large emission events can be accounted for using a bottom-up emission factor approach. The Rutherford model accounts for these events when developing emission factors using a bootstrap resampling statistical approach. EPA cites this study alongside Zimmerle et al., 2020 and Pacsi et al., 2019, as "provid[ing] the necessary data to develop and compare study-estimated population emission factors as well as study estimated default component counts per major equipment to those in Subpart W."[58] But then EPA relies only on the Zimmerle and Pacsi studies for its proposed emission factors even though the Rutherford study is based on greater measurement data and robustly accounts for infrequent, large emission events. We recommend that EPA adopt emission factors that account for large intermittent emission events using statistical methods when developing emission factors. The failure to account for these emissions will lead to inaccurate underestimation of emissions.

The Rutherford study and estimation tool undertakes two sequential extrapolations: first from the component to the equipment-level, and second from the equipment to the national or regional level. The approach utilized in the bottom-up estimation tool begins with a database of component-level direct emissions measurements (*e.g.*, component-level emission factors). The authors generate component-level emission factor distributions from a literature review building on prior work and adding new publicly available quantified measurements. The resulting database includes around 3700 measurements from six studies across a 12-fold component classification scheme. They then derive equipment-level emission factors through random resampling (*i.e.*, bootstrapping, with replacement) from the component-level database according to component counts per equipment and fraction of components emitting. Some of the studies relied on by Rutherford et al. also calculate equipment-level emission factors, but these are not used as inputs. Instead, the authors take the combined component-level emission data, component counts, and fraction of components found to be leaking, and derive values different from the values calculated in the underlying studies. The authors then use these emission factors to construct a bottom-up inventory that largely aligns with the top-down literature and estimates

The Rutherford estimation tool provides a useful example of how emission factors can be derived that reflect and align with top-down literature and observed emissions. For the default emission factors to provide useful estimates that give an accurate picture of actual observed emissions, it is critical they incorporate super-emitter events. If they do not, the reporting program will disincentivize operators from using advanced measurement technologies and reporting better data because doing so will lead to higher reported emissions than they would calculate using the existing and proposed emission factors.

Below we include a standardized comparison of EPA's proposed emission factors, based on the Pacsi and Zimmerle studies, and the emission factors from the Rutherford study (averaged marginal and non-marginal). As shown, the Rutherford emission factors are significantly higher because they account for large, intermittent emission events and align with actual observed emissions.

Table 4. Population Emissions factors at natural gas sites.

Equipment Type *not a direct equipment type comparison	Rutherford EF - Average (scf/hr)	GHGRP EF (scf/hr)
Wellhead	8.6	0.59

Separator	8.87	0.84
Meters/piping*	7.04	2.8
Compressor	14.61	10
Dehydrator	6.78	3.1
Heater Treater*	6.52	0.12
Storage Vessel	Multiple EFs	0.85

Table 5. Population Emissions factors at oil sites.

Equipment Type *not a direct equipment type comparison	Rutherford EF (scf/hr)	GHGRP EF (scf/hr)
Wellhead	3.91	0.59
Separator	4.17	0.43
Meters/piping*	7.04	2.5
Compressor	N/A	10
Dehydrator	N/A	3.1
Heater Treater*	2.87	0.35
Storage Vessel	Multiple EFs	0.56

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 9

Comment Excerpt: Equipment Leak by Population Count. Under the GHGRP as it stands without the proposed revisions, leaks at un-surveyed sites are estimated using population counts provided in Subpart W. It is PBPA's understanding that the EPA, in the proposed revisions, is not arguing that the current factors are incorrect, but instead is proposing a new set of factors based on the Zimmerle and Pacsi studies previously referenced in these comments. These new leak factors use the same studies as the Equipment Leak Surveys factors and are therefore subject to the same criticisms of those surveys. However, the newly proposed method of assigning a leak rate to each major equipment type and service instead of assigning different component counts to major equipment based on their location will simplify the process of calculating emissions for this category. While PBPA would recommend more studies be conducted to confirm the findings of the Zimmerle and Pacsi studies, we do think assigning leak rates to major equipment directly is a positive change.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 38

Comment Excerpt: Table W–1a is being revised to list equipment leak emission factors per major equipment type, rather than per component. This change impacts the Onshore Petroleum and Natural Gas Production and Onshore Petroleum and Natural Gas Gathering and Boosting segments. EPA is implementing this change to eliminate an unnecessary step where major equipment types are converted to component counts, which are in turn used with per component emission factors to calculate emissions. EPA seeks comment on the approach of providing population count emission factors by major equipment.

Although this revision will eliminate an unnecessary calculation step for many reporters, it also eliminates the option to use actual component counts per facility to calculate equipment leak emissions. 40 C.F.R. § 98.233(r)(2) currently allows both "Component Count Method 1" — counting major equipment; and "Component Count Method 2" — counting individual components. The option to use actual individual component counts to calculate emissions should be retained as it will provide more accurate emission estimates compared to using major equipment counts. Table W–1a should include both emission factors per major equipment type and per component count to allow for either option to continue to be used.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 7

Comment Excerpt: The changes to the default population emission factors for natural gas distribution protected and unprotected steel main are not credible and not supported by the data.

EPA is proposing changes to the emission factors for natural gas pipelines[7] utilizing combined data from the Lamb study[8] and the Weller study.[9] EPA is combining the equivalent leaks from the Weller study with the leak measurements from the Lamb study to develop the pipeline mains emission factors. But EPA's reasoning to combine this study data is not rational or scientific.

The Lamb study was comprised of 230 individual pipeline leak measurements from 13 local distribution companies that were geographically diverse and contained similar distribution of pipeline materials as the national average. The Lamb study leak measurements were adopted by EPA in 2016 to establish emission factors for distribution emission sources in the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 — 2014. The Weller study combines the use of mobile surveying with high-sensitivity instruments and data processing algorithms to identify,

locate, and estimate emissions. The Weller study assumes that leaks detected in proximity of natural gas pipelines reflect leaks from the pipeline mains and no other sources. The survey data were combined with pipeline GIS information obtained from four urban areas to estimate activity factors. The Weller study then calculates leak indications and assigns them to pipeline materials, then fit a Bayesian Poisson regression model to estimate leak indication rate by pipeline material and age. The Weller study creates higher emission factors, which the authors hypothesize is due to their larger sample size. However, because the study was conducted only in urban areas where there are many sources of interference that would not be present in less densely populated or rural areas, the study itself maybe significantly overestimating the impact of pipeline leak rates, and the results should not be broadly applied to pipelines in other geographic regions. It also appears that the study was limited to testing using vehicle-based (automobiles) advanced methane leak detection (AMLD) technology, which would further restrict the testing to pipelines along or near roadways and other paved surfaces, thereby further limiting the representativeness of the study.

Footnotes

[7] Table W–8 to Subpart W, Default Methane Population Emission Factors for Natural Gas Distribution.

[8] Lamb, B.K., S.L. Edburg, T.W. Ferrara, T. Howard, M.R. Harrison, C.E. Kolb, A. Townsend-Small, W. Dyck, A. Possolo, and J.R. Whetstone, "Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States." Environ. Sci. Technol, 2015, 49(8), 5161- 5169, available at https://doi.org/10.1021/es505116p.

[9] Weller, Z.D., S.P. Hamburg, J.C. von Fischer, "A National Estimate of Methane Leakage from Pipeline Mains in Natural Gas Local Distribution Systems." Environ. Sci. Technol. 2020, 54(14), 8958-8967, available at https://dx.doi.org/10.1021/acs.est.0c00437.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 8

Comment Excerpt: In combining the two studies, EPA is proposing to change the emissions factor for protected steel main from 0.35 to 2.3, while reducing the emission factor for unprotected steel main from 12.58 to 1.2. EPA states that the sample size in the Weller study with respect to equivalent leaks is an advantage over the Lamb study. However, the manner in which the Weller study formulates the number of leaks is not based on actual leak data specific to actual pipeline materials or over a broader geographical representation of pipeline systems. Additionally, the Weller study assumes all leaks detected near natural gas pipelines are leaks from the gas pipeline. Duke Energy's own pilot research in AMLD leak detection and subsequent ground validation has suggested that this is not a viable assumption—particularly over such a small sample area with little geographic diversity that does not include both urban and rural areas. It is important, therefore, that any study used to establish leak rates for natural

gas pipelines must take care to investigate and confirm the actual source of any observed methane leak and identify the pipe material. The Weller study does not do this, and the conclusions from that study are not reliable (and are clearly not reasonable) and should not be considered for setting pipeline leak factors.

The resulting emission factors for protected and unprotected steel gas pipeline mains is not credible and is not supported by the data. It is nonsensical to suggest that protected steel natural gas pipelines are higher emitters than nonprotected steel natural gas pipelines. The Pipeline and Hazardous Material Safety Administration (PHMSA) addresses bare steel pipe inventory in the Bare Steel Inventory Report,[10] which demonstrates a growing decrease in the miles of bare steel natural gas pipe. This is primarily as a result of the recognition that bare steel pipe is more leak prone than protected steel pipe and many states and gas utilities have implemented integrity management programs to replace bare steel pipe with protected steel pipe.

EPA itself has encouraged the replacement of cast iron and unprotected steel mains as a mitigation option to reduce leaks as part of the EPA Methane Challenge program.[11] For example, Figure 1 below shows the reduction in leaks across the Duke Energy Ohio and Duke Energy Kentucky natural gas systems attributed to pipeline mains from 2000 through 2015 as reported to EPA under the Methane Challenge program. [See DCN EPA-HQ-OAR-2019-0424-0185-A1 for Figure 1].

If EPA proceeds with revisions to Subpart W in this rulemaking, Duke Energy urges EPA to either retain the current pipeline leak factors and leak frequency data or adopt factors based on the Lamb study. However, Duke Energy believes that the additional uncertainty in how to use the results of the Lamb and Weller studies should cause EPA to pause on these significant changes and instead address any changes in the additional rulemaking EPA will be pursuing under the requirements of the IRA, as discussed in our comments.

Footnotes

[10] PHMSA Bare Steel Inventory Report Oracle BI Interactive Dashboards - GD Bare Steel (dot.gov).

[11] Methane Challenge Program BMP Commitment Option Technical Document, 2022 Update, p. 24 (https://Awww.epa.gov/system/files/documents/2022-05/MC_BMP_TechnicalDocument_2022-05.pdf).

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA's proposal to blend the direct flow measurements from the Lamb Study [12] with the calculated leak frequency estimates from the Weller Study' [13] yields results that are significantly inconsistent with all other previous studies. It is well-known from previous

studies and experience that unprotected steel pipe has more leak emissions than modern cathodically protected steel. Both the 1996 GRI-EPA [14] study and Lamb Study demonstrate this emissions differential. Furthermore, EPA's voluntary Methane Challenge program incentivizes natural gas distribution companies or municipalities to replace unprotected steel pipe with cathodically protected steel pipe. EPA's Proposed Rule would undermine that incentive because it would establish a higher default emission factor for protected steel than for unprotected steel mains. See 87 Fed. Reg. at 36,981-82 (preamble) and proposed Table W–8, at 37,105 (1.2 scf/hr for unprotected steel mains) vs. 2.3 scf/hr for protected steel mains).

EPA contends both studies have their advantages: the Lamb Study's advantage is its methodology — using direct measurements with a high-volume sampler, and, the Weller Study's advantage is its larger sample size. While the Weller study may have a larger sample size, numerous limitations preclude it from being used as a basis for revisions to the default emission factors for distribution mains. Simply stated, the Weller Study is not a reasonable basis for establishing national default emission factors.

First, and most importantly, the Weller Study conflated cathodically unprotected coated steel in the "coated (protected)" steel emission factor Category and did not verify pipe type, material, or cathodic protection. The Weller Study authors did not obtain information about or verify whether pipe was cathodically protected. As a result, no distinction between cathodically protected and unprotected steel pipe is made. This means leak data for more leak prone cathodically unprotected (but coated) steel is arbitrarily combined in the "coated (protected)" category for calculating emission factors. The Weller Study authors failed to explain why their data indicated more leaks per mile for coated steel pipe than for bare steel pipe. This failure to distinguish cathodic protection is likely a large part of the answer to why the findings in the Weller Study are counterintuitive.

Steel pipe can be protected through cathodic protection and/or coating. Natural gas distribution pipeline operators annually report miles of steel pipe to the DOT PHMSA in four categories: cathodically protected coated pipe, cathodically protected uncoated pipe, coated steel pipe that is not cathodically protected and bare steel that is not cathodically protected. EPA's Subpart W default emission factors for steel pipe account for only two categories: protected and unprotected steel pipe, referring to steel pipe that is or is not cathodically protected.

The Weller Study also did not verify the type of pipe — distribution main or service line. The authors conceded they assumed all emissions to be caused by mains. As the authors explained: "We assume that the leak indications and emissions observed in these surveys are derived from leaks in the gas mains ... [a]lthough some of these leaks may arise from service lines or meter set assemblies..."[15] As a result, main leak factors were inflated because emissions from services were not separated from the emissions assigned to distribution mains.

Verification of pipe material is important, as demonstrated in a recent study conducted by GTI for the California Air Resources Board (CARB) to develop California utility-specific emission factors for mains and service lines.[16] The CARB-GTI Study used a similar data collection and verification method as used in the Lamb Study. Field visits were conducted in the service territories of the three largest natural gas distribution utilities in California, using a high-volume sampler to measure flow rates at leak locations randomly selected from each utility's list of

nonhazardous leaks, focusing on (cathodically) unprotected steel mains and services. As in the Lamb Study, pipe type, material and protection were verified.

"As part of the study, 78 leak sites were measured above ground. During the leak repairs by the utilities, about 1-3 years later, it was discovered that the original identifications of leak facility [pipe type] (mains vs services) or pipe material (plastic vs steel) were incorrectly classified 59% of the time. The facility and material were misclassified 40% and 31% of the time respectively."[17]

The methodology of the CARB-GTI Study included an advanced statistical and probabilistic analysis on the leak data and the misclassifications to provide a representation of the average leak rates for underground distribution mains and services by pipe type, material, and protection.[18]

During the Lamb Study, the authors had access to utility pipe material information and were able to verify pipe material, cathodic protection, and location on the main or service line when the utility excavated the pipe after the measurements to conduct repairs. Conversely the authors in the Weller Study were not able to identify the true pipe material and type of leak that was detected (main or service; cathodically protected or not). The Weller Study evaluated four types of pipe material: "bare steel," cast iron, "coated steel," and plastic. Such a categorization is insufficient to draw conclusions from the resulting data about appropriate default emission factors for cathodically protected or unprotected steel pipe. Bare steel pipe is pipe that lacks a coating — but it may not lack cathodic protection. Coated steel may have a coating, but it may lack cathodic protection. In other words, the Weller Study design at the outset did not actually attempt to provide emissions estimates for protected or unprotected steel pipe.

In addition, in the Weller Study, other materials were aggregated with one of the other four categories. Copper pipe was included in the bare steel. Ductile iron was combined with cast iron. This lack of proper pipe material characterization in the Weller Study design significantly undermines its value for determining emissions factors for protected and unprotected steel pipe.

Footnotes

[12] Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States | Environmental Science & Technology (acs.org), Lamb et al., Environ. Sci. Technol. 2015, 49, 8, 5161-5169, (hereinafter, Lamb Study).

[13] A National Estimate of Methane Leakage from Pipeline Mains in Natural Gas Local Distribution Systems| Environmental Science & Technology (acs.org), Weller et al., Environ. Sci. Technol. 2020, 54, 14, 8958-8967 (hereinafter, Weller Study).

[14] Harrison et al., GRI-EPA, "Methane emissions from the Natural Gas Industry" (June 1996) (hereinafter, 1996 GRI-EPA Study).

[15] Weller Study, Section 2.2, p. 8960.

[16] Ersoy, Adamo, "Quantifying Methane Emissions from Distribution Pipelines in California," Final Report (Sept. 2019) ("CARB-GTI Study").

[17] Id. p. 1. See also p. 13 and Appendix A.

[18] Id. at p. 1.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 5

Comment Excerpt: Most importantly, the Weller Study conflated cathodically unprotected coated steel in the "coated (protected)" steel emission factor category and did not verify pipe type, material, or cathodic protection. The Weller Study authors did not obtain information about or verify whether pipe was cathodically protected. As a result, no distinction between cathodically protected and unprotected steel pipe is made. This means the leak data for more leak prone, cathodically unprotected (but coated) steel pipe is arbitrarily included in the "coated (protected)" category for calculating emission factors. The Weller Study authors failed to explain why their data indicated more leaks per mile for coated steel pipe (*i.e.*, 0.61 leaks/mi) than for bare steel pipe (*i.e.*, 0.51 leaks/mi), but this failure to distinguish cathodic protection is likely a large part of the answer to why the findings in the Weller Study are counterintuitive.

Steel pipe can be protected through cathodic protection and/or coating. Natural gas distribution pipeline operators annually report miles of steel pipe to the U.S. Department of Transportation (DOT) in four categories: (1) cathodically protected coated pipe; (2) cathodically protected uncoated pipe; (3) coated steel pipe that is not cathodically protected; and (4) bare steel pipe that is not cathodically protected. EPA's Subpart W default emission factors for steel pipe account for only two categories — protected and unprotected steel pipe — referring to steel pipe that is or is not cathodically protected. The lack of consistent categorization leads to misleading and inaccurate results.

The Weller Study also did not verify the type of pipe at the leak location — distribution main or service line. The authors conceded they assume all emissions to be caused by mains. As the authors explained: "We assume that the leak indications and emissions observed in these surveys are derived from leaks in the gas mains... [a]lthough some of these leaks may arise from service lines or meter set assemblies..."[5]

As a result, main leak factors were inflated because emissions from services were not separated from the emissions assigned to distribution mains.

Verification of pipe material is important, as demonstrated in a recent study conducted by GTI for the California Air Resources Board (CARB) to develop California utility-specific emission factors for mains and service lines.[6] The CARB-GTI Study used a similar data collection and verification method as used in the Lamb Study. Field visits were conducted in the service territories of the three largest natural gas distribution utilities in California, using a high volume sampler to measure flow rates at leak locations randomly selected from each utility's list of non-hazardous leaks, focusing on (cathodically) unprotected steel mains and services. As in the Lamb Study, pipe type, material, and protection were verified.

"As part of the study, 78 leak sites were measured above ground. During the leak repairs by the utilities, about 1-3 years later, it was discovered that the original identifications of leak facility

[pipe type] (mains vs services) or pipe material (plastic vs steel) were incorrectly classified 59% of the time. The facility and material were misclassified 40% and 31% of the time respectively."[7]

The methodology of the CARB-GTI Study included an advanced statistical and probabilistic analysis on the leak data and the misclassifications to provide a representation of the average leak rates for underground distribution mains and services by pipe type, material, and protection.[8]

During the Lamb Study, the authors had access to utility pipe material information and were able to verify pipe material, cathodic protection, and location on the main or service line when the utility excavated the pipe after the measurements to conduct repairs. Conversely the authors in the Weller Study were not able to identify the true pipe material and type of leak that was detected (main or service; cathodically protected or not). The Weller Study evaluated four types of pipe material: bare steel, cast iron, coated steel, and plastic. Such a categorization is insufficient to draw conclusions from the resulting data about appropriate default emission factors for cathodically protected or unprotected steel pipe. Bare steel pipe is pipe that lacks a coating, but it may not lack cathodic protection. Coated steel may have a coating, but it may lack cathodic protection. The Weller Study leaks are based on leak indication areas, not confirmed leaks, which grossly undermine the validity of the leak rates. In other words, the Weller Study design at the outset did not actually attempt to provide emissions estimates for protected or unprotected steel pipe. In addition, in the Weller Study, other materials were aggregated with one of the other four categories. Copper pipe was included in the bare steel. Ductile iron was combined with cast iron. This lack of proper pipe material characterization in the Weller Study design significantly undermines its value for determining emissions factors for protected and unprotected steel pipe.

Footnotes

[5] Weller Study at 8960

[6] Quantifying Methane Emissions from Distribution Pipelines in California, Final Report, Ersoy et al., September 2019 (the "CARB-GTI Study").

[7] Id. at 1. See also p. 13 and Appendix A.

[8] id. at.

Commenter Name: Brian Jones
Commenter Affiliation: Downstream Natural Gas Initiative
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0249-A1
Comment Excerpt Number: 2

Comment Excerpt: DSI does not support EPA's proposal to update the distribution main emission factors using the equivalent leaks per mile data from the Weller et al.[4] study (Weller Study). As detailed in the comments submitted by AGA/APGA, there are aspects of the methodology used in the Weller Study that make application of the Weller Study equivalent leak data inappropriate. The application of the Weller Study leaks per mile assumption results in an

emission factor for protected steel mains that is higher than the emission factor for unprotected steel mains. This is inconsistent with gas utility experience, other studies measuring methane emissions from distribution mains, and EPA programs aimed at reducing methane emissions such as Methane Challenge. In addition to the methodological problems in the Weller Study, DSI opposes the proposed emission factors for mains because of the implications they have for utility emissions reduction strategies.

Footnotes

[4] Weller et al. "A National Estimate of Methane Leakage from Pipeline Mains in Natural Gas Local Distribution Systems." Environmental Science & Technology. 10 Jun 2020. https://pubs.acs.org/doi/pdf/10.1021/acs.est.0c00437

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 8

Comment Excerpt: The Weller emission factors derived from the Weller Study are unreliable because the Weller Study methodology used minimal verification for leak locations. During the field campaign, the authors assumed that a leak indication within 40 meters of a pipeline must be a leak associated with the distribution pipeline — considering the wind direction measured at the vehicle. The study design did not consider the possibility of a different wind direction at the actual location of the leak or the effect of obstructions (such as trees or structures) between the vehicle and the actual leak location. These are commonly encountered phenomena for leak detection in the natural gas distribution industry, particularly when using AMLD.

The Weller Study clearly does not provide a rational basis in the rulemaking record for EPA to revise its national default emission factors so that lower-emitting cathodically protected steel mains appear to emit more than cathodically unprotected steel gas distribution mains. Such a revision would undermine efforts to reduce actual emissions by making it appear — inaccurately — that replacing protected steel with unprotected steel would reduce emissions when the evidence shows the reverse is true.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 9

Comment Excerpt: The Weller Study emission factors are unreliable because the study methodology used minimal verification for leak locations. During the field Campaign, the authors assumed that a leak indication within 40 meters of a pipeline must be a leak associated with the distribution main — taking into account the wind direction measured at the vehicle. The study design did not consider the possibility of a different wind direction at the actual location of the leak or the effect of obstructions, such as trees or structures between the vehicle and the actual leak location. Conversely, the equivalent leak rates determined by the National Grid Companies include in-ground verification of each of the over 160,000 leak repairs.

Additionally, associating a leak to the closest pipeline is not the best strategy in dense urban areas with many parallel mains and intersections. If all leaks in the study are associated with mains regardless of their source, which may include services, then company-wide emissions calculations will be double counted, since there is also a separate emission calculation associated with services. The Weller Study also failed to distinguish between biogenic and thermogenic sources of methane. This means the Weller Study may have included emissions from landfills, wetlands, sewers, and other biogenic sources rather than only leaks from the natural gas distribution systems, thereby inflating emissions and leak rates.

Based on all of the points discussed above, the Weller Study clearly does not provide a rational basis in the rulemaking record for EPA to revise its national default emission factors, which would result in lower-emitting, cathodically-protected steel mains appearing to emit more than cathodically-unprotected steel gas distribution mains. Such a revision would undermine efforts to reduce actual emissions by making it appear — inaccurately — that replacing protected steel with unprotected steel would reduce emissions when the evidence clearly shows the reverse is true.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 5

Comment Excerpt: The Weller Study has limited data from only four cities, not the 13 cities from across the country in different geographic areas that are included in the Lamb Study. The results from those four cities were extrapolated to construct nationwide assumed emissions rates. This lack of geographic diversity can introduce significant bias. The study also did not consider differences between urban, suburban, and rural areas.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 8

Comment Excerpt: The Weller Study has limited data from only four cities, not the 13 cities from across the country in different geographic areas that are included in the Lamb Study. The results from those four cities in the Weller Study were extrapolated to construct nationwide assumed emissions rates. This lack of geographic diversity can introduce significant bias. The Weller Study also did not consider differences among urban, suburban, and rural areas.

Additionally, the Weller Study conducted data collection efforts over a very short period of time, in which approximately 6,300 miles were surveyed. The National Grid Companies, on the other hand, have equivalent leak data collected over ten years from distribution systems that collectively measure in excess of 30,000 miles, which span rural, urban, and suburban environments.

[See DCN EPA-HQ-OAR-2019-0424-0238-A1 for Table: National Grid 10 Year History and Figure (pie chart): National Grid Main Inventory by main material.]

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 4

Comment Excerpt: The "advanced mobile detection platform" (AMLD) methodology used in the Weller Study shows great promise for the development of system-specific emission factors, but it is not an appropriate tool for assessing emission factors for specific types of pipe material. There are now many tools in the methane detection and quantification toolbox, and it is important to pick the appropriate tool or mix of tools for the job at hand. AMLD can be quite useful when used to identify and fix medium and larger-volume non-hazardous leaks. As discussed later regarding company/utility-level system emissions quantification, AMLD can also be quite useful to quantify overall emissions from all leaks from a company's entire distribution system — when deployed with multiple passes of the mobile platform (whether by car, drone, airplane, or satellite) in conjunction with a robust, statistically valid sample of direct measurement data. However, it is not the best tool for quantifying emissions from individual leaks from specific types of sources, such as distribution mains made of different pipe materials.

The methodology used in the Weller Study was initially developed in field studies as a screening tool to assign distribution leak plume detections to approximate leak rate categories of very low (4 to 9 CH_4 g/min.), low (10 to 36 g/min.), medium (37 to 182 g/min.) or high (>182 g/min.) for the purpose of prioritizing repairs for non-hazardous leaks that are relatively higher emitters. [19] Under DOT PHMSA pipeline safety regulations, 49 C.F.R. Part 192, natural gas distribution

pipeline operators fix hazardous leaks immediately. For safety purposes, leaks that are currently non-hazardous leaks are scheduled for timely repair, and leaks that are determined to have no potential to become hazardous are either repaired within a longer timeframe or placed on a leak log and monitored. However, for purposes of reducing methane emissions to help minimize climate impacts, our members are interested in methods for identifying those non-hazardous leaks that have relatively higher emissions so that these leaks can be prioritized for repairs. Our members have found the methodology used in the Weller Study is useful for that purpose — to categorize non-hazardous leaks into approximate categories of small, medium, and larger emitters. However, our members have found that this methodology is not suited for measuring actual emission flow rates from specific leaks from specific pipe materials.

A field study conducted by NYSEARCH and a large group of natural gas utilities in 2015, with additional validation tests in late 2017 and 2018 compared the results of three AMLD technologies (including two types of cavity ring down spectrometers technologies[20] — one of which was used in the Weller Study — coupled with modeling) with direct measurements of over 300 leaks using a high volume sampler.[21] The goal of the NYSEARCH Study, co-funded by DOT PHMSA, "was to define a process for independent validation of mobile methane emissions measurement technologies." [22] The results showed AMLD — could quantify leaks within very broad ranges, which is useful as a general tool for prioritizing leaks, but for example, not to provide accurate emissions measurements for reporting or inventory purposes to develop emission factors for different pipe materials. "One of the conclusions...was that the technologies that were evaluated had a wide range of accuracy and precision...and] data analysis showed that accuracy of the predicted vs. actual flow rate indicated a 77% accuracy shown to within one order of magnitude."[23] Stated simply, the NYSEARCH Study demonstrates that the AMLD methodology is not as accurate as using high volume samplers to measure the flow rate of specific leaks from specific types of pipe materials. [24]

While AMLD is not the best tool for developing population- based emission factors for different types of pipe, the NYSEARCH Study[25] noted that a previous report indicated that with repeated passes, mobile technologies such as AMDL (sic) can be useful in quantifying overall system emissions:

"Adam Brandt et al. (ii) have shown that more frequent surveys of gas systems even with less sensitive detection devices can substantially support methane emissions measurements. NYSEARCH data allows actual implementation of such an approach by defining quantitative uncertainties of mobile leak quantification systems in realistic conditions." [26]

However, the level of frequent surveying suggested by Adam Brandt et al. was not performed for the Weller Study.

Footnotes

[19] Higher emitting leaks in the distribution context are typically orders of magnitude lower than the "super emitters" in upstream operations, such as from stuck dump valves on separation tanks. This is reflected in the relatively low percentage of emissions from gas distribution as compared to other sectors of the natural gas supply chain. For example, EPA's Inventory of GHG Emissions and Sinks (1990-2020) published in April 2022 indicates that emissions from gas distribution in the U.S. contributed only 8.4 % of emissions from the natural gas sector. See AGA's analysis in

"Understanding the EPA GHG Inventory," p. 9, https://www.aga.org/research/reports/epaupdates-to-inventory-ghg/.

[20] The AMLD technologies evaluated in the NYSEARCH Study are described in D'Zurko and Mallia, "Measurement Technologies Look to Improve Methane Emissions," Pipeline & Gas Journal (Feb. 2018) at 55, https://pgjonline.com/magazine/2018/february-2018-vol-245-no-2/features/measurement-technologies-look-toimprove-methane-emissions.

[21] https://www.nysearch.org/white-papers/Validation-Methods-for-Methane-Emissions-QuantificationTechnologies-Final.pdf (Oct. 2020) (hereinafter NYSEARCH Study).

[22] Id. P. 2.

[23] NYSEARCH Study, p. 1 referencing Figure 1.

[24] Id.

[25] NYSEARCH Study p.5.

[26] Id at 5, quoting Chandler E. Kemp, Arvind P. Ravikumar, and Adam R. Brandt "Comparing Natural Gas Leakage Detection Technologies Using an Open-Source 'Virtual Gas Field' Simulator," Environ. Sci. Technol. 2016, 50, 4546-4553.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 7

Comment Excerpt: The "advanced mobile leak detection platform" (AMLD) methodology used in the Weller Study shows great promise for the development of system specific emission factors, but it is not an appropriate tool for assessing emission factors for specific types of pipe material. There are now many tools in the methane detection and quantification toolbox, and it is important to pick the appropriate tool or mix of tools for the job at hand. AMLD can be quite useful when used to identify and fix medium and larger-volume non-hazardous leaks. AMLD can also be useful to quantify overall emissions from all leaks from a company's entire distribution system — when deployed with multiple passes of the mobile platform (whether by car, drone, airplane, or satellite) in conjunction with a robust, statistically valid sample of direct measurement data. However, it is not the best tool for quantifying emissions from individual leaks from specific types of sources, such as distribution mains made of different pipe materials. Additionally, the method identifies all methane emissions and does not discriminate between biomethane and natural gas.

The methodology used in the Weller Study was initially developed in field studies as a screening tool to assign distribution leak plume detections to approximate leak rate categories of very low (182 CH_4 grams/minute) for the purpose of prioritizing repairs for non-hazardous leaks that are relatively higher emitters.[9] Under the DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) pipeline safety regulations, 49 C.F.R. Part 192, natural gas distribution pipeline operators fix hazardous leaks immediately. For safety purposes, leaks that are currently non-hazardous but are determined that they may become a probable future hazard are scheduled

for timely repair, and leaks that are determined to have no potential to become hazardous are either repaired within a longer timeframe or placed on a leak log and monitored. However, for purposes of reducing methane emissions, LDCs are interested in methods for identifying those non-hazardous leaks that have relatively higher emissions so that these leaks can be prioritized for repairs. The methodology used in the Weller Study has been found to be useful for that purpose — to categorize non-hazardous leaks into approximate categories of low, medium, or high emitters. However, this methodology has been found to be not suited for measuring actual emission flow rates from specific leaks from specific pipe materials.

A field study conducted by NYSEARCH and a large group of natural gas utilities in 2015, with additional validation tests in late 2017 and 2018, compared the results of three AMLD technologies (including two cavity ring down spectrometer technologies[10] coupled with modeling, including the one used in the Weller Study) with direct measurements of over 300 leaks using a high-volume sampler.[11] The goal of the NYSEARCH Study, co-funded by DOT PHMSA, "ways to define a process for independent validation of mobile methane emissions measurement technologies." [12] The results showed AMLD could quantify leaks within very broad ranges, which is useful as a general tool for prioritizing leaks, but not to provide accurate emissions measurements for reporting or inventory purposes or to develop emission factors for different pipe materials. "One of the conclusions ... was that the technologies that were evaluated had a wide range of accuracy and precision ... [and] data analysis showed that accuracy of the predicted vs. actual flow rate indicated a 77% accuracy shown to within one order of magnitude."[13] Stated simply, the NYSEARCH Study demonstrates that the AMLD methodology is not as accurate as using high-volume samplers to measure the flow rate of specific leaks from specific types of pipe materials.[14]

While AMLD is not the best tool for developing population-based emission factors for different types of pipe, the NYSEARCH Study noted that a previous report indicated that with repeated passes, mobile technologies such as AMLD can be useful in quantifying overall system emissions:

"Adam Brandt et al. (ii) have shown that more frequent surveys of gas systems even with less sensitive detection devices can substantially support methane emissions measurements. NYSEARCH data allows actual implementation of such an approach by defining quantitative uncertainties of mobile leak quantification systems in realistic conditions."[15]

However, the level of frequent surveying suggested by Adam Brandt et a/. was not performed for the Weller Study. The high level of variability in the charts below (from the Weller Study) for equivalent leaks per mile for cast iron and coated steel pipes prove that a larger dataset is required. The charts indicate that cast iron equivalent leaks per mile vary from ~0.2 leaks per mile to ~5 leaks per mile. Coated steel is similarly variable, ranging from ~0.01 leaks per mile to ~2 leaks per mile. Additionally, the data collected represents a single point in time and does not reflect the lifelong emissions of a leaking facility due to changes in underground conditions (*e.g.*, rain, seasons, etc.).

[See DCN EPA-HQ-OAR-2019-0424-0238-A1 for figure of four graphs comparing Bare Steel, Cast Iron, Coated Steel, and Plastic against log (Leaks/Pipeline/Mile)]

Footnotes

[9] Higher emitting leaks in the distribution context are typically orders of magnitude lower than the "super emitters" in upstream operations, such as from stuck dump valves on separation tanks. This is reflected in the relatively low percentage of emissions from gas distribution as compared to other sectors of the natural gas supply chain. For example, EPA's Inventory of GHG Emissions and Sinks (1990-2020) published in April 2022 indicates that emissions from gas distribution in the U.S. contributed only 8.4 %of emissions from the natural gas sector. See AGA's analysis in "Understanding the EPA GHG Inventory," p. 9, https://Awww.aga.org/research/reports/epa-updates-to-inventory-ghg/.

[10] The AMLD technologies evaluated in the NYSEARCH Study are described in D'Zurko and Mallia, "Measurement Technologies Look to Improve Methane Emissions," Pipeline & Gas Journal (February 2018) at 55, https://pgjonline.com/magazine/2018/february-2018-vol-245-no-2/features/measurement-technologies-look-toimprove-methane-emissions.

[11] https://www.nysearch.org/white-papers/Validation-Methods-for-Methane-Emissions-QuantificationTechnologies-Final.pdf (October 2020) (the "NYSEARCH Study").

[12] Id. at 2.

[13] Id. at 1, referencing Figure 1.

[14] Id.

[15] Id at 5, quoting Chandler E. Kemp, Arvind P. Ravikumar, and Adam R. Brandt "Comparing Natural Gas Leakage Detection Technologies Using an Open-Source 'Virtual Gas Field' Simulator," Environ. Sci. Technol. 2016, 50, 4546-4553

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 6

Comment Excerpt: When comparing the National Grid Companies' ten-year leak history, which includes over 160,000 leak repairs with verified materials from over 30,000 miles of pipeline, there is a significant discrepancy in the calculated equivalent leaks per mile compared to the Weller Study, as shown below:

	Weller Study (Leaks per Mile)	**National Grid (Leaks per Mile, 10 Year Average)**
Cast Iron	1.00	1.71
Unprotected Steel	0.51	0.37
Protected Steel	0.61	0.07
Plastic	0.43	0.01

It should be noted that the leak incidences included in the table above for the Weller Study are based on only 6,298 miles surveyed while the National Grid Companies surveyed 32,650 miles.

When taking into account the age-related failure mechanisms observed on most pipelines, one would expect to see a larger difference in leaks per mile when comparing plastic pipe to unprotected steel, similar to the National Grid Companies' data. In fact, when comparing the National Grid Companies' plastic leaks per mile to the Weller Study results, the Weller Study estimates a frequency that is 43 times greater. The likely explanation is that dense urban areas tend to have the oldest, most vulnerable pipe and are often targeted aggressively by local distribution companies (LDCs) for pipe replacement programs with plastic. As a result, plastic pipe is quite often in very close proximity to the more leak prone materials either as a parallel main or at intersections. When the Weller Study associated the leak location with the closest main material, it is entirely possible that plastic was closest, but the source was actually from a nearby pipe material that is more leak prone.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 6

Comment Excerpt: The Weller Study exhibited a high degree of uncertainty. The Weller Study showed that the AMLD methodology was unable to document a high degree of correlation between field results and control test results. There were two to three orders of magnitude difference in flow rates between the author's predicted emission rates and confirmed actual emission rates during in-field validation studies. These validation studies were carried out using tracer-ratio methods, enclosure, and high-volume sample methods, and controlled metered releases.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 7

Comment Excerpt: The Weller Study did not distinguish between biogenic and thermogenic sources of methane. This means the Weller Study may have included emissions from landfills, wetlands, sewers, and other biogenic sources rather than only leaks from the natural gas distribution systems, thereby inflating emissions and leak rates.[27]

Footnotes

[27] See Weller Study, section 2.2, p. 8960, noting that the authors "used the methane concentration data to develop NG leak indications consisting of the location of a potential leak and an estimate of its size. These data products were derived from the survey data using a set of data-processing algorithms, described in work of Weller et al. 2019." The reference in footnote 19 of the Weller Study leads to section 4.2 of the 2019 Weller et al. study, which states in paragraph 4 of section 4.2: "First, we do not distinguish between thermogenic and biogenic CH_4 sources, but this capability could be added by analyzing both CH_4 and ethane concentrations." There is no reference to using methane to ethane ratios in the Weller Study published in 2020.

Commenter Name: Alex Bond
Commenter Affiliation: Edison Electric Institute (EEI)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0219-A2
Comment Excerpt Number: 5
Excerpt Status: Not Started

Comment Excerpt: EPA's new proposed methodologies regarding leak rates from new pipelines made from updated materials result in an increase in the estimates of the leak rates for methane from certain infrastructure. This results in the surprising and unsupported conclusion that new materials have higher leak rates and thus a greater impact in terms of methane leaks than existing infrastructure. This runs counter to the experience of EEI's members, who work with partners across the natural gas supply chain to decrease leakage rates, often through targeted replacement of existing and aging infrastructure. EPA should reevaluate its emissions factor approach for new pipeline infrastructure in order to ensure consistency across the application of those factors, so as not to inadvertently create a framework that penalizes new infrastructures that has lesser leakage concerns than existing infrastructure.

Commenter Name: Amy D. Kapuga
Commenter Affiliation: Consumers Energy Company
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0221-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA's proposed revisions to the default population-based emission factors for Natural Gas Distribution Mains are not credible, not supported by the record, and would undermine efforts to reduce actual emissions. Specifically, the factors for cast iron and unprotected steel are proposed to be reduced significantly, while the factors for protected steel would be increased, resulting in protected steel having a higher emissions factor than unprotected steel. This is not consistent with our working assumptions and would have significant impacts on

our understanding of our gas systems' emissions, as well as the reductions associated with pipe replacement projects, many of which have been encouraged by EPA's Natural Gas Star and Methane Challenge programs.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA's proposal to blend the direct flow measurements from the Lamb Study with the calculated leak frequency estimates from the Weller Study yields results that are significantly inconsistent with all other previous studies. It is well-known from previous studies and the extensive operational experience of the National Grid Companies that unprotected steel pipe has more leak emissions than modern cathodically protected steel pipe. Both the GRI-EPA 1996 Study[3] and the Lamb Study demonstrate this emissions differential. For this reason, EPA's voluntary Methane Challenge program includes commitments from natural gas distribution companies, including the National Grid Companies, to replace unprotected steel pipe with cathodically protected steel or plastic pipe to reduce emissions. EPA's Proposed Rule would undermine that objective because it would establish a higher default emission factor for protected steel than for unprotected steel mains (1.2 scf/hr/mi for unprotected steel mains vs. 2.3 scf/hr/mi for protected steel mains, see 87 Fed. Reg. 36981-82 (preamble) and proposed Table W–8, at page 37105). The Proposed Rule would also be contrary to the approach in the National Grid Companies' state regulated leak prone pipe replacement programs, including the Massachusetts Department of Public Utilities' (DPU) Gas System Enhancement Plans (GSEP) program[4] to replace unprotected steel mains.

EPA contends that the advantage of the Lamb Study was its methodology — using direct measurements with a high-volume sampler — while EPA contends that the Weller Study's advantage was its larger sample size. The Weller Study may have a larger sample size, but numerous limitations preclude it from being used as a basis for revisions to the default emission factors for distribution mains. The Weller Study leak rates are extremely variable and do not provide a reasonable basis for establishing national default emission factors. It also appears that the Weller Study did not utilize data from its full sample size in all cases.

Footnotes

[3] Methane Emissions from the Natural Gas Industry, Volume 9: Underground Pipelines, prepared for Gas Research Institute and USEPA, EPA-600 /R- 96-080i, June 1996 (the "GRI-EPA 1996 Study").

[4] https://www.mass.gov/lists/gseps-pursuant-to-2014-gas-leaks-act

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Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 20

Comment Excerpt: EPA has proposed to amend the subpart W emission factors for distribution mains using the measurements from Lamb et al. combined with the pipeline material specific leaks per mile data from Weller et al. We disagree with this approach, as it would not be internally consistent to combine the leak rate (scf/hr/leak) and the leak frequency (leaks/mile) from two different studies with vastly different methodologies and measurement methods. We have significant concerns with the Lamb et al. study, and therefore we recommend that EPA amend the subpart W emission factors for distribution mains using both the measurements and the pipeline material specific leaks per mile data from Weller et al.

In a January 2016 comment submitted as part of the GHG Inventory review process[71], we raised significant concerns with the methodology used in Lamb for estimating leak frequency. We summarize these comments as follows:

- This methodology is logically flawed: the algebra is not consistent with the approach operators take to surveying distribution systems for leaks. Furthermore, the underlying data for leak counts presented in Lamb et al. (2015) are not consistent with the definitions used by Lamb et al. It appears that some of the partner companies misinterpreted survey questions, so the underlying data is also flawed.
- Lamb et al. assume that operators surveying distribution systems find 85% of leaks, based on the same assumption in the 1990s GRI study. The GRI study attributed that assumption to information from a single partner company; no data or explanation is provided to substantiate the claim. Recent data presented by PG&E at a recent Gas Star meeting contradicts this assumption and shows that less than 85% of leaks are found using typical surveys.
- The leak per mile frequencies that EPA proposed in the December 2015 memo are inconsistent with the results from vehicle-based leak surveys that have been published in recent years. These surveys found significantly higher leaks in cities with significant amounts of outdated pipelines than the leak-per-mile frequencies EPA proposed would predict.

We further noted that top-down analyses have shown that emissions from natural gas distribution in two urban areas, Boston and Los Angeles, are considerably higher than EPA's 2015 GHG Inventory implied. The proposed changes to the Inventory will substantially reduce the estimate of emissions from Distribution, exacerbating the gap between what was measured in those cities and what the Inventory predicts.

Considering these internal flaws and inconsistencies with recent observations, we recommended against updating emissions factors for underground pipeline leaks based on Lamb et al. At the time, however, this was the only bottom-up study of underground distribution systems, and EPA chose to update the GHG Inventory based on the emission factors presented in Lamb et al.

However, the Weller et al. paper, published in 2020, did not contain the methodological issues we noted in Lamb et al., and it also has a much larger sample size of measured leaks. Despite EPA's note that the quantification used in Weller (AMLD) does not appear to be as accurate as the standard measurement method of modified high flow sampling utilized in the Lamb study, the authors of the Weller study were able to correct for the observed error. And, as they note, the larger sample size likely captures a wider (and more accurate) range of potential leak rates. Thus, both the leak rate and leak frequency from the Weller study are more reliable, and should be used to update the GHGRP emission factors.

Footnotes

[71] Clean Air Task Force, Comment on EPA's December 2015 Memorandum "Inventory of U.S. Greenhouse Gas Emissions and Sinks: Revisions under Consideration for Natural Gas Distribution Emissions" (Jan. 2016).

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 37

Comment Excerpt: EPA is proposing to change emission factors for gathering pipelines in Table W–1A based on the Lamb et al (2015) study of distribution pipelines. In particular, the protected steel emission factor is proposed to nearly double from 0.47 to 0.91 scf/hr/mile. For gathering pipelines, proposed emission factors are based on using the "Average Methane Leak Rate" from the Lamb Study in place of the GRI/EPA Study. We think EPA made two incorrect judgements when assessing the data. First, there is a significant increase in the mean leak rate due to only a few measured leaks. The three largest leaks measured in the Lamb Study (unprotected steel main, protected steel main, and cast iron main leaks) accounted for 50% of the total leak rate, whereas 90% of the measured leaks were less than approximately 3 scf/hr. The three largest leaks are by far outliers, and significantly increase the average emission rates for the respective material. As an example, removal of the large protected steel leak reduces the average leak rate and emission factor by ~60%.

Second, EPA only used leak data from distribution mains in the Lamb Study and excluded leak data from services, "[T]he emission factors for gathering pipelines by pipeline material are based on the leak rates for distribution mains by pipeline material." GPA does not support separating mains and services when identifying emission factors based on pipeline material. Gathering pipelines are not segregated like distribution pipelines and do not carry main or service designations. As such, it's not appropriate to represent gathering pipelines with only a portion of data collected on distribution pipelines from the Lamb Study. All leak measurement data for each pipeline material should be considered given the pipeline material is the corresponding factor when applying the results of the study on distribution pipelines to develop emission factors for gathering pipelines. Additionally, the Lamb Study notes, "it was not always possible to clearly define a main versus a service leak when the leak occurred at the junction between main

and service." The uncertainty distinguishing between pipeline mains and services provides more support to analyze the leak measurements from pipeline mains and services together. When data from mains and services are assessed together, the average leak rate for protected steel drops ~23%. Further, EPA should consider the Pipeline and Hazardous Materials Safety Administration's ("PHMSA") leak detection and monitoring requirements for gathering and boosting. There should be an opportunity to align data on leaks as an alternative to using an emission factor. This would also align with the directive in the Inflation Reduction Act to report emissions based on empirical data, where available.

Commenter Name: Curtis J. Winner
Commenter Affiliation: New Mexico Gas Company (NMGC)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0203-A1
Comment Excerpt Number: 3

Comment Excerpt: Use the Lamb Study Emission Factors for Mains and Services, Not the Weller study: Proposed revisions to the default population-based emission factors for estimating methane leak emissions from natural gas distribution mains protected and unprotected steel mains using the Weller study as justification are not credible, not supported by the record, and would undermine efforts to reduce actual emissions.

EPA's proposal to blend the direct flow measurements from the Lamb Study with the calculated leak frequency estimates from the Weller Study yields emission factors that are significantly inconsistent with all other previous studies and is contrary to the Methane Challenge program. It is well-known from previous studies and experience that unprotected steel pipe has more leak emissions than modern cathodically protected steel. Both the EPA-GRI 1996 study and Lamb Study demonstrated this emissions differential. Furthermore, EPA's voluntary Methane Challenge program incentivizes natural gas distribution companies or municipal utilities to replace unprotected steel pipe with cathodically protected steel pipe. EPA's Proposed Rule would undermine that incentive because it would establish a higher default emission factor for protected steel than for unprotected steel mains.

EPA has asked whether it should adopt the emission factors for gas distribution developed in the Lamb Study for reporting emissions with default emission factors under Subpart W. NMGC agrees with using the emission factors from the Lamb Study because EPA already uses the Lamb emission factors in its annual GHG Inventory, and because it is the best basis available at present for default national average emission factors. NMGC urges EPA to adopt the Lamb Study emission factors and leak frequency data -- which the agency has already adopted in the annual GHG Inventory -- as the new default population-based emission factors for gas distribution mains and services for Subpart W. This will promote consistency between Subpart W and the GHG Inventory and will improve the accuracy of reported emissions.

Commenter Name: Not provided
Commenter Affiliation: Exelon
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0209-A1
Comment Excerpt Number: 4

Comment Excerpt: Accurately reflect the relative emissions of pipe types - Updates to emissions factors for pipe mains and services should be done in a credible way that improves accuracy and builds upon known efforts to reduce emissions over time. The mixture of the Lamb and Weller studies results in proposed emissions factors that are inconsistent with common knowledge of emissions from various pipe types by suggesting that protected steel pipes have higher emissions rates than unprotected steel pipes. This brings into question all the factors developed through the combining of the two studies. Importantly, it would disincentivize emissions reduction actions that have been encouraged by EPA's Natural Gas Star program and Methane Challenge. The Lamb Study on its own reduces uncertainty through direct measurements, using a high volume sampler methodology, which is the appropriate approach for measuring flow rates from leaks and developing emission factors for specific types of pipe materials. The Lamb Study also includes nationwide data from 13 cities across the country in different climates and with a variety of distribution system configurations more representative of gas utilities nationwide, and it verifies leak locations. If emissions factors for pipe mains and services are to be updated, EPA should adopt the Lamb Study emission factors in the Subpart W Reporting Rule, as it did for the annual national GHG Inventory.

Commenter Name: Brian Jones
Commenter Affiliation: Downstream Natural Gas Initiative
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0249-A1
Comment Excerpt Number: 3

Comment Excerpt: The emissions reduction programs of many gas utilities involve replacement of leak prone pipe (*e.g.*, cast iron and unprotected steel) with modern materials (*e.g.*, protected steel and plastic). These programs have received approval for rate recovery from state regulators on the basis that they improve safety and reliability and reduce emissions. The proposed emission factors for mains would imply that the pipeline replacement programs approved by many states, and encouraged by EPA's Methane Challenge Program, are leading to increases in methane emissions. DSI encourages EPA to adopt distribution main emission factors that use the leak rates from the Lamb Study, which reflect the best available science. More broadly, DSI encourages EPA to align emissions factors for natural gas distribution mains and services across Subpart W and the annual Greenhouse Gas Inventory. This will lead to consistency across federal emissions reporting and facilitate alignment across different state and voluntary reporting programs.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 9

Comment Excerpt: To provide more accurate emissions reporting and to incentivize actual methane emission reductions, EPA should adopt the Lamb Study emission factors in the Subpart W Reporting Rule, as it did for the annual national GHG Inventory.

EPA has asked whether it should adopt the emission factors for gas distribution developed in the Lamb Study, which EPA already uses in the annual GHG Inventory, for reporting emissions with default emission factors under Subpart W. The Associations believe this is entirely appropriate because EPA already uses the Lamb Study emission factors in its annual GHG Inventory and because it is the best basis available at present for default national average emission factors.

First, the Lamb Study reduced uncertainty through direct measurements, using a high-volume sampler methodology, which is the appropriate approach for measuring flow rates from leaks and developing emission factors for specific types of pipe materials. The Lamb Study methodology involved delineating the parameters of a leak using standard leak detection technology, covering and sealing the leak area with a tarp, and connecting a high-volume sampler to measure the flow rate of the leak. This is a highly accurate method for measuring leak flow rates, as EPA has recognized by including it in a limited list of proposed direct emissions measurement methods.

Second, the Lamb Study included nationwide data from 13 cities across the country in different climates and with a variety of distribution system configurations more representative of gas utilities nationwide. The distribution systems studied were geographically diverse and included dense urban areas as well as suburban and rural areas. The Lamb Study database of 13 cities is clearly more representative than the Weller Study that only included four cities.

Third, the Lamb Study methodology Verified leak locations. Unlike the Weller Study, the Lamb Study verified leak locations before measurement by using standard, reliable leak detection methods to identify the exact area of a leak. This further helped reduce uncertainties.

Fifth, the Lamb Study research team verified pipe material and distinguished between cathodically protected and cathodically unprotected steel pipe. Because operators assisted the authors of the Lamb Study in allowing site access, providing pipe asset and operations information, and following up on leak measurements by excavating the leak locations and conducting repairs, the authors were able to view the pipe, verify the pipe material and the presence or absence of cathodic protection, and report back to the research team. This prevented confusion between cathodically protected and unprotected steel pipe that is a weakness of the Weller Study.

For the foregoing reasons, The Associations urge EPA to adopt the Lamb Study emission factors and leak frequency data — which the agency has already adopted in the annual GHG Inventory — as the new default population-based emission factors for gas distribution mains and services for Subpart W. This will promote consistency between Subpart W and the GHG Inventory and will improve the accuracy of reported emissions.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 3

Comment Excerpt: EPA's Proposed Revisions to the Default Population-Based Emission Factors for Estimating Methane Leak Emissions from Natural Gas Distribution Protected and Unprotected Steel Mains Are Not Supported by the Record, Not Supported by the National Grid Companies' Data and Experience, and Would Undermine Efforts to Reduce Actual Emissions.

EPA should use the Lamb Study[1] for both leak rate and leak incidence (leaks per mile) to determine emission factors for mains, not the Weller Study[2] for leak incidence (leaks per mile). Proposed revisions to the default population-based emission factors (*i.e.*, Emission Factor (scf/hr/mile) = Average Leak Rate (scf/hr/leak) x Equivalent Leaks per Mile) for estimating methane leak emissions from natural gas distribution protected and unprotected steel mains are not credible, not supported by the record, and would undermine efforts to reduce actual emissions through state supported leak prone pipe replacement programs. The National Grid Companies have substantial data to support their position on leak incident data per mile of pipe for the various pipe materials they have historically used.

Footnotes

[1] Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States, Environmental Science & Technology (acs.org), Lamb et al., Environ. Sci. Technol. 2015, 49, 8, 5161-5169 (the "Lamb Study").

[2] A National Estimate of Methane Leakage from Pipeline Mains in Natural Gas Local Distribution Systems, Environmental Science & Technology (acs.org), Weller et al., Environ. Sci. Technol. 2020, 54, 14, 8958-8967 (the "Weller Study").

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 10

Comment Excerpt: EPA has asked whether it should adopt the emission factors for gas distribution developed in the Lamb Study for reporting emissions with default emission factors under Subpart W. The National Grid Companies support the adoption of the Lamb Study to determine emission factors because it is the best basis available at the present time for default national average emission factors.

First, the Lamb Study reduced uncertainty through direct measurements, using a high-volume sampler methodology, which is the appropriate approach for measuring flow rates from leaks and developing emission factors for specific types of pipe materials. The Lamb Study methodology involved delineating the parameters of a leak using standard leak detection technology, covering and sealing the leak area with a tarp, and connecting a high-volume sampler to measure the flow rate of the leak. This is a highly accurate method for measuring leak flow rates, as EPA has recognized by including it in a limited list of proposed direct emissions measurement methods.

Second, the Lamb Study included nationwide data from 13 cities across the country in different climates and with a variety of distribution system configurations more representative of gas utilities nationwide. The distribution systems studied were geographically diverse and included dense urban areas as well as suburban and rural areas. The Lamb Study data base of 13 cities is clearly more representative than the Weller Study that included only four cities.

Third, the Lamb Study methodology verified leak locations. Unlike the Weller Study, the Lamb Study verified leak locations before measurement by using standard, reliable leak detection methods to identify the exact area of a leak. This further helped reduce uncertainties.

Fourth, the Lamb Study research team verified pipe material and distinguished between cathodically protected and cathodically unprotected steel pipe. Because operators assisted the Lamb Study authors by providing site access, providing pipe asset and operations information, and following up on leak measurements by excavating the leak locations and conducting repairs, the authors were able to view the pipe, verify the pipe material and the presence or absence of cathodic protection, and report back to the research team. This prevented confusion between cathodically protected and cathodically unprotected steel pipe that is a weakness of the Weller Study.

For the foregoing reasons, the National Grid Companies urge EPA to adopt the Lamb Study emission factors as the new default population-based emission factors for gas distribution mains for Subpart W.

Commenter Name: Brian Jones
Commenter Affiliation: Downstream Natural Gas Initiative
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0249-A1
Comment Excerpt Number: 1

Comment Excerpt: DSI supports revising the distribution main and service emission factors to use the leak rates derived from the Lamb et al.[3] study (Lamb Study). The Lamb Study leak rates reflect the most up to date data on emissions from natural gas distribution pipelines.

Footnotes

[3] Lamb et al. "Direct measurements Show Decreasing Methane Emissions from natural Gas Distribution Systems in the United States." Environmental Science & Technology. 13 Apr 2015. https://pubs.acs.org/doi/pdf/10.1021/es505116p

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Commenter Name: Not provided
Commenter Affiliation: GTI Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0198-A1
Comment Excerpt Number: 1

Comment Excerpt: Data from sources outside of Weller et al[1] does not support changing the protected steel main emission factor to a value greater than that for unprotected steel mains for natural gas distribution systems. EPA is proposing to update the leak rate portion of the emission factors for distribution mains using measurements from Lamb et al.[2] combined with pipeline material leaks per mile data from Weller et al. Table W–8 to subpart W of part 98 in the document shows the proposed emission factor for protected steel pipeline (2.3 scf/hour/component) is almost twice the emission factor for unprotected steel pipeline (1.2 scf/hour/component) for distribution mains. This emission factor change is not supported by data. From 2014 to 2016 GTI Energy performed a data analysis effort in partnership with six distribution companies to develop improved activity factors for natural gas distribution pipelines. The surveyed companies covered a nearly 10% of the U.S. natural gas distribution system in terms of miles of mains. The focus of the study was to use company information on tracked and graded leaks across the distribution companies to re-examine the total equivalent leaks equation that was developed in the 1996 GRI/EPA study[3]. The extensive data collected from the companies to perform this evaluation revealed important information on the numbers of leaks per mile of mains separated by pipe material. Most importantly, numbers of leaks per mile when ranked by material type was found to be Plastic < Protected/coated steel < Unprotected/ uncoated steel < cast iron/ wrought iron. A breakdown of the findings is shown in the table below from the original report.

[See DCN EPA-HQ-OAR-2019-0424-0198-A1 for Table 5. Equivalent Leak Frequency for Natural Gas Distribution Pipelines]

We acknowledge that the information was reported in 2016, and thus is somewhat dated, but it does point to a key conclusion, that based on our data and the Lamb et al. 2015 data, protected steel mains tend to leak less frequently than unprotected steel mains. The shared OTD study is consistent with Lamb et al., 2015[4] which also followed the same trend for this metric. The EPA proposed changes are based on the Weller et al 2020 findings, which found that protected and unprotected steel had 0.61 and 0.51 leaks per mile. However, one key limitation with the study is

a lack of verification of the actual leaking pipe material due to the use of a mobile, vehicle-based system to quantify emissions/leaks. This type of measurement has many advantages and is quite useful, but it makes attribution of individual emissions/leaks to a particular material type difficult. There are useful findings in Weller et al. 2020, but unfortunately this is one limitation that makes incorporation of the findings for individual pipe material problematic. Therefore, GTI suggests that more targeted research be funded and conducted on emissions across the pipe materials across the U.S. before any significant changes are made. One way to highlight this need is to examine the uncertainty range for protected and unprotected steel leaks per mile in Weller et al. 2020 as shown in Figure 1. This shows that using just the expected value (*i.e.*, Mean or average) to estimate a single emission rate for each material is misleading. Statistically, it is somewhat inaccurate to say that unprotected steel pipes will always have lower leak frequencies than protected steel pipes based on this data. This wide range of values being incorporated for the calculation of activity factors and emission factors is not uncommon and can only be reduced with broader study and categorization of data (*e.g.*, by state or region).

[See DCN EPA-HQ-OAR-2019-0424-0198-A1 for Figure 1. Leaks per mile from Table 2 in Weller et al. 2020.]

Footnotes

[1] Weller, Z.D; Hamburg, S.P.; and Von Fischer, J.C. 2020. "A National Estimate of Methane Leakage from Pipeline Mains in Natural Gas Local Distribution Systems." Environ. Sci. Technol. 2020, 54(1), 8958.

[2] Lamb, B.K. et al. "Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States." Environ. Sci. Technol. 2015, 49, 5161-5169.

[3] Campbell, L.M., M.V. Campbell, and D.L. Epperson. Methane Emissions from the Natural Gas Industry. Volume 9: Underground Pipelines. Prepared by Radian International LLC for the Gas Research Institute (GRI) and U.S. Environmental Protection Agency (EPA). Chicago, IL, 1996.

[4] Lamb, B.K.; Edburg, S.L.; Ferrara, T.W.; Howard, T.; Harrison, M.R.; Kolb, C.E.; Townsend-Small, A; Dyck, W; Possolo, A.; Whetstone, J.R. "Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States." Environmental Science & Technology, 2015, 49 (8), 5161-5169; DOI: 10.1021/es505116p.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 16

Comment Excerpt: Under the current rule, EPA directs gas utilities to use the emission factor developed in their survey of above-ground Transmission-Distribution Stations (T-Ds) multiplied by the count of other above-ground metering and regulating equipment to estimate methane emissions from above-ground metering and regulating stations (M&Rs). However, the current rule requires using default national average, population based emission factors to estimate

emissions from below grade T-Ds and other M&Rs that are below grade, with several different emission factors depending on the inlet pressure of the station.

The Proposed Rule would somewhat streamline emission reporting for these below grade sources by using a single emission factor without correlating it to inlet pressure. The agency reasons that the Lamb Study did not find significant differences in emissions between below-grade T-Ds or M&Rs with different inlet pressures. The National Grid Companies support this reasonable reform but does not think it goes far enough to improve reporting of emissions from below grade sources. The National Grid Companies conduct regular safety-related leak surveys of their above and below grade M&Rs and above and below grade T-Ds, as well as other above and below grade M&Rs. This data can be used to demonstrate how a company's leak rate at other M&Rs compared to the company's T-Ds. The National Grid Companies are finding that the leak rates are very low for both categories of station and they should be allowed to use the company-specific Subpart W survey T-D emission factor for these M&Rs, regardless of whether the stations are above or below grade.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 16

Comment Excerpt: Under the current rule, EPA directs gas utilities to use the emission factor developed in their survey of above-ground T-Ds multiplied by the count of other above-ground metering and regulating equipment to estimate methane emissions from above-ground M&Rs. However, the current rule requires using default national average, population-based emission factors to estimate emissions from below grade T-Ds and other M&Rs that are below grade, with several different emission factors depending on the inlet pressure of the station.

The Proposed Rule would somewhat streamline emission reporting for these below grade sources by using a single emission factor without correlating it to inlet pressure. The agency reasons that the Lamb Study did not find significant differences in emissions between below grade T-Ds or M&Rs with different inlet pressures. The Associations support this reasonable reform but do not think it goes far enough to improve reporting of emissions from below grade sources.

While direct measurement and AMLD campaigns may be feasible for larger utilities, this may be beyond the means of smaller gas utilities, especially those that are operated by small municipalities. Therefore, the Associations request that as an alternative to the proposed combined default national average emission factor for below grade sources or the direct measurement solution discussed above, EPA should allow a gas distribution utility to use its T-D emission factor for both above and below grade T-Ds and M&Rs. In addition, where a utility follows up a leak detection with repair, the utility should not be required to apply an emission factor that assumes the leak continues for the entire year or until the next T-D Subpart W survey.

Instead, the date of documented leak repair should be used as the end point for the leak. Our members are finding that the leak rates are very low for both categories of station. They should be allowed to use their company/utility-specific Subpart W survey T-D emission factor for these M&Rs, regardless of whether they stations are above or below grade.

Commenter Name: Not provided
Commenter Affiliation: Exelon
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0209-A1
Comment Excerpt Number: 5

Comment Excerpt: Provide consistency in emissions factors to incentivize voluntary emissions reduction programs- Any change in emissions factors should be considered in light of its indirect impact on voluntary emissions reductions programs, which are currently the backbone of U.S. GHG emissions reduction efforts. Preamble context around the intent of each change should acknowledge the importance of the proposed methodology to many voluntary reduction programs and the intent that new factors can be incorporated into GHG emissions tracking and reduction programs without disruption to efforts already taken. The original 1996 GRI-EPA Study used high volume samplers to measure leak flow rates from gas distribution mains and provided a higher emissions rate calculation than was found in the Lamb Study. The lower emissions rate in the Lamb study is likely due to the increased application of best practices for leak detection and repair learned through industry best practices workshops and EPA's voluntary Gas STAR and Methane Challenge programs over time. Accordingly, if the emissions factors are updated to the Lamb study factors, EPA should clarify that these are to be applied to current and future emissions reporting but do not require adjustment to previously reported emissions through the Subpart W program or other voluntary emissions reduction initiatives (such as EPA Natural Gas STAR, EPA Methane Challenge, or individual private sector GHG reduction goal programs) that were based on the original GRI-EPA Study emission factors. This would better represent the improvement to system operations over time.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 13

Comment Excerpt: The Associations request that EPA adopt a practice used in its GHG Inventory to interpret emissions data across the time series of reported data. Namely, when EPA adopts new estimates in the GHG Inventory based on new emissions studies of specific sources,

the agency determines whether it is appropriate to apply the new emissions estimate back to 1990 or, instead, to use previous emission factors for earlier years and the new emissions data for later years. This practice recognizes that lower emissions estimates are likely due to improving leak detection and repair standards as well as adoption of other emission reduction best practices. EPA's proposed emission factor for cast iron pipe is a case in point. The 1996 GRI-EPA Study used high volume samplers to measure leak flow rates from gas distribution mains and provided a higher emissions rate calculation than was found in the Lamb Study. The lower emissions rate is likely due to the increased application of best practices for leak detection and repair standards that the Associations members have learned through industry best practices workshops and EPA's voluntary Natural Gas STAR and Methane Challenge programs. Accordingly, the more recent Lamb Study emission factors could be appropriately applied to estimate current day emissions and would not require a readjustment to previously reported emissions through the Subpart W program or other voluntary emissions reduction initiatives (such as EPA Natural Gas STAR, EPA Methane Challenge, or individual private sector GHG reduction goal programs) that were based on the original 1996 GRIEPA Study emission factors.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 14

Comment Excerpt: For Subpart W Reported Data Filed in Previous Years for Distribution Mains and Services, EPA Should Retain the Emission Factors Used in Those Prior Reports to Better Reflect Improving Leak Detection and Repair Practices Over Time.

The National Grid Companies request that EPA adopt a practice used in its GHG Inventory to interpret emissions data across the time series of reported data. Namely, when EPA adopts new estimates in the GHG Inventory based on new emissions studies of specific sources, the agency determines whether it is appropriate to apply the new emissions estimate back to 1990, or instead to use previous emission factors for earlier years and the new emissions data for later years. This practice recognizes that lower emissions estimates are likely due to improving leak detections and repair standards, as well as adoption of other emission reduction best practices. In other words, there are two components to the emission factor: one is the flow rate at the leak source and the other is the emission rate calculation, taking into consideration the time between detection and repair of the leak.

EPA's proposed emission factor for cast iron pipe is a case in point. The GRIEPA 1996 Study used high-volume samplers to measure leak flow rates from gas distribution mains and provided a higher emissions rate calculation than was found in the Lamb Study. The lower emissions rate in the more recent Lamb Study is likely due to the increased application of best practices for leak detection and repair standards that companies have learned through industry best practices workshops and EPA's voluntary Natural Gas STAR and Methane Challenge programs. Accordingly, the more recent Lamb Study emission factors could be appropriately applied to

estimate current day emissions and would not require a readjustment to previously reported emissions through the Subpart W program or other voluntary emissions reduction initiatives (such as EPA Natural Gas STAR, EPA Methane Challenge, or individual private sector GHG reduction goal programs) that were based on the original GRI-EPA 1996 Study emission factors.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 13

Comment Excerpt: EPA should align emission factors (EFs) between its GHG Reporting Programs. Currently EPA's mandatory GHGRP and the Inventory of U.S. Greenhouse Gas Emissions and Sinks (GHGI) use different emissions factors for some of the same sources, including the distribution mains and services and metering and regulating stations. EPA's proposed rule would align some of the GHGRP emission factors, which is helpful; however, EPA is also proposing the use of completely different sets of emission factors that do not align with either of its current GHG programs. For example, EPA has proposed to use revised emission factors in Subpart W for different types and materials of distribution pipes based on a study that did not verify the types and materials of the pipe, among other shortcomings. EPA should instead use the emission factors already used for the GHG Inventory, which are based on a study that did verify pipe type and material and provided a more reliable assessment of emissions from distribution mains and services. Having multiple emission factors for the same source, under similar programs, creates confusion and adds additional burdens on reporters. Moreover, the proposed changes would indicate that unprotected steel mains have lower emissions rates than modernized protected steel mains. Any such claim would be inaccurate. Indeed, modernized protected steel mains have lower associated emissions rates and are currently being installed by regulated utilities who are seeking approval for, or are implementing, pipeline replacement projects/programs which are aimed at replacing aged infrastructure such as cast iron and unprotected steel pipelines.

Commenter Name: Not provided
Commenter Affiliation: Exelon
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0209-A1
Comment Excerpt Number: 6

Comment Excerpt: Align best practice adjustments with reporting - Increased alignment with other EPA methane reduction programs would allow emissions benefits to be acknowledged in reporting. In addition to recognizing the new factors as applicable to contemporary reporting, it

would be helpful to identify specifically what Natural Gas Star initiatives are considered above and beyond what is assumed in the new factors, such that avoided emissions as reported to Natural Gas Star could be incorporated as adjustments to the emissions that result from the emissions factors. For example, new technologies employed for methane capture during typical operations include pipeline pump-down techniques to lower gas line pressure. To drive alignment of programs and emissions reporting, it would be prudent to acknowledge and allow for these additional best practice adjustments to be directly incorporated into reporting.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 6

Comment Excerpt: Duke Energy also notes that the proposed revised text heading for Table W–7 is incorrect. It appears that EPA intended to state that Table W–7 applies to "Default Methane Leaker Emission Factors for Natural Gas Distribution" rather than "Default Hydrocarbon Leaker Factors for Onshore Natural Gas Processing."[6] The regulatory text at the proposed 40 C.F.R. § 98.236(x) makes it clear that Table W–7 is applicable to T-D transfer station components, and the internal column headers in the proposed revision to Table W-7 also provide that this applies to T-D transfer station components. As noted above, however, Duke Energy's position is that the leak factors in Table W–7 of the current Subpart W should not be revised.

Footnotes

[6] 87 Fed. Reg. at 37,105.

Commenter Name: Ryan Streams
Commenter Affiliation: Kairos Aerospace (Kairos)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0176-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA's decision to allow calculation-based methods in lieu of measurement will lead to continued inaccuracies within the inventory.

We're encouraged by EPA's decision to include a pathway for methane monitoring under the proposed NSPS OOOOb and EG OOOOc rules to be used for reporting purposes. We believe that approach requires some modification to be less reliant on OGI data, but it is a promising step in the right direction. We are, however, deeply concerned because by EPA's own

acknowledgment, "In reviewing subpart W data, we find that the vast majority (greater than 95 percent) of onshore production and natural gas gathering and boosting facilities use Component Count Method 1 to estimate the count of components."

That means in large part, all of EPA's efforts to incorporate measurement data into the GHGRP will likely go unused, as companies still have the option to make a much simpler calculation using component counts. If EPA leaves this approach in, it will undoubtedly undermine the quality and accuracy of the data reported. The scientific evidence clearly demonstrates that the component count approach to calculating emissions does not handle the contribution of super emitters effectively, and EPA's data will continue to be hamstrung as a result. We encourage EPA to reconsider an approach to emission calculations that's devoid of real world measurement when we clearly understand that very same measurement is the only way to really understand emissions.

Commenter Name: Curtis J. Winner
Commenter Affiliation: New Mexico Gas Company (NMGC)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0203-A1
Comment Excerpt Number: 4

Comment Excerpt: NMGC is pleased that the agency is proposing an option for reporting to conduct direct measurements of leaks using technology such as a high-volume sampler or calibrated bag methodology to allow reporting more accurate emissions data under Subpart W. Direct measurements of leaks on gas distribution sources (mains, services, and equipment leaks at T-D stations) using high volume samplers can provide a more accurate assessment of a company's actual emissions from specific sources than population-based default emission factors. In fact, population-based emission factors (multiplied by miles of pipe or numbers of components or equipment) do not allow a company to demonstrate its actual emission reductions using improved monitoring, leak detection and repair. This inability to demonstrate reductions despite significant cost and effort could undermine what otherwise would be an incentive to achieve greater reductions. Additionally, if NMGC expands its natural gas system to serve more customers or improve reliability, the additional miles of pipe or number of pressure regulating stations results in reporting apparent increased emissions of methane — even if actual emissions declined due to the use of best practices and improved materials. In contrast, a leaker-based, company-specific emission factor that is multiplied by the number of detected leaks provides a more accurate emissions assessment and creates an incentive to reduce leaks in the system.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 12

Comment Excerpt: These proposed amendments include new population EFs that are on a per major equipment basis rather than a per component basis. By providing emission factors on a major equipment basis instead of by component, EPA would eliminate the step to estimate the number of components. However, EFs were based on studies of emission sources and other operational parameters that may not be reflective of a reporter's actual emissions.

The Alliance supports EPA's proposal. However, we request EPA allow reporters the option to conduct engineering studies to determine the best emission data for that source that account for design and operational differences or allow the collection of actual emissions.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 15

Comment Excerpt: Direct measurements of leaks on gas distribution sources using high volume samplers can provide a more accurate assessment of a company's actual emissions from specific sources than population-based default emission factors. In fact, population-based emission factors (multiplied by miles of pipe or numbers of components or equipment) do not allow a company to demonstrate its actual emission reductions using improved monitoring, leak detection and repair. This inability to demonstrate reductions despite significant cost and effort could undermine what otherwise would be an incentive to achieve greater reductions. Additionally, if a natural gas utility expands its natural gas system to serve more customers or improve reliability, the additional miles of pipe or number of pressure-regulating stations will result in reporting apparent increased emissions of methane — even if actual emissions declined due to the use of best practices and improved materials. In contrast, a leaker-based, utility-specific emission factor that is multiplied by the number of detected leaks provides a more accurate emissions assessment and creates an incentive to reduce leaks in the system. A robust leak detection program can provide assurance of finding any significant "unknown "leaks not already on a utility's leak log.

EPA is aware of this dilemma, and at least one major environmental organization has publicly expressed support for using direct measurements and technology advancements to improve the detection, quantification, and characterization of methane emissions.[28] In this rulemaking, EPA has an opportunity to promote the use of direct measurement to improve the accuracy of emissions reporting while incentivizing and rewarding emission reductions.

Footnotes

[28] See, *e.g.*, Testimony of David Lyon, PhD, Senior Scientist, Environmental Defense Fund (EDF), before the House Committee on Science, Space, and Technology (June 8, 2022), Lyon Testimony.pdf (house.gov), p. 4.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 15

Comment Excerpt: Direct measurements of leaks provide a more accurate assessment of a company's actual emissions than population-based default emission factors. In fact, population-based emission factors that are multiplied by miles of pipe or numbers of components or equipment do not allow a company to demonstrate its actual emission reductions through the use of improved monitoring, leak detection, and repair. This inability to demonstrate reductions despite significant cost and effort could undermine what otherwise would be an incentive for working to achieve greater reductions. Additionally, if a natural gas utility expands its natural gas system to serve more customers or improve reliability, the additional miles of pipe or number of pressure regulating stations will result in reporting apparent increased emissions of methane — even if actual emissions in the real world declined due to the use of best practices and improved materials. EPA is aware of this dilemma, and at least one major environmental organization has publicly expressed support for using direct measurements and technology advancements to improve the detection, quantification, and characterization of methane emissions.[16] In this rulemaking, EPA has an opportunity to promote the use of direct measurement to improve the accuracy of emissions reporting while incentivizing and rewarding emission reductions.

Footnotes

[16] See, *e.g.*, Testimony of David Lyon, PhD, Senior Scientist, Environmental Defense Fund (EDF), before the House Committee on Science, Space, and Technology (June 8, 2022), Lyon Testimony.pdf (house.gov), p. 4.

Commenter Name: Brian Jones
Commenter Affiliation: Downstream Natural Gas Initiative
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0249-A1
Comment Excerpt Number: 5

Comment Excerpt: The population emission factor approach based on main mileage and service counts assumes that all pipelines of a given material are leaking at all times, regardless of age. This approach does not allow LDCs to show progress reducing actual emissions through strategies such as eliminating grade 3 leak backlogs. An approach that combines company-specific emission factors and the number of system leaks would allow for more accurate quantification of actual emissions than is currently possible using EPA's default population-based emission factors and enable companies that are investing in more frequent and advanced methods (AMLD) to find and eliminate leaks to demonstrate progress in reducing emissions.

A-15. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for other large release events

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 10

Comment Excerpt: Other Large Release Events

Large release events, such as well blowouts, are not currently reported under Subpart W. Through the proposed revisions to Subpart W, EPA is looking to add a category to report such events on the basis that those events can result in environmentally significant quantities of emissions. As these large releases are very infrequent, PBPA questions the need for a new category to report them. Although an individual release may result in relatively high emissions in a given year, the infrequency of the events suggests that for almost all producers in any given year the emissions from this category would be zero. The proposal itself estimates that blowouts of all sizes, from the smallest to the largest categories, only occur once between every 840 and 2,000 wells drilled. PBPA would recommend more work be done to determine the scale of these emissions to justify their inclusion in Subpart W reporting, as this would add to the effort and recordkeeping required to comply with the rule. We would also recommend more information be provided for the purposes of calculation to streamline reporting and to help producers who would need to report in the category in any given year to report the information accurately.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 44

Comment Excerpt: For "other large release events," EPA proposes to collect data elements that are extraneous to the information EPA needs to assess and compile GHG emissions. This

information includes proposed reporting of the start and duration of an event, a description of the event, and volume fractions of emissions, among other things.

Such reporting is not likely to provide information of regulatory value or to inform the development or implementation of any EPA regulatory program. The significant additional burden that these requirements will impose are, therefore, not justified, and they should be removed from the rule.

Additionally, it is important to emphasize that these types of emissions are likely complicated to assess, and providing EPA with additional "raw" data is unlikely to allow the Agency to effectively validate reporting of emissions from these sorts of abnormal emission events. Regarding EPA's proposal to request reporting on "whether the release was identified under the provisions of part 60, subpart OOOOb of this chapter or an applicable approved state plan or applicable Federal plan in part 62 of this chapter," the rule should expressly recognize that "NA" must be an option because some events will be caused by sources not subject to those rules.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 9

Comment Excerpt: The addition of a reporting requirement for "Other Large Release Events" should be clarified and the reporting threshold should be increased. EPA is proposing an additional calculation and reporting requirement to Subpart W to capture "Other Large Release Events."[13]

EPA's proposed new reporting category is not sufficiently defined and does not provide enough details on applicability and methodologies. Consequently, the rule, as proposed, is likely to require substantial work by facilities to capture information on infrequent events that result in relatively minor releases to assure compliance with the regulation. Measures that would be required to identify and quantify such infrequent and relatively small events are not practical. EPA may have intended to exclude consideration of relatively small releases from normal operations, for example by stating that the reporting applies to "unplanned, unexpected, and uncontrolled" releases; however, those terms are subject to interpretation. Accordingly, EPA should provide additional clarification in any final rule requiring the reporting of "other large release events."

Footnotes

[13] 87 Fed. Reg. at 36,982; 40 C.F.R. §§ 98.233(y), 98.236 (y).

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 8

Comment Excerpt: The MSC is concerned that the definition of "other large release event" is overly broad. For example, the definition includes a single equipment leak or release which has emissions exceeding the emissions calculated for that source using applicable methods in § 98.233 by the threshold in § 98.233(y). This would imply that each leaking component found during a survey would need to be evaluated against this threshold. In addition to the difficulties in estimating an emissions rate from a single leaking component, there is no provision to evaluate the duration of the leak (and any repairs to mitigate it). Additionally, the definition includes the provision that there are no calculation methodologies available for estimating the source emissions. However, there are already specific methods for calculating emissions from equipment leaks. The MSC believes that these methods should be used as appropriate.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 11

Comment Excerpt: A temporal limit should be added to the definition of "other large release events." EPA is proposing to add "other large release events" as a new reporting source category to account for abnormal emission events that are not currently captured by existing Subpart W reporting methods.[6] The current proposal would require calculation and reporting of greenhouse gas emissions from events that release at least 250 mt CO_2e "per event."[7] We believe that a "per event" standard would be unnecessarily vague and that a better approach would be to use objective standards in this context, similar to release reporting thresholds in other regulations. Specifically, the rules should provide that a "large release event" has occurred when there has been a release of 250 mt CO_2e or more in any one 24-hour period. This would clarify that a relatively small leak occurring over a long period of time is not deemed to be a "large release event" for purposes of the rule, which would be in keeping with the clear intent of the proposal to limit the new "other large release events" category to unique events resulting in very large emissions over a relatively short period of time, *e.g.*, the Ohio well blowout referenced in the preamble,[8] rather than small leaks which as EPA notes "are ubiquitous across the oil and gas sector ... and have been studied and characterized."[9] It would also have the benefit of providing a clear and objective standard, which would align with other rule provisions that base reporting thresholds on 24-hour interval periods.

Footnotes

[6] 87 Fed. Reg. 36982 (June 21, 2022)

[7] Id.

[8] Id.

[9] Id.

Commenter Name: Douglas Jordan
Commenter Affiliation: Western Midstream Partners, LP
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0202-A1
Comment Excerpt Number: 8

Comment Excerpt: Some of the proposed rule elements that we oppose include the following items which are further detailed in the comments WES has endorsed (American Petroleum Institute, Gas Processors Midstream Association, and Texas Pipeline Association): Requiring the reporting of "large release" events without an event timeframe (we recommend applying a "within 24 hours" timeframe to each event).

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 13

Comment Excerpt: EPA states in the preamble that the proposed definition specifies that pressure relief valve releases from onshore production and onshore petroleum and natural gas gathering and boosting storage tanks would not be considered other large release events because the calculation methodology for these storage tanks currently assumes all flash gas will be emitted. These proposed additional calculation and reporting requirements would apply to all subpart W industry segments. The new calculation requirements being proposed rely on measurement data or engineering estimates of the amount of gas released and measurement data, if available, or process knowledge (best available data) to estimate the composition of the released gas. The proposed requirement to calculate and report GHG emissions from other large release events would be limited to events that release at least 250 $mtCO_2e$ per event. This is equivalent to approximately 500,000 scf of pipeline quality natural gas.

The definitions of other large release events, well blowouts, and well releases are confusing as to what events are reportable, and require additional specificity, *e.g.*, it is unclear what short and long duration mean in these definitions. Additionally, it is unclear when emission calculations are to begin. We recommend EPA establish a 24-hour threshold whereby if an event exceeds that

period, a reporter, at that time, would begin to determine if the event exceeds the 250 $mtCO_2e$ release. Calculations for events occurring less than 24 hours would not be conducted or reported.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 39

Comment Excerpt: We support EPA's proposal to include a new category of reported emissions from large release events (250 $mtCO_2e$ per event (10 $mtCH_4$) or approximately 500,000 scf of pipeline quality natural gas), but we urge EPA to set a lower threshold that captures more of these events. If EPA does not lower the threshold, we encourage EPA to account for emissions from large events missed by the proposed threshold and methodology through other aspects of the reporting program, such as through statistical incorporation into the leaker emission factors. Adoption of our proposed subpart W updates to comply with the MERP directive (described above) would also cure this problem.

The emission events that would be captured by EPA's proposed threshold are only the most catastrophic, sometimes releasing more greenhouse gas emissions than entire European countries—like the XTO well blowout in Ohio (60,000 tons of methane at a rate of 100 million scf per day)[104] and the Aliso Canyon leak (109,000 tons of methane).[105] While it is critical that such catastrophic events are reported, abnormal process conditions and equipment failures commonly lead to large emissions that fall below this threshold. These types of events, many of which will fall below EPA's proposed threshold, significantly contribute to the source category's total emissions—by our estimate, representing 63% of the total in the production segment alone.[106] The existing reporting requirements do not account for super-emitters and abnormal process emissions at all, which is the primary cause of the difference between our estimates and EPA's. For reporting to be accurate and serve as the basis for accurate emissions estimates, such events must be addressed through the reporting estimation methodologies.

EPA should lower the reporting threshold for this category to encompass all leaks with a detected emission rate greater than 10 kg/hr CH_4 discovered through a fugitive monitoring survey. An emission rate of this magnitude would exceed EPA's proposed large release event threshold of 10 $mtCH_4$ if it lasted for approximately 42 days. Under existing and proposed EPA regulatory standards, fugitive monitoring occurs at most bi-monthly (six times per year), so it is entirely possible that leaks of 10 kg/hr or greater would go undetected for this length of time and exceed the threshold already proposed by EPA. However, under the existing threshold, these events would often go unaccounted for because operators could simply assume a detected large emission event had not been emitting for very long and choose to not report it as a large release event. Requiring leaks with detected emission rates greater than 10 kg/hr CH_4 to be reported will help to ensure that reported emissions reflect what is observed in the field, and can inform the

development of EPA's estimates, helping to reduce the large discrepancy with the majority of other independent scientific estimates.

Operators that discover these events will usually have done so as part of a fugitive monitoring survey or due to a notification from a third-party. They are therefore likely to investigate the source and fix the underlying problem, whether voluntarily or for regulatory compliance. Operators that do so should be able to subtract from their reported emissions the emission-factor or engineering calculation estimate associated with the equipment or component that caused the large leak, for the period in which the leak is estimated to have occurred (the duration of leak should be estimated either through use of operational data, or where none is available, the leak should be assumed to have existed since the last LDAR survey). This will ensure emissions are not double counted. For example, in the case of a large emission event attributed to an unlit associated gas flare, an operator could exclude reporting the event if they adjusted the associated gas flaring and venting data to account for the event's anomalous venting.

Footnotes

[104] Carlos Anchondo, Exxon Well Blowout Caused 'Extreme' Methane Leak — Study, E&E News (Dec. 17, 2019), https://www.eenews.net/articles/exxon-well-blowout-caused-extreme-methane-leak-study/; Sudhanshu et al., Satellite Observations Reveal Extreme Methane Leakage from a Natural Gas Well Blowout, 116 PNAS 26,376-81 (Dec. 16, 2019), https://www.pnas.org/doi/10.1073/pnas.1908712116.

[105] California Air Resources Board, Aliso Canyon Natural Gas Leak, https://ww2.arb.ca.gov/ourwork/programs/aliso-canyon-natural-gasleak#:~:text=A%20complete%20calculation%200f%20the,109%2C000%20metric%20tonnes%200f%20methane.

[106] See Figure 2 above.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 10

Comment Excerpt: We support EPA's proposal to include a new emissions source for large release events of at least 250 mtCO_2e per event or approximately 500,000 scf of pipeline quality natural gas, but we urge EPA to set a lower threshold that captures a greater number of such events. If EPA does not lower the threshold to account for such events, it must account for those emissions through other aspects of the reporting program, such as through statistical incorporation in the leaker emission factors.

The emission events that would be captured by EPA's proposed threshold are only the most catastrophic, sometimes releasing more greenhouse gas emissions than entire European countries–like the XTO well blowout in Ohio (60,000 tons of methane at a rate of 100 million scf per day)[41] and the Aliso Canyon leak (109,000 tons of methane).[42] While it is critical that such

catastrophic events are reported, abnormal process conditions and equipment failures commonly lead to large emissions that fall below this threshold. These types of events significantly contribute to the source category's total emissions–by our estimate, representing 63% of the total in the production segment alone.[43] The existing reporting requirements do not account for super emitters and abnormal process emissions at all, which is the primary cause of the difference between our inventory estimates and EPA's. For reporting to be accurate and serve as the basis for accurate inventory estimates, such events must be addressed through the reporting estimation methodologies.

EPA should lower the reporting threshold for this category to encompass all leaks with a detected emission rate greater than 10 kg/hr CH_4 discovered through a fugitive monitoring survey. An emission rate of this magnitude would exceed EPA's proposed large release event threshold of 10 mtCH_4 if it lasted for approximately 42 days. Under existing and proposed EPA regulatory standards, fugitive monitoring occurs at most bi-monthly (six times per year), so it is entirely possible that leaks of 10 kg/hr or greater would go undetected for this length of time and exceed the threshold already proposed by EPA. Requiring leaks with detected emission rates greater than 10 kg/hr CH_4 to be reported will help to ensure that reported emissions reflect what is observed in the field, and can inform the development of EPA's estimates, helping to reduce the large discrepancy with the majority of other independent scientific estimates.

Operators that discover these events will usually have done so as part of a fugitive monitoring survey or due to a notification from a third-party. They are therefore likely to investigate the source and fix the underlying problem, whether voluntarily or for regulatory compliance. Operators that do so should be able to subtract from their reported emissions the emission-factor or engineering calculation estimate associated with the equipment or component that caused the large leak, for the period in which the leak is estimated to have occurred (the duration of leak should be estimated either through use of operational data, or where none is available, the leak should be assumed to have existed since the last leak detection and repair (LDAR) survey). This will ensure emissions are not double counted. For example, in the case of a large emission event attributed to an unlit associated gas flare, an operator could exclude reporting the event if they adjusted the associated gas flaring and venting data to account for the event's anomalous venting.

Footnotes

[41] Carlos Anchondo, Exxon well blowout caused 'extreme' methane leak — study, E&E News (Dec. 17, 2019), https://www.eenews.net/articles/exxon-well-blowout-caused-extreme-methane-leak-study/; Sudhanshu Pandey et al., Satellite observations reveal extreme methane leakage from a natural gas well blowout, 116 PNAS 26,376-81 (Dec. 16, 2019), https://www.pnas.org/doi/10.1073/pnas.1908712116.

[42] California Air Resources Board, Aliso Canyon Natural Gas Leak, https://ww2.arb.ca.gov/our-work/programs/aliso-canyon-natural-gas-leak#:~:text=A%20complete%20calculation%20of%20the,109%2C000%20metric%20tonnes%20of%20methane.

[43] See supra Figure 1. For an explanation of the methodology used to create this inventory, see Environmental Defense Fund, 2019 U.S. Oil & Gas Methane Emissions Estimate (2020), http://blogs.edf.org/energyexchange/files/2021/04/2019-EDF-CH4-Estimate.pdf.

Commenter Name: Karen Knutson
Commenter Affiliation: Chevron
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0184-A1
Comment Excerpt Number: 3

Comment Excerpt: We support the intent of the new reporting category of 'other large release events,' which is defined in the proposed rule as at least 250 metric ton CO_2e per event, and the ability to use engineering estimates associated with well blowouts, blowdowns, and other types of releases. While this proposed category is a good step toward improved methane reporting and such emission sources should be reported, we believe that additional information and a lower threshold per event than the proposed 250 metric ton CO_2e will ultimately be needed for measurement-informed reporting under Subpart W and in support of the Methane Emission Reduction Program (MERP) of the Inflation Reduction Act of 2022. In our view, methane reporting could be further strengthened with methane data from voluntary or regulatory leak detection and repair (LDAR) programs centered on alternative methane detection technologies. We believe a lower threshold for reporting under the 'other large release events' category should be developed based on reasonable minimum detection limit standards for advanced technologies, while allowing operators flexibility to use best available engineering estimates for event duration and avoiding double-counting of emissions detected by advanced technologies that are already reported under the relevant current source category in Subpart W. We recognize updating the 'other large release events' reporting based on advanced technology screenings will require additional work by EPA and follow-on rulemakings.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 10

Comment Excerpt: The proposed definition of "other large release events" specifies that releases greater than just 250 MT CO_2e over the duration of an event (equivalent to 500,000 scf) must be identified and reported whether that event lasted one day or more than a hundred days. Without further definition or clarification, that definition could subject facilities to extensive new monitoring and recordkeeping requirements for operations where a release event would be highly unlikely, infrequent, and for a short duration, but might still be considered "unplanned, unexpected, and uncontrolled." Duke Energy recommends that EPA reconsider applicability of "other large release events" and clarify that the provision will apply only to emission sources that have the potential to release large amounts of natural gas. increasing the proposed reporting threshold from 500,000 scf to 3,000,000 scf (or 1,500 MT CO_2e) per event. This represents the

reporting threshold consistent with incident reporting in the Department of Transportation PHMSA regulations. [49 C.F.R. § 191.3(1)(ii).]

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 9

Comment Excerpt: MSC also believes that the threshold of 250 metric tons per year of CO_2e should be increased and also include and optional threshold of total gas released. In the justification of the emission rate, EPA cited emission factors on the order of 2.5 MMScf per event for well blowouts and 4 MMScf for flaring events. As EPA noted, there are no calculation methodologies for the proposed reporting category. As such, the uncertainty regarding calculated emission will be high, which increases as the reporting threshold is lower. Therefore, MSC proposes a reporting threshold of 1000 metric tons per year and an alternative of 2 MMScf.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 17
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: We appreciate the agency's efforts to improve data collection and reporting to the GHGRP of "other large release events." It is important to increase the data upon which the agency can build its estimates of national emissions for the US GHG Inventory. However, the Industry Trades are concerned by the low threshold upon which such an event would be characterized because of the potential for duplicative reporting. As indicated by EPA in the TSD-W, 250 $mtCO_2e$ represents an average emissions level for such events and could capture more than the average number of normal emission events, like completions of hydraulically fractured wells that are not controlled. These events are already captured by the reporting program, and therefore would not require a new reporting category to be included accurately in the reporting program. If the intent is to capture large release events that are not well characterized in the reporting program like well blowouts and releases, as stated, EPA should select a higher threshold to limit confusion among operators and the potential for double-counting.

At a minimum, the agency must provide language that would eliminate duplicative reporting of emission sources. Only those events that are not already reporting to existing emission source categories under subpart W should be considered for reporting as an Other Large Release Event.

Additionally, the agency should clearly define certain elements that are central to the proposed reporting requirement, such as a complete loss of control for a long duration or as a short period of uncontrolled release within the regulatory language under § 98.238.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 17

Comment Excerpt: The emission threshold for "other large release events" should be increased, and INGAA recommends the "incident" reporting threshold in PHMSA regulations.

INGAA understands EPA's desire to include otherwise unreported "large release events" that may occur in a particular year, and the Proposed Rule preamble discusses examples from recent years. However, the emissions from the two examples are orders of magnitude higher than the proposed threshold. For example, the Aliso Canyon event was 100 times larger than the applicability threshold for natural gas facilities and 10,000 times larger than the proposed threshold of 250 metric tons CO_2e emissions or approximately 500,000 standard cubic feet (SCF) of natural gas. The proposed Subpart W threshold, which is 1% of the applicability threshold, should be increased slightly to a threshold of 3,000,000 SCF of natural gas, or approximately 5.5% of the GHGRP applicability threshold for natural gas facilities, which is consistent with the "incident" reporting threshold in Department of Transportation (DOT) Pipeline Hazardous Materials and Safety Administration (PHMSA) regulations.[26]

INGAA believes that defining a large release event at 1% of the applicability threshold is inappropriately low. As an example, and to provide context, while INGAA strongly disagrees with the proposed increase in T&S leaker emission factors for OGI-based surveys (see Comment 1), a single leak that occurs for a year for four of the six component types would exceed the "large release event" threshold proposed by EPA using those increased EFs. This context speaks to both the inappropriateness of the increase in T&S OGI-based leaker EFs, and the inappropriately low threshold for "other large release events." Surely emissions from a single leak from a common component like a valve or meter, estimated using emission factors that are intended to be indicative of average leak emissions, should not be equated to a "large release event."

Using the PHMS threshold provides consistency with other federal reporting, a precedent from PHMS regulations, and a much more reasonable threshold. And, for comparison to the preamble example, the Aliso Canyon event was still approximately 1,800 times larger than a reporting threshold of 3 million SCF (or approximately 1,400 mt CO_2e emissions).

Footnotes

[26] 49 CFR 191.3(1)(ii).

Commenter Name: Brian K. Woodard
Commenter Affiliation: Chesapeake Energy Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0216-A1
Comment Excerpt Number: 8

Comment Excerpt: The definition of other large release events in 40 CFR 98.238 should make a clear distinction between the existing emissions source categories and this new emissions source category. Page 36983 of the Federal Register notice proposed that "that other large release events include releases from equipment for which the existing calculation methodologies in subpart W would significantly underestimate the episodic nature of these emissions" and that "such events are so rare that they generally do not exist when measurement studies are conducted." EPA needs to further develop its reasoning that the proposed other large release events are both rare and under-represented. For example, it would add clarity to demonstrate the absence of other large release events within the existing emission factors utilized by Subpart W. One possible revision to better define the boundaries between other large release events and existing emission source categories is to structure the reporting under each existing source category rather than creating a new one. This follows the potential precedent set by establishing a malfunctioning pneumatic devices provision within the existing pneumatic devices source, and this avoids potential double-counting of another large release event from an existing reportable source category.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 28

Comment Excerpt: A quantifiable time element must be added to the emissions threshold of "other large release events." We propose that 250 mt of CO_2e released in any 24-hour period be used as the threshold for the definition of "other large release events." This will align with other common state and federal reporting thresholds, which include quantification of emissions over a 24-hour period. This will reduce burden by allowing reporters to align GHG emissions quantifications with other requirements when determining whether release event thresholds are met. A 24-hour quantifiable time element will also ensure that events that are quantified and reported are truly "large" release events, rather than low-level leaks over longer periods of time that would be addressed via the fugitive leak quantification requirements of Subpart W.

To reduce reporter burden, EPA should strive to align this requirement with other federal reporting thresholds. We suggest the large release event threshold should be 3 MMscf to align

with Pipeline and Hazardous Materials Safety Administration reporting requirements. Doing so would help reporters align within their company on reporting and data collection procedures.

If a single leak or event has emissions that exceed the emissions estimated by an applicable methodology included in Subpart W by 250 $mtCO_2e$ or more, EPA is proposing that such releases would be included in the definition of "other large release events" and that reporters would be required to calculate and report the GHG emissions from these events using the proposed requirements for other large release events.

EPA must clearly define the emission sources to be reported as (or excluded from) the "other large release events" emission source category. It would be unworkable and confusing for reporters if EPA were to "mix" reporting requirements for certain sources where sometimes emissions are characterized as "other large release events" and sometimes not.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 13

Comment Excerpt: Under the large release event section of the proposed rule, the Alliance recognizes the additional accuracy and data specificity to be gained by including this potential event, however there are still some details in the application of the rule that require clarification to avoid duplication of reporting. First, the threshold that has been set within the proposal, 250 $mtCO_2e$, represents an average emissions level for some events that are otherwise captured in the rule. EPA needs to clarify those events that are already captured in other portions of the rule will not be also included as large release events, so long as their emissions are quantified and reported with specificity. Alternatively, the EPA could define large release events with a higher threshold such that only exceptional events would be captured within the category. In either case, more clarification is needed for how those events are to be identified and tracked.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 19

Comment Excerpt: EPA should clarify that only "other large release events" that are uncontrolled need to be reported.

EPA proposes adding an additional emissions source to Subpart W reporting requirements called: "other large release events." This "catchall" emissions source is intended to capture abnormal emissions events that are not otherwise captured by Subpart W. It requires operators to calculate and report GHG emissions from other large release events. 87 Fed. Reg. at 36982. The proposed requirement is to calculate and report GHG emissions from other large release events that are at least 250 $mtCO_2e$ per event. The definition of "other large release event" establishes that reporting is only required for emissions resulting from an "unplanned, unexpected, and uncontrolled release to the atmosphere." 87 Fed. Reg. at 37099.

Range believes that it is EPA's intent to require emissions reporting from "other large release events" only where the emissions are uncontrolled. In other words, the release does not only need to be unplanned and unexpected, but it also must be uncontrolled. Range requests that EPA clarify that this is the intent of the regulation.

Commenter Name: Brian K. Woodard
Commenter Affiliation: Chesapeake Energy Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0216-A1
Comment Excerpt Number: 5

Comment Excerpt: It is unduly burdensome for a reporter to respond to any potential external claim, in part because of the ambiguously defined emissions source and the challenge of attributing an identified emissions plume to a specific source. EPA should clarify its intent that data and references external to the reporter are outside the scope of reporting for this source. It is implied that this was EPA's intent since a specific burden analysis of handling information from external parties has not been developed by EPA in the rulemaking docket. Reporters should not be under any obligation to reconcile reported values against external party values because of the high uncertainties, mismatched temporal and special boundaries, and emissions veracity challenges across different parties and methodologies.

Commenter Name: Greg Southworth and Erik Milito
Commenter Affiliation: Offshore Operators Committee (OOC) and National Ocean Industries Association (NOIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0201-A1
Comment Excerpt Number: 7

Comment Excerpt: OOC and NOIA recommend that EPA create a separate, stand alone definition of "large release events" for offshore operations. We recommend the following definition:

Offshore large release event is a gas release that initiates equipment or process shutdown (as used in 30 CFR 250.188(b)(2)) and refers to any gas release that results in a manual or automated response shutdown function for equipment or processes that exceeds 250 metric tons of CO_2e.

Rationale: Offshore operators are required to report gas releases from any type of equipment that results in a manual or automated response shutdown function to the Bureau of Safety and Environmental Enforcement (BSEE). These BSEE reportable events are currently tracked, logged and reported. Therefore, to promote regulatory consistency and efficient reporting it is prudent for EPA to adopt a similar definition for GHG reporting purposes.

Commenter Name: Greg Southworth and Erik Milito
Commenter Affiliation: Offshore Operators Committee (OOC) and National Ocean Industries Association (NOIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0201-A1
Comment Excerpt Number: 8
Excerpt Status: Not Started

Comment Excerpt: OOC and NOIA recommend the following definition be added for offshore operations:

In terms of emissions, offshore loss of well control (as used in 30 CFR 250.188(a)(3)) means the uncontrolled flow of formation or other fluids at the surface (a surface blowout), flow through a diverter, or uncontrolled flow resulting from a failure of surface equipment or procedures.

Rationale: Similar to gas releases, existing BSEE regulations contain definitions for loss of well control for offshore operations. We recommend EPA adopt these definitions for GHG reporting to promote regulatory consistency and reporting efficiency. The BSEE definition at 30 CFR 250.188(a)(3) also includes "underground blowouts" as a type of loss of well control. Underground blowouts are uncontrolled fluid flow between two subsurface formations. Our recommendation does not include a reference to underground blowouts because gas would not reach the atmosphere (no emissions) in that type of event.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 18

Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: EPA must further clarify the definition of large release events for offshore production of oil and natural gas. EPA should include a definition that is consistent with established BSEE definitions and clearly articulate that the methodology for estimating emissions from other large release events should be consistent with existing BSEE requirements under 30 CFR 250.188(b)(2) and 30 CFR 250.188(a)(3) as well as the proposed EPA threshold. Further, API fully supports the comments being submitted by the Offshore Operators Committee.

Commenter Name: Greg Southworth and Erik Milito
Commenter Affiliation: Offshore Operators Committee (OOC) and National Ocean Industries Association (NOIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0201-A1
Comment Excerpt Number: 3

Comment Excerpt: OOC and NOIA recommend that the proposed regulatory language be modified to read as follows:

98.232(b)

For offshore petroleum and natural gas production, report CO_2, CH_4, and N_2O emissions from equipment leaks, vented emission, and flare emission source types as identified in the data collection and emissions estimation study conducted by BOEM in compliance with 30 CFR 550.302 through 304 and CO_2 and CH_4 emissions from offshore large release events. Offshore platforms do not need to report portable emissions.

Rationale: See recommendations proposing a new definition of offshore large release event.

Commenter Name: Greg Southworth and Erik Milito
Commenter Affiliation: Offshore Operators Committee (OOC) and National Ocean Industries Association (NOIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0201-A1
Comment Excerpt Number: 6

Comment Excerpt: OOC and NOIA recommend the proposed regulatory text be modified as follows:

Other large release events or offshore large release events. You must indicate whether there were any other large release events or offshore large release events from your facility during the reporting year. If there were any other large release events or offshore large release events, you must report the total number of other large release events or offshore large release events from

your facility that occurred during the reporting year and, for each other large release event, report the information specified in paragraphs (y)(1) through (8) of this section.

(1) Unique release event identification number (*e.g.*, Event 1, Event 2).

(2) The approximate start date, start time, and duration (in hours) of the release event.

(3) A general description of the event. Include:

(i) Identification of the equipment involved in the release.

(ii) A description of how the release occurred, from one of the following categories: fire/explosion, offshore loss of well control, gas well blowout, oil well blowout, gas well release, oil well release, pressure relief, large leak, and other (specify)...

Rationale: See recommendations proposing a new definition of offshore large release event and offshore loss of well control.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 19
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: We support the use of new monitoring, detection, and quantification methodologies as well as engineering estimates to estimate the volume of emissions associated with other large release events.

Commenter Name: Brian K. Woodard
Commenter Affiliation: Chesapeake Energy Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0216-A1
Comment Excerpt Number: 3

Comment Excerpt: The other large release events methodology needs to be revised so that reported emissions are complete, consistent, correct, and verifiable. EPA's proposed addition of the other large release events category, and the proposed reporting methodology, has the advantages of reporting flexibility and including any additional relevant GHG emissions of

significant magnitude. It also has the disadvantage of introducing GHG emissions inconsistencies of significant magnitude. Different entities can interpret the proposed methodology text inconsistently. As proposed, it is unclear how a reporter can affirmatively demonstrate compliance to a common standard of completeness and correctness. EPA should revise its proposed regulation to ensure emissions reported under this source are consistent and reasonable both across reporters and over time. Additionally, third-party verification is not possible as-proposed due to the generic nature of the methodology—a third party cannot readily verify against a specific standard in the proposed text. EPA needs to revise the proposed methodology to be verifiable so that it is not in conflict with proposed regulations stemming from the Securities and Exchange Commission and/or the Inflation Reduction Act.

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0230-A1
Comment Excerpt Number: 10

Comment Excerpt: The "other large release events" source cannot be successfully audited for the IRA and proposed SEC rule as-written. EPA needs to provide enough methodology guide posts to allow for third party assurance. For example, reporters following a specific set of steps should be deemed as complying with this part of Subpart W reporting. EPA should develop a more robust technical support document section explaining how these emissions are identified and quantified. EPA should provide more structure to the regulation to ensure emissions reported under this source are done so with consistency and reasonableness both across reporters and over time. For example, reporters should not be under any obligation to reconcile reported values against third party values because of the high uncertainties across different methodologies. EPA's decision to use a 250 metric tons threshold is also arbitrary, and EPA needs to support the threshold with a complete technical evaluation. These issues are fundamentally problematic in the context of the methane tax and possible audits.

Commenter Name: Brian K. Woodard
Commenter Affiliation: Chesapeake Energy Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0216-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA should revise the methodology to retain the flexibility of the proposed regulation while providing acceptance criteria that is less likely to cause multiple or conflicting interpretations. Reporters should be able to develop and implement a repeatable and verifiable process for reporting other large release events, and adherence to this process should assure

compliance with GHG reporting. A reporter should be able to create a process to 1) review its own operations and emissions logs, 2) adjust for double counting issues with other reported GHG sources, and 3) select and apply emissions estimation methods that meet transparency criteria. Completion of this reporter-created process should provide an affirmative defense for the completeness and correctness of reported emissions.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 18

Comment Excerpt: Adding reporting for other large release events addresses anomalies that may occur that are not covered by Subpart W methodologies. For transmission compressor stations, Subpart W includes an annual measurement to assess anomalous operation — *i.e.*, transmission tank vent screening and measurement. The associated source for that measurement is not the tank, but rather a leaky or stuck condensate tank dump valve. In effect, that measurement was required so that EPA could assess the frequency and magnitude of dump valve leakage or anomalous performance. As discussed in comments above, INGAA recommends allowing emission factor-based estimates rather than ongoing annual transmission tank measurements. In addition, by adding reporting for "other larger release events," anomalous dump valve performance would be addressed regardless of the transmission tank reporting requirement.

PRCI compiled data[27] shows that the related emissions "on average" were relatively minor based on 2015 and 2016 Subpart W data, with a facility-level emission factor of approximately 300 mt CO_2e per year, but only about 10% of facilities finding a leaky dump valve. Interestingly, the PRCI data[28] indicates just over 50 instances for both 2015 and 2016 where scrubber dump valve leakage occurred, and for those leaks, the average leak rate was just approximately 310 SCF per hour. That equates to 2.7 million SCF if the leak occurs for an entire year, or similar in magnitude to the PHMSA based threshold discussed in this comment and recommended for Subpart W other large release events. Event frequency and magnitude for scrubber dump valves have likely decreased since that data was collected as mandatory or voluntary LDAR programs have become more common for compressor stations. Analysis of data available to EPA from eleven years of Subpart W measurements would document that trend. Thus, INGAA recommends that EPA eliminate the transmission storage tank requirements in Subpart W since the new "other large release event" requirement in § 98.233(y) would address those emissions when a leaking dump results in emissions exceeding the threshold.

Footnotes

[27] PRCI Report Catalog No. PR-312-16202-R03, "Methane Emissions from Transmission and Storage Subpart W Sources," August 2019.

[28] PRCI August 2019 Report, Figure 8 and Section 5

A-16. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for combustion

Commenter Name: William Hittie
Commenter Affiliation: INNIO Waukesha Gas Engines, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0195-A1
Comment Excerpt Number: 1

Comment Excerpt: INNIO Waukesha agrees with EPA's finding that there is methane combustion slip from all compressor engine types at oil and gas facilities throughout the natural gas supply chain, and that combustion slip is dependent on the type of engine, not the application.

Current subpart W methodologies do not distinguish between rich-burn and lean-burn engines and are significantly underestimating methane emissions from natural gas combustion from compressor engines.

Commenter Name: William Hittie
Commenter Affiliation: INNIO Waukesha Gas Engines, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0195-A1
Comment Excerpt Number: 3

Comment Excerpt: INNIO Waukesha supports EPA's proposal to use subpart W specific methane emission factors and combustion efficiency values by engine design class (*e.g.* 2-stroke lean-burn, 4-stroke lean-burn, 4-stroke rich-burn) in a proposed new Table W–9 and revised Equation W–39B. These proposed revisions to the subpart W methodology are more representative of operational emissions and would improve the accuracy of emissions data submitted to EPA. INNIO Waukesha supports EPA's conclusion that the proposed approaches incorporate the best available data and emission factors. As shown in the table below, the proposed 4-stroke lean burn and 4-stroke rich burn emission factors are in good agreement with data taken in the INNIO Waukesha engine laboratory under tightly controlled conditions with quality-controlled measurement systems.

All engine original equipment manufacturers (OEMs) have their own proprietary tools to provide predicted performance information for equipment operating under site conditions. OEM tools allow producers and operators to apply for emission permits using the OEM provided data on criteria pollutant emissions. In addition to criteria pollutants, INNIO Waukesha has provided CH_4 emissions data since 2013 for currently manufactured engine models—and is the only engine OEM that provides CH_4 emissions data. The process for obtaining emissions and performance data as inputs into the performance prediction tool involves months of running the engine in an engine test laboratory environment, under a range of speeds, loads, ambient

temperature & humidity, simulated elevation, and fuel quality. The data needs continuous checking for data quality and completeness and is then processed with Design of Experiments software to feed into INNIO's Waukesha engine performance prediction tool. The process is sufficiently time consuming and costly that INNIO Waukesha offers this for currently manufactured engines only.

INNIO Waukesha findings indicate the CH_4 emissions from both its rich-burn and lean-burn models are within +15% of the proposed emission factors as shown in Table 1 below.

Engine Type	Table W–9 Emissions Factor (kg/CH_4/MMBtu)	INNIO Waukesha EngCalc Calculated Emissions Factor (kg/CH_4/MMBtu)	% Difference
4SLB	0.522	0.469	-10%
4SRB	0.045	0.041	-10%

Commenter Name: William Hittie
Commenter Affiliation: INNIO Waukesha Gas Engines, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0195-A1
Comment Excerpt Number: 5

Comment Excerpt: INNIO Waukesha further supports EPA's proposal to use subpart W specific emission factors and combustion efficiency values by engine design class (*e.g.*, 2-stroke lean-burn,4-stroke lean-burn, 4-stroke rich-burn) in a proposed new Table W–9 and revised Equation W–39B versus alternate methodologies based on the following:

Stack Testing: Based upon INNIO Waukeshoa's experience, OEM and site specific stack testing is difficult to ensure quality control and can lack consistency due to varying site conditions. The potential for variability within testing is mitigated through the use of EPA Part 60 testing methods. For example, an operator of a reciprocating compressor may conduct stack testing to demonstrate compliance with NSPS Subpart JJJJ. The operator would be required to submit a testing protocol to outline the data collection methods and a testing report with significant volumes of data to demonstrate the validity of the testing results. As the Greenhouse Gas Reporting Program does not include the same provisions for review and acceptance of data and the ability of the agency to do so would be limited given the number of potential sources, the use of stack testing data as an alternative method serves to introduce data quality and completeness concerns not inherent to the currently proposed approach. Furthermore, the ability to leverage one-time field-testing events increases the variability within the submitted datasets, thus increasing the uncertainty within EPA's inventory. The currently proposed emission factors and combustion efficiencies are based upon testing data from large data sets, serving to minimize the impacts of statistical outliers and provide a consistent, comparable approach to the source category.

Commenter Name: William Hittie
Commenter Affiliation: INNIO Waukesha Gas Engines, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0195-A1
Comment Excerpt Number: 6
Excerpt Status: Not Started

Comment Excerpt: INNIO Waukesha further supports EPA's proposal to use subpart W specific emission factors and combustion efficiency values by engine design class (*e.g.*, 2-stroke lean-burn,4-stroke lean-burn, 4-stroke rich-burn) in a proposed new Table W–9 and revised Equation W–39B versus alternate methodologies based on the following:

OEM Specifications: Equipment used in critical applications such as natural gas compression is robustly designed for long life to withstand harsh and varying operating conditions and is typically rebuilt multiple times before being replaced. INNIO Waukesha provides parts and technical support for engines built up to and sometimes beyond 50+ years. It is not cost effective for engine manufacturers to provide OEM CH_4 emissions data for all legacy engine models. Additionally, natural gas transmission stations may be powered by integral engine/compressors from OEMs that ceased business operations in the 1990s (*e.g.*, Cooper Bessemer, Dresser Rand, Ingersoll Rand, Worthington, and Clark). It is estimated that there are at least 5000 of these older style integral engines operating, some of which date back as far as the late 1940's. OEM specification details likely not available for this equipment.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 1

Comment Excerpt: INGAA supports the emission factor updates for combustion exhaust methane emissions from reciprocating engines but recommends flexibility that allows operators to use emission factors, when appropriate, that reflect technological innovation that decreases emissions.

The Proposed Rule updates combustion exhaust methane emission factors (EF) for natural gas fired reciprocating engines that drive compressors. INGAA has consistently supported more accurate methane EFs for natural gas-fired reciprocating engines since the original 2009 Subpart C proposal.[7] As discussed in previous INGAA comments, the longstanding Subpart C EF is adequate for some combustion equipment (*e.g.*, turbines, boilers) but under-estimates combustion exhaust methane emissions from reciprocating engines. The proposed emission

factor updates, presented in Table W–9, represent reasonable average values and INGAA supports this revision.

Footnotes

[7] For example, see EPA-HQ-OAR-2008-0508-0480, INGAA Comments on Proposed GHG Reporting Rule, June 9, 2009; and INGAA presentation for meeting with EPA staff on November 19, 2019.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 57

Comment Excerpt: We generally support EPA's proposal to update the emission factors for uncombusted methane emissions (*i.e.*, "methane slip") from compressors.

For example, the GHGI uses the same emission factor for big and small engines, both rich- and lean-burn. The GHGRP also uses the same emission factor for all sizes and types, but that factor is much smaller than the GHGI's. Two other sources, Zimmerle et al. (2019) and AP-42 use different factors for types. We believe that it is appropriate to use AP-42 emission factors for 2SLB engines, and Zimmerle emission factors for 4SLB and 4SRB engines for the reasons set forth below.

The use of different factors for rich burn versus lean burn engines is well supported and we agree with EPA's proposal. Vaughn et al. (2019) (part of the same DOE G&B Study as Zimmerle et al. (2019))[133] supports the use of different emission factors for 4SLB engines depending on the model and size of the engine. As seen in Figure 4, the mean methane slip measured from 4SLB engines was 1.15 lb/MMBtu (0.522 kg/MMBtu), while mean methane slip measured from 4SRB engines was much lower, at 0.10 lb/MMBtu (0.045 kg/MMBtu).

[See DCN EPA-HQ-OAR-2019-0424-0241-A1, p. 46 for Figure 4: Four-stroke, Rich-burn & Four-stroke, Lean-burn]

However, there is a clear stratification in emissions within 4SLB engines, with certain engine models clearly having higher average emissions than others. Because different models emitted more (or less) than the AP-42 emission factor, the authors suggest that the "characteristics of these engine families that give rise to this difference may warrant a further stratification of the 4SLB emission factor category when such data are available."[134] Figure 5 shows that 4SLB engines in the Caterpillar G3500 have average emissions 0.52 lb/MMBtu (0.24 kg/MMBtu) and a different model, the Caterpillar G3600 series have average emissions of 1.41 lb/MMBtu (0.64 kg/MMBtu). Based on the measurements in Vaughn et al. (2021), we support the further differentiation in emission factors for methane slip based on the engine model.

[See DCN EPA-HQ-OAR-2019-0424-0241-A1, p. 46 for Figure 5: Four-stroke, Lean-burn, G3500 & Four-stroke, Lean-Burn, G3600]

Footnotes

[133] Vaughn et al. Methane Exhaust Measurements at Gathering Compressor Stations in the United States, Environ. Sci. Technol. (2021) https://pubs.acs.org/doi/10.1021/acs.est.0c05492?290to=supporting-info.

[134] Vaughn et al., Methane Exhaust Measurements at Gathering Compressor Stations in the United States, Supporting Volume 2: Compressor Engine Exhaust Measurements, at 18, available at https://mountainscholar.org/bitstream/handle/10217/194542/DATAENEI CharMethEmiss SupportV2.pdf?sequenc e=1 &isAllowed=y.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 15

Comment Excerpt: We are generally supportive of EPA's proposal to update the emission factors for uncombusted methane emissions in exhaust (*i.e.*, "methane slip") from compressor engines.

For example, the U.S. Greenhouse Gas Inventory ("USGHGI") uses the same emission factor for large and small engines, both rich- and lean-burn. The GHGRP uses the same factors for all sizes and types as well, but that factor is much smaller than the USGHGI. However, two other sources, Zimmerle et al. (2019) and AP-42 use different factors for different types of engines. We agree that it is appropriate to use AP-42 emission factors for 2SLB engines, and Zimmerle emission factors for 4SLB and 4SRB engines.

However, Vaughn et al. (2019) (part of the same DOE G&B Study as Zimmerle 2019)[65] further supports the use of different emission factors for 4SLB engines depending on the model and size of the engine. As seen in Figure 5, the mean methane slip measured from 4SLB engines was 1.15 lb/MMBtu (0.522 kg/MMBtu), and mean methane slip measured from 4SRB engines was of 0.10 lb/MMBtu (0.045 kg/MMBtu), much lower than the measured mean methane slip of from 4SLB.[66] The use of different factors for rich burn vs. lean burn engines is well supported and we support EPA's proposal to do so.

[See DCN EPA-HQ-OAR-2019-0424-0248-A1, pg. 31, for Figure 5: Combustion slip emission rates for rich-burn and slow-burn engines from Vaughn et al. (2019).]

However, there is a clear stratification in emissions within 4SLB engines, as seen in Figure 5, with certain engine models clearly having higher average emissions than others. Because different models emitted more (or less) than the AP-42 emission factor, the authors suggest that the "characteristics of these engine families that give rise to this difference may warrant a further stratification of the 4SLB emission factor category when such data are available."[67] Figure 6

shows that 4SLB engines in the Caterpillar G3500 series have average emissions of 0.52 lb/MMBtu (0.24 kg/MMBtu) while engines in the larger Caterpillar G3600 series have average emissions of 1.41 lb/MMBtu (0.64 kg/MMBtu). Based on the measurements in Vaughn, et al. (2021), CATF supports further differentiation in emission factors for methane slip to be based on the engine model.

[See DCN EPA-HQ-OAR-2019-0424-0248-A1, pg. 32, for Figure 6: Combustion slip emission rates for two 4SLB engines models from Vaughn et al. (2019).]

Footnotes

[65] Vaughn et al., Methane Exhaust Measurements at Gathering Compressor Stations in the United States, 55 Env't. Sci. Tech. 1190 (2021), https://pubs.acs.org/doi/10.1021/acs.est.0c05492.

[66] Id., at 1192.

[67] Vaughn et al, Methane Exhaust Measurements at Gathering Compressor Stations in the United States, Supporting Volume 2: Compressor Engine Exhaust Measurements, at 18, available at https://mountainscholar.org/bitstream/handle/10217/194542/DATAENEI_CharMethEmiss_SupportV2.pdf.

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 11

Comment Excerpt: Combustion

EPA has proposed to account for methane slip or "combustion slip" using default efficiency values based on "engine design class." If any change here is incorporated, PBPA would recommend allowing the option of using truly engine-specific combustion efficiency factors based on manufacturer specifications or stack testing taking into consideration site-specific factors, as opposed to the classes put forward by EPA.

Commenter Name: Greg Southworth and Erik Milito
Commenter Affiliation: Offshore Operators Committee (OOC) and National Ocean Industries Association (NOIA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0201-A1
Comment Excerpt Number: 9

Comment Excerpt:

Compressor-driver factor engine design class	Emission factor (kg CH_4/mmBtu)
2-stroke lean-burn	0.655
4-stroke lean-burn	0.522
4-siroke rich-burn	0.045

Table W–9 does not contain methane emission factors for natural-gas driven turbines. OOC and NOIA recommend that EPA incorporate emission factors by allowing the use factors from Table C–2 for turbines and allow the use of site-specific emission factors based on manufacturers' data or available equipment engine tests.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 6
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: Table W–9 does not contain methane emission factors for natural gas-driven turbines, only for natural gas-fired compressor-drivers. We recommend that EPA incorporate emission factors for natural gas-driven turbines by allowing the use of factors from Table C–2 for turbines and allow the use of site-specific emission factors based on manufacturers' data or available equipment engine tests.

Commenter Name: Tamara S. Maddox
Commenter Affiliation: Alaska Oil & Gas Association (AOGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0214-A1
Comment Excerpt Number: 8

Comment Excerpt: Under the current regulations, AOGA members that operate turbine compressor-drivers apply the default destruction efficiency of 0.995 for calculating greenhouse gas emissions from these units. The proposed rule includes new destruction efficiencies based on research that was seemingly completed solely on engines as the compressor-drivers. There are locations in Alaska which utilize turbines to drive centrifugal compressors to reinject gas downhole for artificial lift and enhanced oil recovery as discussed earlier in this letter. The research relied on for the proposed revision does not evaluate the performance of turbine compressor-drivers, and therefore, should not provide a basis for revising the destruction

efficiency for turbine compressor-drivers. Accordingly, until further research is conducted specifically on the destruction efficiency of turbine compressor-drivers, EPA should keep the default destruction efficiency for turbine compressor-drivers at 0.995.

AOGA recommends that the variable ŋ for proposed equations W–39A and W–39B be updated to include turbine compressor-drivers with a default value of 0.995.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 20
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: The Industry Trades agree with the agency that some of the existing emission factors for incomplete combustion or "methane slip" are inaccurate. However, as new studies are underway that could inform the agency on new approaches or improved emission profiles, we encourage the agency to build in the potential to use this data in a future rulemaking as soon as possible. The studies referenced by EPA in the TSD-W are all in reference to uncontrolled emissions from engines - additional data on controlled sources should be developed and included as a potential emission factor. EPA should also allow for reporters to use actual testing data, when provided by operators.

We recommend that EPA revise the definition of variable n in equations W–39A and W–39B to allow for use of alternate combustion efficiencies if established by operators based on acceptable testing methodologies such as initial or annual stack testing results. Doing so would add flexibility and could contribute to improving EPA's understanding of combustion efficiencies by engine type.

While the studies used to establish the combustion efficiency for natural gas-fired engines did not appear to specifically include turbine compressor-drivers, we recommend that EPA expand the use of variable n to include turbine compressor-drivers with a default combustion efficiency value of 0.995. Turbine compressor-drivers must be addressed by this variable as certain locations use turbine compressor-drivers to reinject gas for enhanced oil recovery. In the absence of testing data provided by operators, facilities should be able to use the default 0.995 value.

Commenter Name: Not provided
Commenter Affiliation: Environmental Data Accuracy Coalition (EDAC)
Commenter Type: Environmental Organization
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0227-A1
Comment Excerpt Number: 1

Comment Excerpt: EPA is proposing new CH_4 emissions factors specifically for natural gas RECIP compressor drivers in Table W–8 for Subpart W reporters. However, the new proposed emissions factors in Table W–8 should be applicable to all RECIPs independent of the driven equipment since methane slip from RECIPs is an artifact inherent in RECIP combustion technology and independent of the driven equipment. For example, with a similar load demand, a particular RECIP driving a generator set or a mechanical pump will have similar methane slip as the same RECIP driving a natural gas compressor. The current default factor of 0.001 kg CH_4/mmbtu for natural gas fuel listed in Table C–2 is not appropriate for any RECIP engine. Therefore, all RECIPs, independent of the driven equipment, should report using the Table W–8 emissions factors for CH_4, across all industry segments.

Commenter Name: Not provided
Commenter Affiliation: Environmental Data Accuracy Coalition (EDAC)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0227-A1
Comment Excerpt Number: 2

Comment Excerpt: The emissions factors proposed in Table W–8 should also apply to the stationary fuel combustion category in Subpart C. The proposed footnote 1 to Table C–2 should be altered per below to reflect accurate reporting of RECIP CH_4 emissions: 'Reporters subject to subpart W of this part may only use the default CH_4 emission factor for natural gas-fired combustion units that are not ~~compresser dryers~~ **reciprocating engines**. For natural gas-fired co~~mpresser dryers~~ **reciprocating engines** at facilities subject to subpart W, **or any other subparts of this part,** reporters must use the applicable CH_4 emission factor from Table W–8 to subpart W of this part.'

Commenter Name: Not provided
Commenter Affiliation: Environmental Data Accuracy Coalition (EDAC)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0227-A1
Comment Excerpt Number: 3

Comment Excerpt: Also, the heading for Table W–8 should be altered as shown: Table W–8 to Subpart W of Part 98—Default Methane Emission Factors for Natural Gas-Fired ~~Compressor Drivers~~ **Reciprocating Engines**

Accordingly, the text in Subparts C and W should be revised where appropriate per the above comments where CH_4 emissions from RECIP engines are referenced. Specifically in 98.236(z)

(2)(1) for combustion equipment at onshore petroleum and natural gas production facilities, onshore petroleum and natural gas gathering and boosting facilities, and natural gas distribution facilities, the text should be modified as noted: 'The type of combustion unit. For internal fuel combustion units of any heat capacity ~~that are compressor drivers~~, you must also specify the design class as: 2-stroke lean-burn, 4- stroke lean-burn, 4-stroke rich-burn, or other **and calculate methane emissions using the default emissions factors in Table W–8**.'

Commenter Name: Not provided
Commenter Affiliation: Environmental Data Accuracy Coalition (EDAC)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0227-A1
Comment Excerpt Number: 4

Comment Excerpt: EPA acknowledges methane slip from RECIPs is independent of the process application as the Preamble to this rule revision states that (emphasis added):

Based on the EPA's review and analysis, there appears to be combustion slip for all compressor engine types at oil and gas facilities. In addition, while the recent studies are focused on the Onshore Petroleum and Natural Gas Gathering and Boosting industry segment, **the EPA's literature review found the presence of combustion slip in different industry segments, so it appears that combustion slip is dependent on the type of engine and not the application** (*i.e.*, we expect combustion slip from compressor engines regardless of the industry segment).

The statement highlighted in bold is accurate however the underlined corollary is somewhat misleading in that it references 'compressor engines' where it should state 'reciprocating engines.' EPA is encouraged to review the literature once again, for all RECIP engines and not just compressor drivers, to observe that indeed, methane slip is independent of the application (*i.e.*, the driven equipment). The emissions factors in Table W–8 should apply for all RECIPs firing natural gas, across all industry segments and process applications, and not just for compressor drivers.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 27

Comment Excerpt: Comment: The elaborate structure dividing reporting requirements for similar type sources and processes among Subparts C and W has long been a source of confusion, administrative difficulty, and cost for affected facilities. For reporting consistency and to improve transparency, GPA requests that EPA consolidate combustion source calculation and

reporting (40 C.F.R. §§ 98.233(z) and 98.236(z)) for all Petroleum and Natural Gas Systems segments under Subpart C — General Stationary Fuel Combustion Sources.

As currently structured, Subpart W requires the Production segment, Gathering & Boosting segment, and the Distribution segment to calculate and report their combustion emissions under Subpart W. All other segments of the industry calculate and report combustion emissions under Subpart C (40 C.F.R. § 98.232(k)). This includes the majority of the segments in the industry: onshore natural gas processing, onshore natural gas transmission compression, underground natural gas storage, liquefied natural gas ("LNG") storage, LNG import and export equipment, onshore natural gas transmission pipelines.

It has never been clear why EPA would treat the Production, Gathering & Boosting, and Distribution segments differently than the other industry segments in this regard—the source of the emissions, combustion, is the same. GPA has commented to EPA in previous rulemaking proceedings addressing Subpart W that the Agency's unusual approach with respect to these facilities, inconsistently piecing together combustion-related emission reporting requirements across various subparts, lacks a clear rationale or precedent.[31] Indeed, because Subpart C is proposed to reference Subpart W emission factors for certain sources, and Subpart W will continue to reference Subpart C calculation methods for certain sources, the utility of housing combustion emission requirements under two different subparts will not only remain unclear and confusing but become more so.

Further this complex system with its many cross-references creates multiple and unnecessary opportunities for mistakes in the regulatory text itself, future agency guidance, and for companies attempting to implement the rule. As noted in the Federal Plain Language Guidelines, "There are several ways to deal with cross-references. The best is to organize your material so you can eliminate the need for cross-references."[32]

These issues are especially complex for companies that must report under the conflicting reporting regimes for different facility types that are treated differently under Subpart C and Subpart W, and the costs of maintaining separate systems for such facilities are not insignificant.

As EPA has previously explained, the purpose of Subpart W was to require the calculation and reporting of vented, fugitive, and flare combustion emissions, while "stationary combustion emissions are included in Subpart C."[33] Without providing a straightforward rationale for failing to adhere to that basic practice by including some combustion emissions in Subpart W, EPA has acted arbitrarily. An agency's basic obligation under the law is to assess the relevant facts and provide a reasoned rationale for its choice of action. As the D.C. Circuit has explained, agencies must "consider[] the relevant factors and articulate[] a rational connection between the facts and its choices." [34] Although it is permissible for an agency to make a decision that contradicts an earlier approach to a similar situation, when so doing, it must "supply a reasoned analysis for the change."[35] On the other hand, when an agency treats similarly situated parties differently, taking conflicting approaches based on the same or similar data, "[s]uch inconsistent treatment is the hallmark of arbitrary agency action," and requires further explanation from EPA. [36]

Here, the approach EPA has taken with respect to Production, Gathering & Boosting, and Distribution differs from and conflicts with the approach taken for other segments in the natural gas industry. The unusual division of reporting for these segments also differs from EPA's

approach under other subparts of the GHGRP. EPA has supplied no clear rationale, and none is obvious.

Under these circumstances, the appropriate course of action is for EPA to move all combustion reporting under Subpart C. That would also allow EPA to streamline data aggregation and reporting for the annual Inventory of US GHG Emissions and Sinks and for other consumers of the reported data. Moving all combustion requirements to Subpart C could be accomplished by "lifting and shifting" regulatory text related to calculations, monitoring, and reporting from Subpart W to Subpart C. GPA is not proposing any changes to existing requirements related to combustion or sector threshold determinations.

Footnotes

[31] See Gas Processors Association, Comments on Greenhouse Gas Reporting Rule: 2015 Revisions and Confidentiality Determinations for Petroleum and Natural Gas Systems; Proposed Rule (Docket EPA-HQ-OAR-2014- 0831) at 24-26, 34 (Feb. 24, 2015).

[32] Federal Plain Language Guidelines at 83 (emphasis in original) (May 2011)

[33] 69 Fed. Reg. 18,576, 18,611, 18,614 (Apr. 12, 2010).

[34] Nat. Res. Def. Council, Inc. v. EPA, 194 F.3d 130, 136 (D.C. Cir. 1999).

[35] Jicarilla Apache Nation v. DOI, 613 F.3d 1112, 1119 (D.C. Cir. 2010).

[36] Catawba Cnty., NC v. EPA, 571 F.3d 20, 51 (D.C. Cir. 2009).

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 10

Comment Excerpt: The reporting requirements for combustion emissions should be moved from Subpart W to Subpart C. The greenhouse gas reporting rule currently requires some combustion emissions in the oil and gas industry to be calculated and reported under Subpart W while other combustion emissions must be calculated and reported under Subpart C. This division creates inefficiency and unnecessary confusion, particularly where, as is often the case, a company owns and operates equipment covered by both Subparts and thus is required to calculate and report the company's combustion emissions under two completely different reporting rule structures. It would be much more efficient if all combustion sources were covered by a single subpart, and we see no reason to keep some combustion reporting out of Subpart C, the entire point of which is to prescribe calculation and reporting requirements from combustion sources.

Moving combustion emission calculation and reporting requirements from Subpart W to Subpart C would reduce confusion and eliminate the current cross-references from Subpart W to Subpart C, and vice versa, thus simplifying and streamlining the rule provisions. Such a revision would also make the data being gathered more user friendly, as it would result in the collection in one

Subpart of all data related to combustion, in contrast to the current situation where combustion data is split across two different Subparts. It would have the further benefit of matching how other industry segments report combustion emissions, *i.e.*, under Subpart C, rather than the current confusing and unnecessarily complicated method of having some oil and gas industry segments report combustion emissions under one Subpart while other parts of the same industry report under a different Subpart.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 14

Comment Excerpt: We request that EPA move the combustion source calculations for the Production, Distribution, and Gathering and Boosting segments from Subpart W to Subpart C, to provide consistent combustion source reporting across all Petroleum and Natural Gas Systems and reduce the burden of reporting combustion source emissions across multiple Subparts. Consolidating combustion source calculations in Subpart C will be more efficient for reporters and reduce any confusion related to reporting these sources in two different subparts, especially given that each subpart references calculations and emission factors located in the other subpart. This effort should simply require moving language from Subpart W into Subpart C, and it should not require any changes to the calculation methodology or the sources being reported. Additionally, we request EPA allow reporters the option to conduct engineering studies to determine the best emission data for their sources or allow the collection of actual emissions. This would enable reporters to better manage its operations to reduce and/or eliminate emissions from these sources.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 21
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: The Industry Trades agree that EPA should allow the use of subpart C methodologies for a wider variety of fuels. However, EPA has not provided sufficient information to justify the composition threshold of natural gas in determining between use of subpart C or subpart W. While EPA, in the TSD-W, has concluded that the appropriate threshold criteria for use of subpart C include a natural gas composition of 85% CH_4, this threshold does

not appear to represent any national or basin-wide average of the composition of produced natural gas. EPA must provide additional information regarding the election of the 85% CH_4 composition threshold as a criteria for use of subpart C methodologies. The revisions proposed by EPA do not increase flexibility, nor do they improve clarity for operators.

While EPA had previously established specific requirements for combustion within subpart W, now that EPA is revising both subparts W and C, EPA should consider moving all combustion calculations and reporting requirements from subpart W to subpart C in order to reduce the potential for confusion among reporters. EPA need not adjust the methodologies for subpart W, but move all combustion methodologies and requirements into subpart C. This may require some specific adjustments to the definitions of facilities to align with subpart W, but will reduce confusion by ensuring that all combustion-related emissions are located in a single subpart.

Additionally, to improve operators' abilities and opportunities to include data based on acceptable testing methodologies, EPA should allow for the use of such data in place of the emission factor for combustion in Table W–9 at any time when the fuel gas fits the definitions of proposed § 98.233(z)(1)(ii) or § 98.233(z)(2)(ii).

Commenter Name: Douglas Jordan
Commenter Affiliation: Western Midstream Partners, LP
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0202-A1
Comment Excerpt Number: 9

Comment Excerpt: Some of the proposed rule changes we encourage, and support include: Application of new emissions factors for natural gas-fired compressor engines and turbines, which incorporate "methane slip." However, we recommend that emissions from these sources be included under 40 CFR Part 98, Subpart C.

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 3

Comment Excerpt: Facilities in the Onshore Petroleum and Natural Gas Production, Onshore Petroleum and Natural Gas Gathering and Boosting, and Natural Gas Distribution industry segments calculate emissions in accordance with the provisions in 40 CFR 98.233(z) and report combustion emissions per 40 CFR 98.236(z). Reporters in other industry segments calculate and report combustion emissions under subpart C (General Stationary Fuel Combustion Sources). This is a more efficient and straightforward process for reporters.

We request that EPA move the combustion source calculations for the Production, Distribution, and Gathering and Boosting segments from Subpart W to Subpart C, to provide consistent combustion source reporting across all Petroleum and Natural Gas Systems and reduce the burden of reporting combustion source emissions across multiple Subparts. Consolidating combustion source calculations in Subpart C will reduce any confusion related to reporting these sources in two different subparts, especially given that each subpart references calculations and emission factors located in the other subpart. This effort should be straightforward — merely moving language from Subpart W into Subpart C, and it should not require any changes to the calculation methodology or the sources being reported.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 1

Comment Excerpt: Williams is supportive of EPA's proposed update to the emission factors for 2-stroke lean-burn, 4-stroke lean-burn, and 4-stroke rich-burn reciprocating engines. These higher emissions factors are similar to emissions factors published in "AP-42 - Compilation of Air Pollutant Emissions Factors," EPA's primary compilation of EPA emissions factor information. The new emissions factors are also similar to methane emissions factors published by Caterpillar, the largest manufacturer of reciprocating engines that are used in the natural gas industry. Williams recommends that the updated emissions factors in Table W–9 be moved to Subpart C along with all other combustion-related requirements in Subpart W to simplify and improve reporting.

[* See Proposed Rule, 87 Fed. Reg at 36984 ("For compressor engines in those subpart W industry segments that combust natural gas and qualify to determine emissions using the subpart C calculation methodologies per 40 CFR 98.233(z)(1) and proposed new 98.233(z)(2), we are proposing that reporters would use subpart-W specific emission factors by engine design class (*e.g.*, 2-stroke lean-burn, 4-stroke lean-burn, 4-stroke rich-burn, or other) in proposed new Table W–9 rather than the emission factors in Table C–2.").]

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 14

Comment Excerpt: Duke Energy takes no issue with the proposed update to reciprocating engine methane exhaust emission factors; however, Duke Energy believes it is very important to

allow operators the flexibility to use test data showing improved emission factors so operators can account for methane reduction efforts from improved technology.

Duke Energy takes no issue with the updated combustion exhaust methane emission factors (EFs) for natural gas-fired reciprocating engines that drive natural gas compressors. However, advancements in combustion technologies continue to show reduced exhaust methane. Operators will need the flexibility to either use the proposed EFs or use test data from OEM and operator testing in order to account for the new technology benefits and provide accurate reporting for GHG emissions. When operators can support a reduction in exhaust methane contrary to the prescribed emission factors, operators should be permitted to report the actual emissions in lieu of the emission factors for reporting purposes.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 11

Comment Excerpt: The MSC requests the ability to use manufacturer-provided data and performance test data to estimate emissions from portable or stationary fuel combustion sources under 98.33(c) and 98.236(z)(2). These changes would create the ability to report a more accurate inventory and incentivize the use of more efficient equipment and controls in the future as this technology is developed and becomes available.

Commenter Name: Timothy A. French
Commenter Affiliation: Truck & Engine Manufacturers Association (EMA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0212-A1
Comment Excerpt Number: 2

Comment Excerpt: The revised GHG Reporting Rule also should recognize and accommodate the improvements that engine manufacturers have developed to reduce exhaust methane emissions, and should not create a disincentive to embrace otherwise available emissions reductions.

Commenter Name: Brian K. Woodard
Commenter Affiliation: Chesapeake Energy Corporation
Commenter Type: Industry
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0216-A1
Comment Excerpt Number: 2
Excerpt Status: Not Started

Comment Excerpt: Additional methane slip reporting methodologies are needed so that excessive uncertainty is not introduced into the reported GHG emissions. Under the proposed methodology, methane slip will become one of the largest methane emissions sources for many reporters. The proposed methodology requires a reporter to apply constant emission factors from a dated technical reference that does not demonstrably characterize the GHG emissions profile from current equipment and emerging technologies. Given the large impact of this methodology update on total emissions magnitude, EPA should more completely assess methane slip emissions quantification methods and revise the proposed regulation so that emissions do not have the potential to be grossly under- or over-counted. In a revised methodology, reporters also need a mechanism to demonstrate emissions reductions so that reported methane slip is representative of actual methane slip where additional data is available. This cannot be achieved with the constant factors as proposed, but it can be achieved by incorporating additional methodologies that already exist. These additional options can be incorporated into GHG reporting, following the precedent where multiple methodologies exist for many other GHG emissions sources. Appropriate methodology options (that should be additional options to the proposed factors) to increase the confidence in reported emissions include obtaining a stack test result that can then be applied to similarly configured engines, emissions certifications from engine manufacturers, and data obtained when implementing new control technologies currently in development. The proposed methodology does not allow reporters to demonstrate existing lower GHG emissions and/or future GHG reductions because any abatement achieved in the field cannot be reflected by an unchanging, rigid emission factor. In addition to introducing significant uncertainty in the reported GHG emissions, this disincentivizes investment in abatement from this emissions source. Adding additional methodologies both increases the representativeness for reporters and retains the emissions reduction incentive.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 2

Comment Excerpt: Additional flexibility is warranted so that operators can reflect technological advancements in the exhaust methane emissions estimate for reciprocating engines. While oxidation catalysts do not effectively reduce methane from lean burn engines, advanced combustion-based technologies can reduce exhaust methane. For example, improved in-cylinder bulk mixing through approaches such as high-pressure fuel injection can reduce emissions of both NOx and methane / products of incomplete combustion. EPA should allow the use of operator vendor-defined EFs, based on measurement data, so that technological advancements that reduce methane are reflected in the annual inventory. If not, the GHGRP will

not incorporate mitigation program results. This is especially important because these emissions could result in imposition of a "methane fee" under the recently passed Inflation Reduction Act. For example, EPA's recent Good Neighbor proposal[8] would require nitrogen oxides (NOx) reductions on thousands of T&S reciprocating engine compressor drivers.[9] Two-stroke lean-burn (2SLB) engines requiring NOx control may install low emissions combustion (LEC) technology that includes high-pressure fuel injection and ignition timing control. In some cases, LEC control may reduce methane emissions. The 2SLB EF in Table W–9 does not accurately reflect methane emissions for such LEC-equipped engines, and those units should be allowed to use an appropriate EF based on company or LEC vendor data. Since these facilities may also be subject to methane fees, this erroneous EF could result in financial penalties for the operator. Thus, it is imperative that EPA provide flexibility to use defensible operator data or vendor data or specifications as an alternative to Table W–9 EFs.

Footnotes

[8] "Proposed Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard," 87 FR 20036, April 6, 2022.

[9] INGAA comments on "Proposed Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard," June 21, 2022.

Commenter Name: Kim White
Commenter Affiliation: EOG Resources, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0235-A1
Comment Excerpt Number: 1

Comment Excerpt: EOG believes that providing for flexibility under the Greenhouse Gas Reporting Rule to use "engineering estimation" including measurement-based methods to develop representative emissions factors will promote innovation and improve accuracy of emissions reporting. The ability in the existing rule to use "engineering estimation" to reflect performance improvement in reported GHG emissions incentivizes companies to develop technologies to detect, measure and ultimately, reduce emissions. EPA should expand rather than restrict this ability to develop representative emissions factors because it will further encourage and incentivize manufacturers and operators to develop newer, cleaner technology and replace older, less efficient equipment.

EPA should specify in § 98.233(z) and Equation W–39B that "engineering estimation" methodologies can continue to be used to calculate combustion slip for natural gas-fired compressor-driver engines.

EOG requests the following changes to the proposed rule.

§ 98.233(z)(1)(ii): "(ii) For fuels listed in paragraph (z)(1)(i) of this section, calculate CO_2, CH_4, and N_2O emissions according to any Tier listed in subpart C of this part, except that natural gas-fired compressor-drivers ~~must~~ can use the appropriate emission factor in Table W–9 for

quantifying CH_4 emissions instead of the CH_4 emission factor in Table C–2 of subpart C of this part or engineering estimation including measurement-based methods. You must follow all applicable calculation requirements for that tier listed in § 98.33, any monitoring or QA/QC requirements listed for that tier in § 98.34, any missing data procedures specified in § 98.35, and any recordkeeping requirements specified in § 98.37. You must report emissions according to paragraph (z)(4) of this section."

§ 98.233(z), Equation W–39B:

$Ea,CH_4=Va*(1-\eta)*YCH_4$

"η = Fraction of gas combusted for portable and stationary equipment determined using engineering estimation. For internal combustion devices that are not compressor-drivers, a default of 0.995 ~~must~~ can be used. For two-stroke lean-burn compressor-drivers, a default of 0.953 ~~must~~ can be used; for four- stroke lean-burn compressor-drivers, a default of 0.962 ~~must~~ can be used; and for four-stroke rich-burn compressor-drivers, a default of 0.997 ~~must~~ can be used."

EOG urges EPA to build in the potential to use these methods. For example, unburned methane entrained in exhaust can be measured during 40 C.F.R. Part 60, Subpart JJJJ emission testing, providing more robust and recent data than the CSU/EI 2019 Study. Studies such as these cited in the proposal do not account for strides that manufacturers and industry have made to reduce and to account for such emissions in recent years. Measurement-based data can be used to compare like units and operation to identify technology, such as fuel conditioning and catalytic performance, for emissions reductions. In addition, under the proposed rule "engineering estimation" methodologies will be allowed for internal combustion sources that are not compressor-driver engines but will not be allowed for natural gas-fired compressor-driver engines. Such a result is inconsistent and is not based on any meaningful distinction between the equipment.

Commenter Name: Kim White
Commenter Affiliation: EOG Resources, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0235-A1
Comment Excerpt Number: 6

Comment Excerpt: Throughout the oil and gas industry, data collection and emissions estimation based on testing and measurement is rapidly evolving. With each passing year, more reliable and accurate data is generated to inform reporting and assist in targeting effective emissions reduction efforts. Considering this quickly evolving landscape, EOG is requesting that EPA provide flexibility to use "engineering estimation" and measurement-based methods in § 98.233(z) and Equation W–39B and as an alternative to the default emissions factors in Tables W–9 and W–1A. Industry should be encouraged to develop and to use measurement-based emission factors in calculating GHG emissions. EOG appreciates the opportunity to provide comments and EPA's consideration of EOG's input.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 15

Comment Excerpt: EPA proposes that all facilities reporting under Subpart W, with the exception of the transmission pipeline industry, include methane slip emissions from compressor engines in their annual Subpart W report. 87 Fed. Reg. at 36984. EPA explains that this proposal is based on Agency analysis showing that there "appears to be combustion slip for all compressor engine types at oil and gas facilities." 87 Fed. Reg. at 36984. EPA states that studies have shown that emissions result from "unburned methane entrained in the exhaust of natural gas compressor engines (also referred to as 'combustion slip' or 'methane slip')."

EPA proposes that reporters use Subpart W-specific emissions factors to calculate methane slip from compressor engines. 87 Fed. Reg. at 36984. But the use of these emissions factors will be less accurate than allowing reporters to record actual test data to estimate emissions or to use monitoring data for the reporting of methane emissions from "combustion slip." Instead, operators should be able to perform periodic stack testing and provide the results of that information to EPA rather than using unreliable emissions factors.

EPA has already recognized that testing of this type of emission is an accurate method of collecting emissions data. For example, Appendix A of Part 60 has proven to yield accurate information for source specific emissions.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 40

Comment Excerpt: EPA is proposing three methane emission factors in Table W–9 (or three combustion efficiencies in Equation W–29) from reciprocating engines that drive compressors: two-stroke lean-burn, four-stroke lean-burn, and four-stroke rich-burn.

GPA does not oppose the proposed emission factors/combustion efficiencies. However, the proposal does not provide an opportunity for reporters to reduce emissions from this source and account for those reductions in their reports. The combustion calculations should allow reporters to use the emission factors in Table W–9 or use OEM (original equipment manufacturer) specific emission factors or use stack test data or apply a percent reduction to the Table W–9 emission factors based on other data. Operators, engine manufacturers, and engine catalyst manufacturers

are rapidly working to develop technologies to minimize methane slip. Allowing use of OEM specific factors, or stack test data, or a control percentage applied to the emissions incentivizes reporters to reduce methane slip, and by extension incentivizes engine and catalyst manufacturers to develop low methane emissions technology for both new and existing engines (with, for example, upgrade kits). EPA must not stifle innovations that are currently under development to reduce methane emitted to the atmosphere. If reporters cannot account for improvements in engine methane emissions, then improvements are much, much less likely to happen. Because this is an area of developing innovation, EPA should allow reporters to use the calculation method that is most representative of emissions, whether that be Table W–9 factors, OEM factors, stack test data, or control percentages applied to Table W–9 factors. With the confluence of possible SEC reporting, methane fees, ESG reporting, responsibly sourced gas certifications, and other driving forces for methane emission reductions, EPA must allow reporters to accurately reflect their emissions using a variety of means to calculate emissions. Especially for significant sources of methane emissions, like engine slip, the time for allowing flexibility in calculations is now, not a future rulemaking. The request also aligns with the directives in the Inflation Reduction Act to pursue reported emissions based on empirical data.

Commenter Name: Douglas Jordan
Commenter Affiliation: Western Midstream Partners, LP
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0202-A1
Comment Excerpt Number: 4

Comment Excerpt: Some of the proposed rule changes we encourage, and support include: The ability to represent emissions based on OEM source specific factors, stack test data, direct measurement, and other quantification methods as an alternative to the use of the proposed emissions factors.

Commenter Name: Timothy A. French
Commenter Affiliation: Truck & Engine Manufacturers Association (EMA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0212-A1
Comment Excerpt Number: 1

Comment Excerpt: EMA's first specific comment relates to the natural gas compressor-driver methane emissions factors that EPA has proposed in Table W–9, set forth at page 87 FR 37105. EMA requests that EPA also allow for use of manufacturer data derived from methane measurement using 40 CFR Part 60 Appendix methods for emissions measurement, as well as CH_4 data derived from the site-testing of engines "within 10 percent of 100 percent peak (or the highest achievable) load," and for certified engines using the 40 CFR part 1065 measurement

method. Further direct field measurement should also be optionally allowed. As noted, EMA's views are aligned with those of the GPA on allowance for manufacturer data or site testing as alternatives to default factors.

Commenter Name: Asa Carre-Burritt, PhD
Commenter Affiliation: Bridger Photonics, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0253-A2
Comment Excerpt Number: 8

Comment Excerpt: In situations where the magnitude of methane entrained in compressor engine exhaust as measured by an advanced technology significantly exceeds the value derived from subpart W calculations, the methane emissions could be reported as fugitive emissions considering that they correspond to abnormal operation.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 13

Comment Excerpt: The proposed method for calculating un-combusted fuel gas from compressor drivers (aka "methane slip") does not allow for the use of empirical data and is wholly based on fuel gas consumption compared to emission factors and heating values mandated by the agency. The mandated factors are much higher for certain types of engines than in the current rule, without adequate justification or explanation.

Many Subpart W reporters currently have compliance obligations under NSPS JJJJ or other regulations, which require emissions performance tests for engines, including compressor driver engines. In many cases, un-combusted methane ("methane slip") can also be measured and quantified during these tests. Yet, under the current EPA proposed GHGRP revisions, reporters would not be allowed to utilize this "empirical data" for determining and reporting their "methane slip" emissions.

AIPRO encourages the agency to allow alternative "methane slip" calculation methodologies based on empirical data, such as engine emissions performance tests (aka "stack tests") and other equivalent alternatives. Failure to do so will have the following effects:

- "Methane slip" emissions will be less accurate and, in many cases, overstated.

- Reporters will be discouraged from implementing technologies such as catalyst systems that significantly reduce real methane slip emissions, because they will not be able to use the real emissions data for GHGRP purposes.
- As a compounding result, reporters may be subject to "waste emissions charges" under the IRA for emissions that are not real. The current proposed method for calculating "methane slip" clearly does not achieve the legislative mandate of the IRA for Subpart W reporting to be based on "empirical data."

Commenter Name: Not provided
Commenter Affiliation: Environmental Data Accuracy Coalition (EDAC)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0227-A1
Comment Excerpt Number: 5
Excerpt Status: Not Started

Comment Excerpt: Use of default factors should be discouraged as individual combustion devices of the same model can have varied air emissions depending on the specific application and operating profile. Air sampling results should be the primary source for methane (and other) emissions factors. Default factors should be considered as a primary source of data only in the absence of actual sampling results or vendor emissions guarantees or bonafide estimates.

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0230-A1
Comment Excerpt Number: 9

Comment Excerpt: Based on the proposed method, methane slip will be one of the largest methane and CO_2e emissions sources in many annual Subpart W reports. The proposed methane slip methodology does not allow reporters to demonstrate GHG reductions because it requires a static emission factor. Reporters need a mechanism to demonstrate emissions reductions so that reported methane slip is representative of actual methane slip. Acceptable additions to the methodology include stack test results that can then be applied to similarly configured engines, potential new control technologies currently in development, and also certifications from engine manufacturers.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance

Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 9

Comment Excerpt: Western Energy Alliance recognizes some changes to the methane emission calculation for combustion engine slip are warranted, however, the Alliance is concerned by the significant increase the proposed revisions represent and the lack of methane estimating technique alternatives. Based on the proposed method, methane slip will be one of the largest methane and CO_2e emissions sources in many annual Subpart W reports. Reporters need a mechanism to demonstrate methane slip emissions reductions so that reported methane slip is representative of actual methane slip. Acceptable additions to the methodology include stack test results that can then be applied to engines where specific technologies are implanted, and certifications from engine manufacturers.

As stated above, there is a heightened focus on and need for accuracy in estimating methane emissions considering third-party certification programs, net zero initiatives, offset programs, the IRA methane emissions fee provisions, and the overall desire for monitored data to match EPA GHGRP inventories more closely. Like EPA's approach for intermittent bleed pneumatics, the Alliance supports the use of equipment specific information where possible for reporting of methane from combustion engines. The Alliance urges EPA to allow for the use of engine-specific data to derive combustion efficiency factors based on measurements, monitoring, manufacturer's specifications, and stack testing as an additional methodology to a single emissions factor approached as proposed. Specifically, EPA needs to allow the use of alternate combustion efficiencies that are based on those testing methodologies. EPA has been directed by the IRA to study and create technology that reduces internal combustion slip emissions. Developing a mechanism to report emissions using combustion efficiencies will improve both the accuracy of the reported information and encourage the development and deployment of efficient settings and equipment for improved understanding and reduction of emissions from engines. Finally, it will incentivize additional monitoring and validation for combustion slip, so long as operators could use the data captured to adjust their GHGRP reporting.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 1

Comment Excerpt: We support the following proposals:

Revising current 40 CFR § 98.233(z)(2)(11) to allow gathering and boosting facilities to use engineering estimates based on best available data to determine the concentration of gas hydrocarbon constituent in the flow of gas to the unit, which would increase flexibility and

accuracy by addressing situations where gas that flows to the unit is not combusted and therefore is not representative of gas that is sent to the unit for combustion.

Commenter Name: William Hittie
Commenter Affiliation: INNIO Waukesha Gas Engines, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0195-A1
Comment Excerpt Number: 8

Comment Excerpt: INNIO Waukesha also supports EPA's proposals on combustion unit aggregation and reporting of compressor-driver design class, as both revisions facilitate incorporation of the proposed methane emission factors and combustion efficiency values.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 41
Excerpt Status: Not Started

Comment Excerpt: EPA is clarifying that emissions may be calculated in 40 C.F.R. § 98.233(z)(3)(ii) for groups of combustion units. However, if any of the combustion units downstream of this shared measurement point are natural gas-driven compressor drivers, the volumes of fuel for those units would have to be separated from the total before emissions are calculated to account for the differences in combustion efficiency.

EPA should allow grouping of natural gas-driven compressor driver engines if they are of the same class. First, at a G&B station, most fuel combustion equipment are compressor drivers, with possibly one or two small heaters. Second, it takes considerable work to apportion fuel use to each piece of equipment. One must use actual station fuel use, individual equipment heat rate, and individual equipment actual run hours to properly apportion fuel use, and the calculations accordingly must be performed using a mix of station-wide operating data (fuel use), equipment properties (heat rate), and equipment operating data (run hours). This is difficult to automate. However, if a station consists of, for example, three 4 stroke-rich burn engines, and a heater less than 5 MMbtu/hr, the reporter should be able to simply use the station fuel use and the 4-stroke rich-burn methane emission factor and combustion efficiency. This would dramatically reduce burden and provide the same emissions data.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 70

Comment Excerpt: EPA should require LNG Import/Export facilities to continuously monitor engine emissions. Stationary fuel combustion can be a major source of greenhouse gas emissions at LNG import and export facilities as they are used to supplement power and energy to the facility by combusting the biol-off gas produced from on-site storage tanks. During combustion of natural gas, methane is emitted in significant quantities due to fugitive leaks from the equipment and incomplete combustion. We strongly urge EPA to require continuous emissions monitoring for methane emissions in the exhaust of stationary fuel combustion equipment, as currently required for CO_2 in all LNG facilities to accurately account for fugitive methane leaks.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 46

Comment Excerpt: Stationary fuel combustion can be a major source of GHG emissions at LNG import and export facilities as they are used to supplement power and energy to the facility by combusting the boil off gas produced from on-site storage tanks. During combustion of natural gas, methane is emitted in significant quantities due to fugitive leaks from the equipment and incomplete combustion. A survey by Marcogaz, a European natural gas technical association, estimated average emissions from LNG import terminals to be 165 grams of methane/metric ton of LNG with unburned methane in the exhaust gases from gas turbines, gas engines and combustion equipment and flares contributing to 5% of the total methane emissions.[84] The report also found that 83% were fugitive methane emissions from compressors and high-pressure areas of the terminal.

We strongly urge EPA to require continuous emissions monitoring for methane emissions in the exhaust of stationary fuel combustion equipment, as currently required for CO_2, in all LNG facilities to accurately account for fugitive methane leaks.

Footnotes

[84] Marcogaz, Survey Methane Emissions for LNG Terminals in Europe (2018), https://www.marcogaz.org/wp1content/uploads/2021/04/WG-ME-17-22.pdf

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Commenter Name: Tamara S. Maddox
Commenter Affiliation: Alaska Oil & Gas Association (AOGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0214-A1
Comment Excerpt Number: 5

Comment Excerpt: EPA should define "pipeline quality gas" for 40 C.F.R. 98.233(z). Combustion emission units located within the Onshore Petroleum and Natural Gas Production and Onshore Petroleum and Natural Gas Gathering and Boosting sectors have the potential to use the 40 C.F.R. 98 Subpart C combustion calculation methodology if the fuel used meets certain criteria. The criteria are as follows from proposed 40 CFR 98.233(z)(1):

If a fuel combusted in the stationary or portable equipment meets the specifications of paragraph (z)(1)(i) of this section, then calculate emissions according to paragraph (z)(1)(ii) of this section.

(i) The fuel combusted in the stationary or portable equipment is listed in Table C–1 of subpart C of this part or is a blend in which all fuels are listed in Table C–1. If the fuel is natural gas or the blend contains natural gas, the natural gas must also meet the criteria paragraphs (z)(1)(i)(A) and (B) of this section.

(A) the natural gas must be of pipeline quality specification. (B) the natural gas must have a minimum higher heating value of 950 Btu per standard cubic foot.[5]

The first criterion (A) is that the natural gas must be of "pipeline quality specification." There is currently no definition of "pipeline quality specification" within Subpart W or Subpart A of Part 98. It makes sense that if being of "pipeline quality specification" is a requirement, then it necessarily must have a definition.

AOGA proposes EPA adopt the following definition for "Pipeline Quality Natural Gas":

Pipeline Quality Natural Gas means a naturally occurring mixture or process derivative of hydrocarbon and non-hydrocarbon gases found in geologic formations beneath the earth's surface, of which its constituents include, but are not limited to, methane, heavier hydrocarbons and carbon dioxide, and which is provided by a supplier through a pipeline. Pipeline quality natural gas must either be composed of at least 70 percent methane by volume or have a gross calorific value between 950 and 1100 Btu per standard cubic foot.

This definition is based on the existing definitions of "Natural Gas" from 40 C.F.R. 98.238 and "Pipeline Natural Gas" from 40 C.F.R. 72.2, regulations which were developed for the Acid Rain Program.

The 40 C.F.R. 72.2 definition of "pipeline natural gas" is a long-standing definition within air regulations and a logical reference for these purposes. Adopting this definition would also obviate the need for the fuel specification criterion in proposed 40 C.F.R. 98.233(z)(2)(i). If a gas does not meet the specifications of pipeline quality natural gas, then it is necessarily field gas, and the operator would continue to calculate combustion emissions according to subpart W methodology.

Footnotes

[5] Proposed 40 C.F.R. 98.233(z)(1)(i)(A) and (B).

A-17. Comments re: proposed revisions to calculation, monitoring, recordkeeping or reporting for leak detection and measurement methods

Commenter Name: Not provided
Commenter Affiliation: Sensors, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0178
Comment Excerpt Number: 2

Comment Excerpt: As a manufacturer of gas emissions measurement systems (including High Flow Samplers for fugitive methane emissions quantification), the focus of our comments is directed specifically to the suggested revisions to the high-volume sampler methods aimed at improving the efficacy and quality of the data arisen from field-based leak quantification measurements. First, we agree on the importance of quantifiable, measured fugitive methane flows. It is well known that methane is a powerful greenhouse gas, 25-30 times more potent than CO_2, and responsible for about one third of current climate warming. Methane is also a gas that may be subject to measurement-based interferences from other gases present in natural gas (*e.g.*, ethane and propane) which are likely to lead to erroneous quantification estimates. These errors can be mitigated by employing systems that allow for the accurate quantification of fugitive methane and moreover, are shown to meet standard metrological performance-based tests.

Second, EPA notes that systems exist that are capable of measurements exceeding 10 to 11 CFM and maximum methane quantification limits of 6 to 8 CFM of 70% of the maximum sampling rate. We know systems exist that are, in fact, capable of measurements approaching 25 CFM which would allow for three times the current suggested levels, or 17 to 18 CFM. These systems also possess the ability to measure very small leaks (as small as 0.0005 CFM) important for the program to clean up abandoned and orphan wells. This capability permits the accurate measurement of leaks from a wider range of sources.

Finally, it is critical that any protocol provides for specifications that enhance the accuracy and traceability of the data. We suggest that traditional metrological guidelines for accuracy, drift, repeatability, interference be established to assure system performance. Data, including calibration data, should be recorded, and stored in a manner that guarantees security and an historical record of events.

A-18. Comments re: proposed revisions to reporting for the Onshore Petroleum and Natural Gas Gathering and Boosting Compressor Stations

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 16

Comment Excerpt: We request that EPA revise the requirement to report the count of compressor stations for facilities in the Onshore Petroleum and Natural Gas Gathering and Boosting industry segment (98.236(aa)(10)(v)) to a count of gathering and boosting stations. Using the term "compressor station" will limit EPA's data collection effort to only those sites reported under the Gathering and Boosting industry segment that meet the definition of "compressor station"; therefore, leaving out a number of other facility types. We would also request that a definition of gathering and boosting station be added that includes booster stations, compressor stations, dehydration facilities, treating facilities, and gathering facilities.

Finally, with regard to upstream oil and gas production operations such as centralized production facilities which do not have a producing well on site, but are otherwise operated the same as onshore oil and gas production sites with no compressor stations or midstream operations under the control of the operator subject to reporting, we request that operators be allowed to report information for those operations under onshore oil and gas production instead of having to split them out into separate reports under gathering and boosting simply because there is not a producing well on the site. This would eliminate unnecessary data processing, calculations, and additional facilities in reporting.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 42

Comment Excerpt: A significant data gap current exists in reporting for the G&B segment. Companies report emissions and activity data by facility, which for this segment is defined as the entire basin. However, companies are not currently required to report the total number of gathering and boosting stations in each basin facility. This piece of activity data would greatly improve stakeholder ability to understand reported emissions. And, it is less burdensome than the current requirement in the Production segment to report the number of wells in each basin facility. Thus, we recommend that EPA add this critically important data element to the reporting requirements for companies in the G&B segment.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 29

Comment Excerpt: EPA is proposing to add, as reporting element, the count of compressor stations within a basin to facilitate better understanding of G&B operations [98.236(aa)(10)(v)], at the request of GPA Midstream.

GPA thanks EPA for making this kind of change, as we think a change of this nature will add value when analyzing data from a G&B basin. However, recently GPA has found that limiting this count to compressor stations only does not adequately meet the intent of collecting this particular data element, which is to provide a way to "spread" the data reported across the number of facilities in the basin, so that it can be viewed and interpreted in light of a more traditional definition of "facilities." GPA therefore suggests revising the rule to require additional information, which will provide a more complete understanding of typical equipment counts at gathering and boosting assets.

In addition to collecting information on the number of gathering and boosting stations in a basin, GPA also encourages EPA to acquire additional information related to other key differences in the basins. For example, gathering systems that operate with low suction pressure will require more compression to move gas (sometimes twice as much compression), and this type of information may provide insight into differences in emissions between operators and/or basins. Suggested text: "98.236(aa)(10)(vi) Average gathering and booster station inlet pressure."

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 45

Comment Excerpt: Reporting element 98.236(aa)(10)(ii)—"The quantity of gas transported to a natural gas processing facility, a natural gas transmission pipeline, a natural gas distribution pipeline, or another gathering and boosting facility in the calendar year, in thousand standard cubic feet" — is collected to assess basin throughput. However, this throughput metric only captures gas at the boundaries of a G&B basin and does not adequately capture gas movement within a basin. For example, it is not uncommon for gas to travel through multiple compressor stations in series on its way to a gas plant. However, with the current throughput definition, this gas movement is only captured once — at the gas plant. Just as understanding the number of gathering and booster stations in a basin is critical for data analysis, understanding gas flow through gathering and boosting stations as it truly moves within a basin is critical. We suggest that EPA include in this data element any gas volume that moves through a gathering and boosting station that is not otherwise captured by the existing definition.

Suggested text: 98.236 (aa)(10)(ii) The quantity of gas transported to a natural gas processing facility, a natural gas transmission pipeline, a natural gas distribution pipeline, or another gathering and boosting facility in the calendar year, in thousand standard cubic feet. **This quantity should also include volume transported from one gathering and boosting station**

to another gathering and boosting station within the basin that is not otherwise accounted for.

Commenter Name: Tamara S. Maddox
Commenter Affiliation: Alaska Oil & Gas Association (AOGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0214-A1
Comment Excerpt Number: 6

Comment Excerpt: EPA should revise the definition for "centralized oil production site." EPA has determined that there is a group of sources that may not fit into the existing segment definitions, and therefore is proposing a new definition of "centralized oil production site" which would ultimately be part of the Onshore Petroleum and Natural Gas Gathering and Boosting segment. The proposed definition lacks clarity and could lead to internal inconsistencies in the rule.

AOGA requests the EPA amend the definition of "centralized oil production site" in 40 C.F.R. 98.238 as follows:

Centralized oil production site means any permanent combination of one or more hydrocarbon produced liquids storage tanks located on one or more contiguous or adjacent properties that does not also contain a permanent combination of one or more compressors that are part of the onshore petroleum and natural gas gathering and boosting facility that gathers hydrocarbon liquids from multiple well-pads. Process tanks are not considered storage tanks.

Inserting the word "produced" in between "hydrocarbon liquids" ensures there is consistency with the language used in 40 C.F.R. 98.233(j)—the calculation methodology for storage tanks within the Onshore Petroleum and Natural Gas Gathering and Boosting segment (emphasis added below):

*Calculate CH_4, CO_2, and N_2O (when flared) emissions from atmospheric pressure fixed roof storage tanks receiving hydrocarbon **produced** liquids from onshore petroleum and natural gas production facilities and onshore petroleum and natural gas gathering and boosting facilities (including stationary liquid storage not owned or operated by the reporter), as specified in this paragraph (j).*

Please note that 40 C.F.R. 98.236(j), data reporting requirements for Onshore Production and Onshore Petroleum and Natural Gas Gathering and Boosting storage tanks, also consistently references "produced oil." Maintaining the word "produced" in conjunction with "storage tank" in this context preserves the intent behind these regulations to report greenhouse gas emissions from hydrocarbon produced liquids.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 30
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: The definition of "Centralized Oil Production Site" should be further revised to explicitly exclude centralized production tank batteries and "tankless" facilities. Newer facility designs often exclude hydrocarbon liquid storage tanks, employing separators operating at near atmospheric pressures with control devices. These control devices include flares during upsets and vapor recovery units. Both oil and water are pipelined directly from these vessels. EPA should revise the proposed definition of "Centralized Oil Production Site" to "any permanent combination of one or more hydrocarbon liquids storage tanks that collect liquid hydrocarbons from multiple well pads or separation facilities but that do not have compressors (*i.e.*, are not "compressor stations")."

Commenter Name: Tamara S. Maddox
Commenter Affiliation: Alaska Oil & Gas Association (AOGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0214-A1
Comment Excerpt Number: 7

Comment Excerpt: AOGA also requests EPA add to the definition of "centralized oil production site" that "process tanks are not considered storage tanks." With this request, it necessitates a definition of "process tank" as Subpart W and Subpart A currently do not contain this definition. AOGA proposes the following definition:

Process Tank means a tank that is used within a process (including a solvent or raw material recovery process) to collect material discharged from a feedstock storage vessel or equipment within the process before the material is transferred to other equipment within the process, to a product or by-product storage vessel, or to a vessel used to store recovered solvent or raw material. In many process tanks, unit operations such as reactions and blending are conducted. Other process tanks, such as surge control vessels and bottoms receivers, however, may not involve unit operations.

This proposed definition is taken directly from NSPS Subpart Kb (40 C.F.R. 60.111b). Including this definition adds clarity to the proposed definition of "centralized oil production site" as there may be other processes at that location, while remaining consistent with other similar storage tank/vessel rules in EPA regulations.

A-19. Comments re: proposed revisions to throughput reporting for the Onshore Natural Gas Processing and Natural Gas Distribution Segments

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 3

Comment Excerpt: We support the following proposals: Revising 40 CFR § 98.236(aa)(3) in order to eliminate reporting redundancies for natural gas processing plants in Subpart W and Subpart NN.

A-20. Comments re: proposed revisions to the definition of the Onshore Natural Gas Processing Industry Segment

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 11

Comment Excerpt: EPA proposes to revise the definition of the Onshore Natural Gas Processing segment to largely align with OOOOa and to remove the 25 MMscf per day threshold for facilities that do not fractionate NGLs.

GPA does not anticipate the proposed changes will impact reported emissions significantly. The proposed changes better categorize facilities to align with industry terminology, which will also better align reported emissions with the appropriate industry segments. For the reasons EPA articulated in the preamble, these changes also add certainty for reporters and reduce burden.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 4

Comment Excerpt: We support the following proposals:

Clarifying the definition of the Onshore Natural Gas Processing segment and removing the throughput threshold in the definition, to remove the uncertainty that currently exists as to

whether a processing plant must report under the Onshore Natural Gas Processing facility rules or the Onshore Petroleum and Natural Gas Gathering and Boosting facility rules.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 2

Comment Excerpt: Williams is also supportive of the proposed revision to the definition of processing plant that will exclude the 25 MMscf/d minimum throughput threshold. This revision will add consistency in reporting for treatment and forced extraction facilities with throughputs less than 25 MMscf/d that were historically categorized as gathering compressor stations simply because of their throughput.

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 12

Comment Excerpt: Streamlining and Improving Implementation of Subpart W

For Onshore Natural Gas Processing, EPA has requested comment on whether or not the existing requirement to include residue gas compression equipment owned or operated by the natural gas processing facility should be removed. It makes more sense to our members to not remove the existing requirement. Removing the requirement would result in increased recordkeeping with no clear value gain.

PBPA opposes EPA's proposal to replace the definition of "Onshore Natural Gas Processing." The proposed language will only complicate reporting and does not improve transparency.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 12

Comment Excerpt: EPA should absolutely retain the existing language in 40 CFR § 98.230(a)(3) and 40 CFR § 98.231(b). Residue gas compression equipment owned or operated by the natural gas processing facility is permitted under the natural gas processing facility in state and federal permits and is considered part of the natural gas processing facility under OOOOa (see TSD, Proposed 40 C.F.R. 60 subpart OOOOa, page 73), where EPA, when describing Natural Gas transmission and storage stations says, "Residue (sales) gas compression operated by natural gas processing facilities are included in the onshore natural gas processing segment and are excluded from this segment." See also 40 C.F.R. § 60.5365a which clarifies that OOOOa applies to an affected facility located with the Crude Oil and Natural Gas Production source category, as defined in 40 C.F.R. § 60.5430a, which defines the Crude Oil and Natural Gas Production source category to mean "Natural gas production and processing, which includes the well and extends to, but does not include, the point of custody transfer to the natural gas transmission and storage segment." Residue compressors at a gas plant are clearly upstream of the point of custody transfer to the natural gas transmission and storage segment. Further, there is no reason for EPA to create unnecessary confusion by redrawing the commonly understood boundaries of these industry segments. Doing so would be a mistake and could have considerable unforeseen consequences. Additionally, removing this language, as contemplated by EPA's proposal, would likely decrease reported emissions, as emissions reported at processing plants would decrease, and a handful of plant residue compressors which would be considered "transmission compression" may not trigger the 25,000 $mtCO_2e$ reporting threshold for Onshore Natural Gas Transmission Compression.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 63

Comment Excerpt: EPA has proposed updates to the definition of the Onshore Natural Gas Processing industry segment to clarify that this segment is not required to report emissions from storage tanks. We do not support this and believe EPA should require reporting from storage tanks in this segment. During helicopter-based OGI flights conducted in 2021, EDF documented 30 emission counts from storage tanks at processing plants in the Permian Basin.[139] We also documented another dramatic tank emissions from a processing plant in Eunice, New Mexico in 2022. [140] We believe this to be a significant source of methane emissions and recommend adding reporting requirements for storage tanks in the Onshore Natural Gas Processing industry segment.

Footnotes

[139] See Attachment B - LSI Tank Emissions from Processing Plants.

[140] See NM_ 162 IR (video on file with EDF).

Commenter Name: Ron Ness
Commenter Affiliation: North Dakota Petroleum Council (NDPC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0225-A1
Comment Excerpt Number: 2

Comment Excerpt: One clarification we feel necessary to outline is ensuring the oil and natural gas source category and its segments are clearly defined, especially the processing segment. In the NSPS OOOOa Background Technical Support Document (TSD), the EPA states: "The final rule covers emission sources within the oil and natural gas source category, which includes onshore crude oil production and natural gas production, processing, transmission and storage."

These are discreet segments that the EPA discusses and defines in the TSD. The production segment includes everything from the wellhead through the gathering system and ends at the refinery or natural gas processing plant. The EPA describes oil refining and natural gas processing as: "The oil refinery sector is considered separately from the oil and natural gas sector. Therefore, at the point of custody transfer at the refinery, the oil leaves the oil and natural gas sector and enters the petroleum refining sector." The EPA states further: "Natural gas processing consists of separating certain hydrocarbons and fluids from the natural gas to produce 'pipeline quality' dry natural gas. While some of the processing can be accomplished in the production segment, the complete processing of natural gas takes place in the natural gas processing segment." At this point, the pipeline quality natural gas leaves the processing segment and enters the transmission and storage segment.

We therefore respectfully request the EPA to clarify that, while some processing of natural gas can occur in either the production or processing segment, a natural gas processing plant can only exist in the processing segment, beginning at the end of the gathering system and ending when pipeline quality natural gas is delivered into the transmission and storage segment.

A-21. Comments re: other minor revisions or clarifications

Commenter Name: Charles E. Venditti
Commenter Affiliation: Countrymark Energy Resources, LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0181-A1
Comment Excerpt Number: 4

Comment Excerpt: Are the definitions consistent between Subpart W, OOOOa, OOOOb, and OOOOc? As we read through the proposed regulation, we would like to encourage EPA to review other regulations to ensure consistency in the definitions between each of the subsections.

Commenter Name: Ryan Watts
Commenter Affiliation: Kentucky Oil and Gas Association (KOGA)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0182-A1
Comment Excerpt Number: 9

Comment Excerpt: Are the definitions consistent between Subpart W, OOOOa, OOOOb, and OOOOc? As we read through the proposed regulation, we want to challenge EPA to maintain consistency in the definitions between each of the subsections of the regulations.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 19

Comment Excerpt: On September 23, 2022, AGA filed a petition for administrative reconsideration of the recently promulgated definition of "transmission line" in a final rule published by the DOT PHMSA on August 24, 2022. [34] The new PHMSA Final Rule revised the definition of "transmission line" in 49 C.F.R. 192.3, which is the basis for EPA's Subpart W definitions pertaining to gas distribution. AGA's petition, attached as Appendix A hereto, explains that by adding the phrase "or connected series of pipelines" to the definition of "transmission line," PHMSA has made the definition void for vagueness under the Due Process Clause of the U.S. Constitution,[35] because a reasonable operator or owner will be unable to determine the scope of its pipeline facilities that are subject to the regulatory requirements for transmission under the Pipeline Safety Act, which carries potential criminal sanctions for violations. If PHMSA does not remove this phrase upon reconsideration, its definition of "transmission line" will in turn render EPA's definition of gas "distribution pipeline" void for vagueness due to its reliance on PHMSA's definitions. EPA defines "distribution pipeline" in 40 C.F.R. 98.238 to mean "a pipeline that is designated as such by the Pipeline and Hazardous Material Safety Administration (PHMSA) 49 CFR 192.3." PHMSA defines "distribution line" to mean "a pipeline other than a gathering or transmission line." (emphasis added). The PHMSA Final Rule injected ambiguity by adding the phrase "or connected series of pipelines" to the definition:

"Transmission line means a pipeline or connected series of pipelines, other than a gathering line, that: (1) Transports gas from a gathering line or storage facility to a distribution center, storage facility, or large volume customer that is not down-stream from a distribution center; (2) operates at a hoop stress of 20 percent or more of SMYS; or (3) transports gas within a storage field. Note: A large volume customer may receive similar volumes of gas as a distribution center, and includes factories, power plants, and institutional users of gas."[36]

For the reasons given in AGA's Petition for Reconsideration of the PHMSA Final Rule, PHMSA's addition of the phrase "or connected series of pipelines" in the definition of "transmission line" makes it impossible to determine where the demarcation point exists between transmission and distribution line assets. If PHMSA does not remove this phrase, EPA will need to clarify its own definition of "distribution pipeline" in 40 C.F.R. 192.3 to prevent its definition from becoming void for vagueness as well as arbitrary and capricious. The simpler solution will be for PHMSA to remove the phrase from its definition. The Associations urge EPA to encourage PHMSA to do so.

Footnotes

[34] Pipeline Safety: Safety of Gas Transmission Pipelines: Repair Criteria, Integrity Management Improvements, Cathodic Protection, Management of Change, and Other Related Amendments, 87 Fed. Reg. 52224 (Aug 24. 2022) (hereinafter PHMSA Final Rule). Commenter submitted a copy of the petition as Appendix A.

[35] The vagueness doctrine requires fair notice of what conduct is subject to criminal penalties. See, *e.g.*, Johnson v. United States, 495 U.S. 575 (2015) (definition of "violent felony" included a residual clause that gave insufficient notice of the consequences of an action); Sessions v. Dimaya, 138 S. St. 1204 (2017) (straightforward application of Johnson rendered a residual clause's ill-defined risk threshold unconstitutionally vague).

[36] Id, (emphasis added).

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 16

Comment Excerpt: EPA Should Clarify the Definition of "Distribution Pipeline" if PHMSA Fails to Clarify Its Newly Revised Definition of "Transmission" Pipeline. In a petition for reconsideration (filed September 23, 2022) pertaining to the recently promulgated definition of "transmission" pipeline published by the Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) in 49 C.F.R. 192.3, the American Gas Association notes a number of practical and legal problems related to the addition of the phrase "or connected series of pipelines" to the definition of transmission pipeline. If PHMSA does not remove this phrase, its definition of transmission pipeline would in turn render EPA's definition of natural gas "distribution" pipeline similarly problematic on legal and practical grounds, due to EPA's reliance on PHMSA's definitions, giving rise to the concern that the definition may violate the Administrative Procedure Act or may be otherwise unlawful. EPA should urge PHMSA to remove the phrase. If PHMSA does not do so, EPA will need to clarify its definition of distribution to eliminate this source of ambiguity and confusion related to determining which pressure regulating stations are Transmission to Distribution (T-D) stations subject to annual surveys, among other Subpart W requirements for distribution.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 14

Comment Excerpt: The flowback equations are unchanged by the proposed rule, but they include a known issue that misrepresents emissions during the initial flowback period. The initial period is flowing back water with insufficient pressure to operate a separator. The equation for flowback requires a linear interpolation of emissions over the entire duration, but this is not supported by field data or emissions studies around flowback. For example, LEL meters around flowback equipment do not show the presence of emissions during this initial period, and instead generally show emissions after a significant amount of time, if at all. For many companies complying with OOOO, the majority of reported flowback GHG emissions are from this initial term and are emissions on paper only, and therefore there is no possible solution to reduce emissions. The Subpart W equations also create an inconsistency between Subpart W and OOOOa annual reports, which a reporter cannot remedy while still being compliant with both regulations. A very straightforward solution is to remove this initial term which is also much more consistent with OOOOa reports.

A-22. Comments re: best available monitoring methods

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 6

Comment Excerpt: GPA does not believe that an effective date of January 1, 2023, is realistic or workable. For that reason, GPA encourages EPA to adopt an effective date of January 1, 2024, and to provide for automatic availability of BAMM for RY2024. If EPA adheres to its plans for a January 1, 2023 effective date, GPA requests that EPA make BAMM automatically available for RY2023 and RY2024. As explained above, the changes to the GHGRP that EPA has proposed are extensive and will require substantial modifications to data collection and reporting systems. As described below, those changes cannot be made until EPA finalizes updated reporting forms and schema. Regardless of the effective date, GPA does not believe that its members will be able to complete the necessary changes to their systems prior to the end of 2024. Further, completion of the necessary changes and ensuring that the systems are operating correctly may take longer than EPA has initially estimated. Accordingly, GPA requests that EPA provide for optional BAMM in 2025. EPA could require that reporters making a request for BAMM for RY2025 certify that additional time is needed to install necessary monitoring equipment or to otherwise upgrade systems to ensure accurate reporting. Such an approach would be consistent with EPA's goals for the GHGRP, the Agency's past and current policies regarding BAMM, and would

allow the regulated community to work with EPA to provide the information the agency hopes to receive.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 15

Comment Excerpt: INGAA members appreciate EPA's recognition that affected facilities might not have all of the equipment, systems, and QA/QC procedures in place to support the monitoring requirements in the Proposed Rule beginning on the proposed effective date of January 1, 2023. For that reason, the Proposed Rule is allowing the use of best available monitoring methods from January 1, 2023, to December 31, 2023. However, EPA is requiring that the calculation methodologies and equations set forth in the Proposed Rule be used if best available monitoring methods are used. Further, the Proposed Rule references 40 CFR subparts OOOOb and OOOOc and 40 CFR part 60 Appendix K, which are yet to be promulgated.

INGAA members, as do others affected by the proposed regulations, use a variety of systems to collect, compile, reduce, and report GHGRP data. Modifying the configurations of environmental reporting systems requires the effort of specialized personnel working with the technical end users. The process requires programming development, user testing, user acceptance testing, then validation before it is successfully used. The industry will need, at a minimum, several months to modify and update these data collection and reporting systems and verify that updates yield accurate data. To update these systems effectively and efficiently, INGAA members need to understand the requirements of 40 CFR subparts OOOOb and OOOOc and 40 CFR part 60 Appendix K. The effort required to modify and verify the accuracy of GHGRP reporting systems is dependent upon finalization of these rules. Given the uncertainty surrounding the release of final versions of these proposed rules, INGAA recommends that EPA establish an effective date of January 1 of the year following promulgation of all related regulations, provided that facilities have at least six months to develop, implement, and verify the accuracy of new data collection, reduction, and reporting systems.

Given the breadth of factors affecting GHG reporting, INGAA also recommends that EPA allow affected facilities two years for automatic BAMM with the option to request BAMM for specific items for a third year. This will enable affected facilities to properly implement and verify the monitoring methods that are affected by proposed revisions to the GHGRP, 40 CFR subparts OOOOb, OOOOc, and 40 CFR part 60 Appendix K.

A-23. Comments re: Inflation Reduction Act

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry

Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 16

Comment Excerpt: The Proposed Rule compliance date of January 1, 2023, is not reasonable, and the timing of the IRA mandate requiring EPA Subpart W reporting to be based on empirical data may impact the final rule.

In August 2022, President Biden signed into law the IRA, which mandates: Not later than 2 years after the date of enactment of this section, the Administrator shall revise the requirements of subpart W of part 98 of title 40, Code of Federal Regulations, to ensure the reporting under such subpart, and calculation of charges under subsections (e) and (f) of this section, are based on empirical data, including data collected pursuant to subsection (a)(4), accurately reflect the total methane emissions and waste emissions from the applicable facilities, and allow owners and operators of applicable facilities to submit empirical emissions data, in a manner to be prescribed by the Administrator, to demonstrate the extent to which a charge under subsection (c) is owed.[17]

Duke Energy urges EPA to consider pausing a determination on the final rule for the proposed revisions to the greenhouse gas reporting rules for natural gas facilities under Subpart W until such time that the rule can be revised to include provisions for the IRA mandate for empirical data and to provide suitable time for companies to prepare for compliance to the new reporting rules.

Footnotes

[17] Inflation Reduction Act Sec. 60113, Methane Emissions Reduction Program; adding Clean Air Act § 136(h), Reporting (emphasis added).

Commenter Name: Ben Shepperd
Commenter Affiliation: Permian Basin Petroleum Association (PBPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0188-A1
Comment Excerpt Number: 14

Comment Excerpt: As the EPA is aware there are numerous other Federal actions either underway or recently taken that rely on or reference the provisions of the GHGRP. To our members' knowledge, these include the recent Inflation Reduction Act ("IRA"), the EPA's ongoing rulemaking on OOOOb/c, and the Securities and Exchange Commission's ("SEC") development of the Enhancement and Standardization of Climate-Related Disclosures for Investors, File No. S7-10-22, ("Disclosure Rule"). The EPA should take great care in understanding the interaction between such legislation, other proposed rules and the agency's proposed revisions to the GHGRP. 'These revisions will have consequences on those other actions and vice versa. If those consequences result in confusion, inaccuracies in reporting, or a lack in quality of reported data, EPA's stated intent for revisions to the GHGRP will not be

achieved. Therefore, if EPA chooses to take no time to reconcile contradictions or inaccuracies between the proposed GHGRP revisions and other proposed rulemakings, it is highly likely additional proposed revisions will be needed sooner rather than later. Further, if the multiple different rulemakings are not reconciled, we recommend EPA not reference those other rule makings, (*e.g.* references to OOOOb/c) in the GHGRP revisions since the other proposed rulemakings are still undergoing rulemaking and commenting themselves.

PBPA encourages collaboration between the EPA and SEC in the development of its Disclosure Rule in order to increase transparency and limit unforeseen complications and negative consequences. If the intent of the EPA's proposed revisions to the GHGRP truly is to provide consistency and clarity in reporting, it should be clarified how changes to GHGRP will impact the history of reporting required under the Disclosure Rule. PBPA also encourages the EPA to fully understand the needs and impacts of the IRA with regards to the GHGRP. If the passage of the IRA necessitates additional changes to the current proposed revisions to the GHGRP, EPA should take the necessary time to understand and incorporate those changes, also allowing the proper time for public review of these additional changes, as opposed to finalizing these revisions and subsequently offering up additional revisions in the not too distant future. For instance, under the current GHGRP, there are several emission factors and data points that do not allow for the flexibility needed to accurately reflect the in-field differences from operator to operator and basin to basin. If an emissions tax or fee system as required under IRA is implemented utilizing GHGRP, additional flexibility will need to be provided to truly support quality and consistency in reporting. Studies have shown that similar equipment and production can result in different emission amounts, because of differences in facility design, operation, and maintenance.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 1
Excerpt Status: Not Started

Comment Excerpt: The Inflation Reduction Act requires EPA to, within the next two years, revise subpart W to support methane fee implementation and allow reporters to submit empirical data... As such, GPA suggests that EPA not change subpart W at this time and instead issue one comprehensive subpart W rule package to accomplish the goals of this proposal along with methane fee implementation. This will reduce reporter burden by avoiding the "whiplash" of making changes for one expansive subpart W rulemaking only to make another set of changes in short order. Not only do we support this for resource efficiency, but GPA also supports the use of direct measurement and testing as an option, alongside the option to use emission factors derived from empirical data.

Commenter Name: Curtis J. Winner
Commenter Affiliation: New Mexico Gas Company (NMGC)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0203-A1
Comment Excerpt Number: 1

Comment Excerpt: NMGC recommends postponing finalization of the Subpart W portion of the Proposed Rule: EPA should instead develop a single Subpart W rulemaking that incorporates changes to implement the new methane fee as Congress required in the Inflation Reduction Act ("IRA").

The Inflation Reduction Act (IRA) mandates EPA to impose and collect a charge on methane emissions from the petroleum and natural gas sector. Congress determined that relevant aspects of the program, including which facilities and how to calculate methane, will be based on the EPA Greenhouse Gas Reporting Program (GHGRP) Subpart W. Therefore, EPA will be required to revise Subpart W within 2 years. If EPA postpones the current proposed rulemaking, changes to Subpart W will be best aligned with the IRA requirements and reduce the burden on both industry and EPA.

Regarding any proposed changes to the GHGRP, NMGC advocates for improved data quality and quantification, including options for direct measurement, which aligns with Congress's goal of utilizing empirical data. Working through these (often highly complicated) issues in the context of a new rulemaking will provide EPA, regulated stakeholders, and the public at-large the needed time and proper regulatory vehicle to make a single, comprehensive update to GHGRP Subpart W.

Commenter Name: Not provided
Commenter Affiliation: Exelon
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0209-A1
Comment Excerpt Number: 3
Excerpt Status: Not Started

Comment Excerpt: It appears that EPA may amend Subpart W emissions calculations, methodology or emissions factors as a result of the Inflation Reduction Act's requirement for the EPA to revise Subpart W by August of 2024 (42 U.S.C. § 7436). EPA should wait to finalize the related elements of the Proposed Rule until it can package them with amendments designed to implement the Inflation Reduction Act to avoid disruption to processes and unnecessary costs associated with changes to complying with new reporting requirements.

Commenter Name: Amy D. Kapuga
Commenter Affiliation: Consumers Energy Company
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0221-A1
Comment Excerpt Number: 1

Comment Excerpt: Substantially, given the clear direction from Congress in the Inflation Reduction Act (IRA), EPA should postpone finalizing the portion of the Proposed Rule related to Subpart W. Postponement will allow EPA to develop a single Subpart W rulemaking that incorporates changes needed to comply with the Congressional mandate. This later rulemaking can include new requirements that respond directly to the IRA, as well as portions of the Proposed Rule related to Subpart W that EPA deems to be of continued relevance and importance to the program. A single rulemaking will reduce the burden on both industry and the Agency.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 24

Comment Excerpt: On August 16, 2022, President Biden signed into law the Inflation Reduction Act (IRA).° The IRA mandates the EPA impose and collect a charge on methane emissions from the petroleum and natural gas sector where methane emissions from an applicable facility exceed a pre-determined waste emissions threshold.° The fee starts at $900 per metric ton of methane in calendar year 2024, increasing to $1,200 in 2025, and then tapering off at $1,500 in 2026 and later years. Congress determined that relevant aspects of the program, including which facilities are subject to the charge and how to calculate the amount of methane subject to the charge, will be based on EPA's Greenhouse Gas Reporting Program (GHGRP) Subpart W.

To implement the methane charge program, Congress mandated EPA to revise Subpart W within two years (by August 16, 2024) to ensure that reporting and calculation of the methane charge are based on empirical data, accurately reflect the total methane emissions and waste emissions from the applicable facilities, and to allow owners/operators to submit empirical emissions data to demonstrate the extent to which a charge is owed.

With this clear direction from Congress, INGAA recommends EPA forgo finalization of the portion of the Proposed Rule related to Subpart W. In a final rule, EPA can justify forgoing the Subpart W revisions due to the congressional mandate in the IRA and state that it will propose comprehensive Subpart W revisions to fulfill the mandate in the IRA. After finalization, EPA can analyze the IRA and develop a new rulemaking that responds to the congressional mandate. This rulemaking can include new requirements that respond directly to the IRA, as well as

portions of the Proposed Rule related to Subpart W that EPA deems to be of continued relevance and importance to the program. A single rulemaking will reduce the burden on both industry and the Agency.

INGAA advocates for improved data quality and further quantification, which aligns with Congress's goal of utilizing empirical data. Working through these (often highly complicated) issues in the context of a new rulemaking will provide EPA, regulated stakeholders, and the public at-large the needed time and proper regulatory vehicle to make a single, comprehensive update to GHGRP Subpart W.

Commenter Name: Ron Ness
Commenter Affiliation: North Dakota Petroleum Council (NDPC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0225-A1
Comment Excerpt Number: 1

Comment Excerpt: In 2021, oil and natural gas accounted for 68% of energy consumption in the United States.[1] The oil and natural gas industry is an integral part of the U.S. economy, and affordable energy benefits all Americans. Cost-effective and balanced regulation of the energy industry can benefit human health and the environment, but economic impacts must always be considered. In recent years we have seen how high energy costs have driven inflation, increasing the cost of essential goods and services for families across all social and economic groups.

We understand that the original intent of the rule was to assess significant sources of greenhouse gas (GHG) emissions for potential new regulations, and it now appears to be moving in the direction of requiring an estimation of all GHG and methane emissions for fee collection. Any final rule will directly impact our industry resulting in immediate economic impacts today and on future generations. For this reason, NDPC requests the EPA take great care in finalizing this proposal.

Footnotes

[1] https://www.eia.gov/energyexplained/us-energy-facts/

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0230-A1
Comment Excerpt Number: 3

Comment Excerpt: The IRA mandates that EPA revise the Subpart W EF to improve their accuracy by the time that the tax is imposed — 2024 emissions. It is now the end of 2022. This

mandate under the IRA raises serious issues regarding the value of EPA continuing to pursue the essentially interpretive EF process in this proposal where EPA is relying on studies that EPA frequently criticizes as falling short of the quality of information that it wants for EF. EPA needs to develop and execute analyses of emissions that produce a robust data assessment and this action will need to begin immediately to meet the 2024 mandate in the IRA. Resources should not be diverted to revisions of the current Subpart W EF that are based on assessments of limited information with the 2024 deadline looming over the Agency.

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0230-A1
Comment Excerpt Number: 8

Comment Excerpt: The proposal contains EF for sources previously not included in the GHGRP. These pose opportunities for challenges regarding their accuracy that will have to be addressed over time. Given that these factors would be used briefly before Subpart W must be revised as required by the IRA, EPA should defer action on these new additions and address them thoroughly and accurately in its new analysis. Two of these are "methane slip" calculations for combustion engines and other large release events. Each of these also creates the potential for allegations of misreporting and, therefore, should be accurately developed.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 1

Comment Excerpt: The Associations Recommend that EPA the Subpart W Portion of the Proposed Rule and Develop a New Single Subpart W Proposal that Incorporates Changes Needed to Implement the New Methane Fee as Congress Required in the Inflation Reduction Act.

On August 16, 2022, President Biden signed into law the Inflation Reduction Act (IRA).[9] The IRA mandates the EPA impose and collect a charge on methane emissions from the petroleum and natural gas sector, upstream of gas distribution, where methane emissions from an applicable facility exceed a pre-determined waste emissions threshold (methane fee).[10] The fee starts at $900 per metric ton of methane in calendar year 2024, increasing to $1,000 in 2025, and then topping out at $1,500 in 2026 and later years. While our members' natural gas distribution operations are excluded, other member gas utility operations such as intrastate natural gas

transmission pipelines, compression, liquefied natural gas (LNG) peak-shaving storage facilities, and intrastate underground storage could be subject to the new fee. Congress determined that relevant aspects of the program, including which facilities are subject to the charge and how to calculate the amount of methane subject to the charge, will be based on EPA's GHGRP Subpart W.

To implement the methane fee program, Congress required EPA to revise Subpart W within two years (by August 16, 2024) to ensure that reporting and calculation of the methane charge are based on empirical data to accurately reflect the total methane emissions and waste emissions from the applicable facilities, and to allow owners/operators to submit empirical emissions data to demonstrate the extent to which a charge is owed.

Given this clear direction from Congress, EPA should postpone finalizing the portion of the Proposed Rule related to Subpart W. EPA can finalize other portions of the Proposed Rule and can justify postponing finalization of Subpart W revisions on the rational grounds that Congress mandated additional changes to Subpart W in the Inflation Reduction Act in August 2022, after EPA published the Proposed Rule. Postponement will allow EPA to develop a single Subpart W rulemaking that incorporates changes needed to comply with the Congressional mandate. This later rulemaking can include new requirements that respond directly to the IRA, as well as portions of the Proposed Rule related to Subpart W that EPA deems to be of continued relevance and importance to the program. A single rulemaking will reduce the burden on both industry and the Agency.

Both the Associations and INGAA advocate for improved data quality and quantification, including options for direct measurement, which aligns with Congress's goal of utilizing empirical data. Working through these (often highly complicated) issues in the context of a new rulemaking will provide EPA, regulated stakeholders, and the public at-large the needed time and proper regulatory vehicle to make a single, comprehensive update to GHGRP Subpart W.

Footnotes

[9] See https://www.govinfo.gov/content/pkg/BILLS-1 17hr5376rh/pdf/BILLS-117hr5376rh.pdf.

[10] See Sec. 60113. Methane Emissions Reduction Program.

Commenter Name: Caroline Hon and Ross W. Turini
Commenter Affiliation: National Grid USA
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0238-A1
Comment Excerpt Number: 1

Comment Excerpt: The National Grid Companies Recommend that EPA Postpone the Subpart W Portion of the Proposed Rule and Develop a New Subpart W Proposal that Incorporates Changes Needed to Implement the New Methane Fee as Required in the Inflation Reduction Act.

On August 16, 2022, President Biden signed into law the Inflation Reduction Act (IRA) that requires EPA to impose and collect a charge on methane emissions from the petroleum and natural gas sector, upstream of gas distribution, where methane emissions from an applicable facility exceed a pre-determined waste emissions threshold. Congress determined that relevant aspects of the program, including which facilities are subject to the charge and how to calculate the amount of methane subject to the charge, will be based on EPA's Greenhouse Gas Reporting Program in Subpart W. To implement the new methane fee program, Congress is requiring EPA to revise Subpart W within two years (by August 16, 2024) to ensure that reporting and calculation of the methane charge are based on empirical data to accurately reflect the total methane emissions and waste emissions from the applicable facilities, and to allow owners/operators to submit empirical emissions data to demonstrate the extent to which a charge is owed.

Given this clear direction from Congress, EPA should postpone finalizing the portion of the Proposed Rule related to Subpart W. It is rational to postpone finalizing this portion of the Proposed Rule because Congress mandated additional changes to Subpart W in the IRA in August 2022, after EPA published the Proposed Rule. Postponement will allow EPA to develop a single Subpart W rulemaking that incorporates changes needed to comply with the Congressional mandate. This later rulemaking can include new requirements that respond directly to the IRA, as well as portions of the Proposed Rule related to Subpart W that EPA deems to be of continued relevance and importance to the program. A single rulemaking will reduce the burden on both industry and the Agency.

The National Grid Companies advocate for improved data quality and quantification, including options for direct measurement, which aligns with Congress's goal of utilizing empirical data. Working through these complicated issues in the context of a new rulemaking will provide EPA, regulated stakeholders, and the public the needed time and proper regulatory vehicle to make a single, comprehensive update to the GHG reporting program in Subpart W.

Commenter Name: Michael G. Dunn
Commenter Affiliation: Williams Companies, Inc. (Williams)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0242-A1
Comment Excerpt Number: 8

Comment Excerpt: With the passage and signing of the Inflation Reduction Act (IRA) on August 16, 2022, after EPA released this Proposed Rule, Williams believes the Agency should strongly consider forgoing finalizing the Proposed Rule as it relates to Subpart W. The IRA mandates the EPA impose and collect a fee on methane emissions from the petroleum and natural gas sector where methane emissions from an applicable facility exceed a pre-determined emissions threshold. Congress identified relevant aspects of the program, including which facilities are subject to the fee and how to calculate the amount of methane subject to the fee. Because this determination and calculation will be based on EPA's Greenhouse Gas Reporting Program Subpart W, Congress mandated that EPA revise Subpart W in accordance with the new

statute. If EPA finalizes the current proposed revisions to Subpart W and subsequently engages in new rulemaking to address the congressionally mandated revisions two to three years from now, not only does this create additional administrative burden for the Agency, but it will also create a significant impact to Williams and the industry. Williams supports accomplishing this revision in a single rulemaking effort and believes EPA has justifiable reasons to pause the specific Subpart W revisions in the Proposed Rule.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 12

Comment Excerpt: EPA should postpone finalizing the Subpart W portion of the Proposed Rule and should conduct a new, single Subpart W rulemaking to incorporate changes called for by the IRA. In the alternative, EPA should issue a notice explaining how the passage of the IRA Impacts the implementation of the Subpart W requirements. Congress passed the IRA on August 16, 2022, a full month after EPA issued this proposed rule. The IRA imposes a fee on methane emissions reported pursuant to this subpart beginning with emissions reported for calendar year 2024. The IRA requires EPA, within two years of enactment of the IRA (by Aug. 2024), to revise the requirements of Subpart W to ensure that the reporting and calculation of fees are based on empirical data and accurately reflect total methane emissions. In addition, EPA has yet to propose regulatory text for the initial revised oil and gas New Source Performance Standards (NSPS)[18] and the supplemental notice, which is referenced by the GHGRP proposed rule and is currently under EO 12866 review by the Office of Management and Budget. To avoid confusion and duplication and to save resources for both the agency and industry, EPA should postpone finalizing the Subpart W portion of the Proposed Rule, as requested above. EPA can then conduct a new integrated Subpart W rulemaking that knits together the IRA revisions, the oil and gas NSPS related provisions, and other revisions from this proposal. EPA should expeditiously issue a notice clarifying the process and timing for promulgating the recordkeeping and reporting requirements under Subpart W required by the IRA Companies will need to make operational and spending choices to comply with both the NSPS and the IRA's new empirical Subpart W rules and need to synchronize the two efforts as much as possible to minimize compliance costs.

Footnotes

[18] 86 FR 63110 (November 15, 2021).

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 16
Excerpt Status: Not Started

Comment Excerpt: The MSC notes difficulty in commenting on the proposed GHGRP as it has significant overlap with the developing regulation, "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review" (Methane Rule) and its reference in the Inflation Reduction Act (IRA). This hinders making complete comments as the update to the Methane Rule is not to be published until October of 2022 and regulations related to the IRA, including details to its methane tax, have yet to be developed.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 14

Comment Excerpt: EPA's proposed GHGRP revisions do not accomplish the legislative mandate in Sec. 60113 of the IRA as it relates to ensuring reporting under 40 CFR Part 98 — Subpart W and the associated calculation of "Waste Emissions Charges," better referred to as a methane taxes, is based on "empirical data."

In contrast, EPA's proposed revisions to the GHGRP still require reporters to utilize "one-size fits all" emissions factors (many of which have been increased compared to current GHGRP rules, without proper justification or explanation, and would likely cause further overstatement of emissions) AND adds requirements for the reporting of new emissions sources (*i.e.*, "methane slip" from compressor drivers) without an option to use actual measured "empirical data" even when it is readily available (*i.e.*, NSPS JJJJ compliant emissions performance tests for compressor drivers).

AIPRO strongly encourages the EPA to withdraw the proposed revisions in Docket ID No. EPA-HQ-OAR-2019-4024 and propose new updates to its GHGRP that allow reporters to utilize empirical data representative of their actual emissions and accomplish the legislative mandate of the IRA. Further, AIPRO welcomes the opportunity to collaborate with the agency as it works to draft updated revisions to the GHGRP rules.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 7

Comment Excerpt: Under the recently passed Inflation Reduction Act, Congress established the Methane Emissions Reduction Program (MERP) under the Clean Air Act.[12] One important charge to EPA in MERP is the requirement to: "revise the requirements of subpart W … to ensure the reporting under such subpart … are based on empirical data …, accurately reflect total methane emissions and waste emissions from the applicable facilities and allow owners and operators of applicable facilities to submit empirical emissions data…"[13]

As discussed more fully below, there are limitations to EPA's existing emission factors used to estimate methane emissions in Subpart W. Such limitations mean that the methane emission estimates are neither accurate nor empirically-based. [14] Thus, any finalized updates flowing from this proposal do not, and cannot, satisfy EPA's obligation to revise Subpart W as required under MERP. EPA should clearly state as much in its finalization of this rulemaking.

Footnotes

[12] Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 60113 (to be codified at 42 U.S.C. § 7436(h)).

[13] Id. § 60113(h).

[14] Because "empirical data" is undefined in MERP, the term takes its ordinary meaning, informed by the statutory context. Kouichi Taniguchi v. Kan Pac. Saipan, Ltd., 566 US 560, 566 (2012). "Empirical" means "originating in or based on observation or experience" and "capable of being verified or disproved by observation or experiment." Merriam-Webster, Definition of Empirical, https://www.merriam-webster.com/dictionary/empirical. The long-standing and well-documented inaccuracies of subpart W clearly establish that the current methodologies to report methane emissions under Subpart W do not meet this definition, especially under the statutory context of requiring accurate methane emissions.

Commenter Name: Brian S. Taylor
Commenter Affiliation: Project Canary, PBC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0186-A1
Comment Excerpt Number: 3

Comment Excerpt: In the recently passed Inflation Reduction Act (IRA), the act states that the EPA Administrator shall revise the requirements of 40 CFR Part 98, Subpart W no later than 2 years after the date of enactment, to "ensure the reporting under such subpart, and calculation of charges under subsections (e) and (f) of this section, are based on empirical data, including data collected pursuant to subsection (a)(4), accurately reflect the total methane emissions and waste emissions from the applicable facilities, and allow owners and operators of applicable facilities to submit empirical emissions data[...]." Based on the significant benefits and with a rapidly improving technology, we recommend that EPA, in its forthcoming Subpart W revision required

by the IRA, propose CM that meets relevant performance standards, as an allowable option for emissions quantification.

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0230-A1
Comment Excerpt Number: 1

Comment Excerpt: Under the IRA, emissions reported under the Greenhouse Gas Reporting Program (GHGRP) shift from being estimates that are questionably accurate and for which there are legitimate differences over the details of the calculation. Instead, these reported amounts become "taxable events." That is, each emission bears a specific cost for the operator. Those values then become subject to audit by EPA, and differences between EPA's calculations and operators' calculations become subject to enforcement action under the CAA by the Office of Enforcement and Compliance Assurance (OECA) and ultimately fines.

This change places a much larger burden on EPA to assure that the EF are accurate. No more should EPA be using 19 intermittent pneumatic controls in the mid-1990s as the basis of EF. Similarly, the process must be straightforward and clearly understood. Unfortunately, this change will also serve to suppress individual operators from developing new and better emissions estimating techniques. Why? If an operator uses a different approach — unless it is given a specific sanction by EPA, including OECA that choice becomes an obvious target for review by OECA. Past history with Subpart OOOO shows that OECA can develop its own approach to compliance even if the operator is using the recommendations of EPA's technical staff. OECA then threatens or imposes massive fines until the operator adheres to the OECA approach. Given the magnitude of emissions calculations under Subpart W and the structure that it is solely a non-delegated federal requirement, OECA will have vast powers to challenge any reported emissions value, with the burden of validation falling on the operator.

A-24. Comments re: site-wide direct measurement or empirical measurement (not related to equipment type)

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 7

Comment Excerpt: The USEPA referenced the GRI/EPA - Methane Emissions from the Natural Gas Industry, Volume 9: Underground Pipelines study from 1996 as the basis for an increase of nearly double on gathering pipeline population emission factors. The MSC notes that actual data collected via monitoring surveys on gathering pipelines should provide a more

accurate basis for emission estimates than the 1996 study. In addition, the MSC requests that the USEPA allow direct measurement as an option to estimate emissions from equipment leaks for all industry segments. The Inflation Reduction Act clearly directs the USEPA to allow an operator to submit empirical emissions data that prioritizes accuracy of emissions actually emitted. Requiring the use of emission factors that may significantly overstate emissions resulting in owners and operators paying taxes in excess of actual emissions does not appear to be in the spirit of the Inflation Reduction Act. The USEPA should respect the legislation's intention and incorporate this option into the rulemaking.[4]

Footnotes

[4] Section 136 (h) of the Inflation Reduction Act (P.L. 117-169).

Commenter Name: Angie Burckhalter
Commenter Affiliation: The Petroleum Alliance of Oklahoma
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0220-A1
Comment Excerpt Number: 1

Comment Excerpt: It is critical that EPA withdraw and amend the Proposed Rule to allow the use of empirical data so that reporters under subpart W avoid unnecessary and excessive emission charges. Additionally, the use of empirical data instead of EFs or estimation methodologies allows operators to better monitor and manage emission reductions and/or eliminate emissions. It is unnecessary for EPA to finalize the Proposed Rule now and then shortly thereafter reopen the rule to make additional changes in accordance with the IRA. Conducting "back-to-back" rulemakings on this issue is resource intensive for both EPA and industry. It is appropriate and reasonable for EPA to withdraw the Proposed Rule and conduct one rulemaking. The Alliance requests EPA withdraw the Proposed Rule and conduct one rulemaking to incorporate empirical data required under the IRA

Commenter Name: Karen Knutson
Commenter Affiliation: Chevron
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0184-A1
Comment Excerpt Number: 2

Comment Excerpt: Methane reporting under the GHGRP should move toward the use of empirical data for measurement-informed reporting. This requires both advanced technologies for direct measurement of methane that work at-scale across dispersed assets in the U.S. oil and gas sector and protocols for consistent incorporation of information from these advanced technologies into emission inventories. At Chevron, we have trialed thirteen advanced methane

detection devices across aircraft, drone, satellite, and continuous monitoring platforms to understand what works across different assets and geographic locations. We have also supported a multi-stakeholder initiative with Veritas, a GTI Energy Methane Emissions Measurement and Verification Initiative, that aims to develop the technical protocols for measurement, reconciliation, and assurance that would be needed for consistent, measurement-informed emission reporting. Based on our work with advanced technologies and protocols, we believe that the GHGRP will continue to need both emission factors for smaller dispersed sources and data from advanced technologies to reach a goal of empirical methane reporting on a national scale and that future updates to Subpart W will be needed as technologies and protocols mature.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 19

Comment Excerpt: Current methodologies in Subpart W that require facilities to apply general emission factors are not "empirical" because they do not provide for an analysis that is based on actual observations or experience and verified by actions that will impact emissions. See Oxford English Dictionary (defining "empirical" to mean "based on, concerned with, or verifiable by observation or experience rather than theory"). The current methodology considers all pipes to be leaking at some rate defined by EPA's equations without regard to efforts to reduce emissions. Providing more accurate reporting based on empirical data is imperative for companies, such as Duke Energy, that are taking steps to better quantify emissions and that are undertaking initiatives to achieve real reductions in emissions. It is important that the data reported under the GHGRP be accurate if the program is to be meaningful and provide a useful platform for quantifying emissions and reductions of greenhouse gas emissions.

Commenter Name: Rodney Baker
Commenter Affiliation: Arkansas Independent Producers and Royalty Owners (AIPRO)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0183-A1
Comment Excerpt Number: 1
Excerpt Status: Not Started

Comment Excerpt: AIPRO membership and the Oil & Gas Industry as a whole, recognizes the importance of reducing GHG emissions, has made significant strides to do so over the past several years and continues to evaluate and implement technologies and solutions to accomplish further GHG emissions reductions. Further, the industry is doing so despite EPA's antiquated GHGRP and its "one-size fits all" emissions factor-based approach for calculating GHG

emissions; which, in many cases, causes GHG emissions to be overstated. AIPRO recommends that the EPA allow well established and accomplished American innovation to lead the way in GHG emissions reductions going forward. As opposed to, prescriptive and poor-fitting regulations that discourage, and, in many cases, disallow the use of emerging emissions detection and control technologies that are proven to aid in GHG emissions reductions. [See DCN EPA-HQ-OAR-2019-0424-0183-A1 for Figure 2, Trends in energy-related carbon dioxide emissions and key indicators.]

Commenter Name: Colin McKee
Commenter Affiliation: Petroleum Association of Wyoming (PAW)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0232-A1
Comment Excerpt Number: 3

Comment Excerpt: A second issue PAW requests the EPA consider is allowing operators more optionality in reporting emissions. While the standard emission factors applied by through the GHGRP may streamline reporting, it does not encourage operators to apply the newest emission detection technologies or emission controls. With the routine emission monitoring anticipated under the upcoming OOOO rules, operators will have more real-time information regarding facility emissions. However, as currently proposed, the GHGRP will not allow operators to use field-wide data to identify leaks, make corrections and report accurate data. Instead, the EPA is only opting for the aforementioned emission factors. Aligning requirements among various EPA regulations and allowing for more options to identify emissions will result in fewer emissions. Similarly, if new leak detection technologies conclude no emissions are occurring in the field, operators should be able to utilize that data to fulfill their requirements under the GHGRP. Giving this industry more options is a win for lowering emissions, streamlining reporting and reporting more accurate data. Similarly, this will better ensure no unnecessary fees are applied through the IRA methane fee.

Commenter Name: Kathleen Sgamma
Commenter Affiliation: Western Energy Alliance
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0239-A1
Comment Excerpt Number: 2

Comment Excerpt: In addition to the public's interest in consistency and accuracy in published data, increased importance has been placed on the need for accuracy as a result of events that have transpired since the proposal was published. On August 16, 2022, President Biden signed the IRA. The Act itself contains a breadth of public policy changes that will not be discussed in these comments, but of relevance to the proposed rule it includes the creation of a new methane

emissions fee that is based on the methane intensity of the operator as calculated in the GHGRP. While this new fee may impact Alliance members in different ways, it is important to note that in using the GHGRP for an emissions tax or fee system requires additional flexibility within the rule for affected companies to augment their reporting based on the actual circumstances creating their emissions. For example, in field studies, it has been shown across basins that the same types of equipment, when subject to different facility design and maintenance programs, can lead to different emission levels, even with similar underlying production. Under the current GHGRP, there are several emission factors and data points that do not allow for flexibility that would accurately reflect those changes. EPA is headed in the right direction by offering an alternative to the use of engineered average-based emission factors when allowing for leak detection survey information to inform reported numbers for pneumatic controllers, however, there is still much room for improvement within this space. For example, as methane detection technology has improved over the last decade, deployment of field-wide emissions detection has increased significantly. These aircraft flyovers, drone information, and potentially in the future satellite data, give operators a very useful snapshot into their current emissions information and can be used to adjust maintenance timelines for equipment, adjust facility designs overall, and most importantly can be used to identify otherwise unknown emissions sources. Within its proposal under the OOOO rulemaking suite, EPA appears to recognize the importance and value of these types of field-wide deployments, but this GHGRP rulemaking fails to drive policy in that direction. Additionally, EPA has been directed by the IRA to study and develop new emission factors and monitoring capability. By allowing for field-wide emissions detection and measurement to inform equipment-specific data for oil and gas facilities, or at the very least for large equipment like tanks, compressors, engines, and other in-field equipment, the GHGRP would not only help to drive the faster adoption and development of those technologies, but it would also bring in much more accurate data for use in making more informed policy decisions.

This is similar to the approach designed within the intermittent bleed pneumatics program. If a flyover of a sufficient detection threshold identifies that a facility is operating without detectable emissions at a semi-annual or greater frequency, the reporting company needs to be permitted to supplant that information for some of the emission factors currently in use. While this may not be appropriate for some smaller sources that are undetectable by flyover equipment, it provides both an incentive for companies to improve their detection and serves as a differentiator for those companies that have maintenance and detection programs that are functioning effectively.

Commenter Name: Pamela A. Lacey, Tim Parr, and Erin Kurilla
Commenter Affiliation: American Gas Association (AGA) and American Public Gas Association (APGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0236-A1
Comment Excerpt Number: 18

Comment Excerpt: The Associations Urge EPA to Allow an Option for Using a Robust AMLD Program Combined with Direct Measurements to Develop Company/Utility-Level Emissions Quantification for Reporting Under Subpart W.

While AMLD is not the best tool for measuring emission flow rates from individual sources such as a leak on a distribution main, as discussed above, there are promising developments that now open a new possibility of quantifying the collective methane emissions of a utility's systemwide operations across all assets with a high level of certainty. This requires a robust program encompassing multiple data captures (whether by vehicle, drone, and/or satellite) with the AMLD backed up with a robust, statistically valid sample of direct measurement data. It is still relatively costly and sophisticated compared with the traditional leak detection and emission factor method, so it is best introduced as an option that well-resourced utilities can opt to pioneer. As the industry gains experience and more utilities participate, economies of scale should help make this method more assessable to smaller gas utilities. Demonstration projects using this methodology are already occurring in the field by AGA members SoCalGas working under the auspices of the California Air Resources Board (CARB), Southern Company Gas based in Atlanta, Georgia, and Duke Energy's Piedmont Natural Gas Division based in North Carolina.

As an example, a recent study by AGA member company Pacific Gas & Electric Company (PG&E) and Picarro, an AMLD vendor, describes a method for using AMLD to quantify gas distribution system-wide emissions with a high confidence level. The procedure described in the paper also included fixing large leaks to reduce emissions reductions which were then confirmed in subsequent surveys. [Commenter attached a copy of the paper, to be published in the Environmental Science & Technology journal by the American Chemical Society, as Appendix B]. It should be noted that there are now several AMLD vendors offering mobile cavity-ring down mass spectrometers or mobile laser spectroscopy technologies, coupled with sophisticated modeling and the ability to differentiate biogenic sources.[30]

In addition, GTI Energy is working with companies across the natural gas value chain, academics, and NGOs in its Veritas initiative to build a consensus segment-specific protocols to reconcile and verify uncertainty levels for bottom-up and top-down measurements and methodologies, including the AMLD and system-wide emissions quantification methodology.[31] GTI Energy has announced plans to release the Veritas segment specific protocols in December 2022. This would allow time for companies to deploy systems and procedures to use the protocols for quantifying emissions in 2024 for Subpart W reports to be filed in March 2025. We offer this in response to EPA's request for comments "on alternative methods for quantifying leaks... along with supporting information and data."[32]

In the alternative to including this as an option for regular Subpart W reporting in the first reporting cycle under the revised final rule, should EPA decide against that path at this juncture, then The Associations urge EPA to allow this option through a two-year pilot program under the Best Available Monitoring Methods (BAMM) provisions in Subpart W to allow willing utilities to road-test and improve the emerging company/utility system-level AMLD approach. This would further build the record for adopting this as an option in the regular Subpart W reporting program in EPA's next round of Subpart W revisions.[33]

Footnotes

[30] The Associations are aware of five currently available AMLD systems (listed alphabetically):

1. ABB MobileGuard™ - https://new.abb.com/products/measurement-products/analytical/laser-gasanalyzers/advanced-leak-detection/abb-ability-mobile-gas-leak-detection-system

2. Aeris Responder™ - Acquired by Project Canary in March 2022. - https://aerissensors.com/technology/.

3. Aclima- https://www.aclima.io

4. Heath Discover™- https://heathus.com/products/discover-advanced-mobile-leak-detection-amld/

5. PICARRO Surveyor™- https://www.picarro.com/sites/default/files/2017- 03/Picarro Surveyor Brochure _0.pdf

[31] See https://www.gti.energy/veritas-a-gti-methane-emissions-measurement-and-verification-initiative/. The segment-specific Veritas Measurement Protocols are intended to provide a framework for quantitative measurement of methane emissions from sources and discrete sites within each segment of the natural gas value chain from production through distribution. Whole site, whole system, and focused methane measurement technologies are evolving rapidly, and the measurement protocols are not prescriptive in terms of the measurement technologies to be deployed. The Veritas measurement protocol in conjunction with the reconciliation protocol will reconcile measured emissions with emission factor-based inventories.

[32] 87 Fed. Reg. at 36,977.

[33] In the Proposed Rule preamble, EPA also requested comments to obtain "information that may aid in potential future revisions." 87 Fed. Reg. at 36,920.

Commenter Name: Karen Knutson
Commenter Affiliation: Chevron
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0184-A1
Comment Excerpt Number: 5

Comment Excerpt: Our direct experience with onshore aircraft-based technologies has pointed to multiple benefits that would support EPA's methane reporting and reduction goals:

Mapping to source types — Certain aerial surveys have sufficient resolution to map detected plumes to individual pieces of equipment on a site. We believe this type of granular information would be helpful in updating emissions by source category in the GHGRP.

Existing support from regulated entities — Many leading companies, including Chevron, have increasingly incorporated aerial surveys into their voluntary methane reduction programs.

Detection limits — There are alternative technologies that can meet detection thresholds of 10 kg/hr. For the production sector, an aerial service provider (Bridger Photonics) advertises a detection limit of 3 kg/hr with a 90% probability of detection. When combined with emission-factor based estimates for smaller individual emission sources (pneumatics, etc.) that already are included in the GHGRP, we believe that this approach would cover most emissions from oil and gas production operations.

Compatibility with annual reporting cycles — With appropriate timing for aerial vendors to scale-up their services, we believe that the survey speed and timelines for information receipt for

operators would be compatible with annual GHGRP reporting cycles at reasonable cost to reporting entities.

Considerations for small operators — We believe cooperative aerial surveys in production basins can be cost-effective for smaller operators since their sites can be grouped with others nearby, which can increase access for smaller operators to new technology.

In our view, there must be a concerted effort at EPA, other federal agencies, and state agencies to align requirements for compliance and emissions reporting to ensure that these programs are successful. Advanced methane monitoring technologies are the key to aligning requirements and implementing measurement-informed reporting across all methane-emitting sectors. These techniques require different considerations than OGI-based surveys and data reporting frameworks.

Commenter Name: Asa Carre-Burritt, PhD
Commenter Affiliation: Bridger Photonics, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0253-A2
Comment Excerpt Number: 3

Comment Excerpt: Bridger advocates for the EPA to develop comprehensive pathways to optionally use empirical data from advanced measurement technologies to report emissions under subpart W.

The Proposed Rule includes provisions to incorporate emission rate measurements from an advanced technology being used for an alternative fugitive emissions monitoring and repair program for well sites and compressor stations (an amendment within proposed 40 CFR Part 60 subparts NSPS OOOOb and EG OOOOc) as part of the "engineering estimates" and "best available data" within the calculation methodology for the proposed new source, "other large release events"[c] However, advanced measurement technologies with accurate quantification, high sensitivity, and precise emissions source localization offer advantages beyond detecting and quantifying emissions above the 25 $mtCO_2e$ threshold defined for "other large release events." There are many other emission sources resulting from normal processes, equipment failure, malfunction, or other abnormal operating condition that are below this threshold but that advanced measurement technologies may be capable of quantifying. For example, these advanced measurement technologies offer a pathway to directly detect and quantify emissions from (a) equipment leak components, (b) malfunctioning pneumatic devices, (c) open or improperly seated thief hatches on atmospheric storage tanks and malfunctioning separator dump valves, (d) poorly performing or unlit flares, (e) methane slip from lean burning compressor exhaust, and (f) gathering line emissions.

Footnotes

[c] We request that the EPA uses language making it clear that advanced technologies can be used in calculations for emissions volumes from other large release events across all subpart W industry segments.

Commenter Name: Asa Carre-Burritt, PhD
Commenter Affiliation: Bridger Photonics, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0253-A2
Comment Excerpt Number: 1

Comment Excerpt: Current legislative proceedings illustrate the profound impact that the GHGRP can have on regulatory decisions and the national economy. For example, the Inflation Reduction Act includes a methane waste emissions charge assessed according to subpart W reported emissions, and new source performance standards (NSPS proposed part 60 subpart OOOOb and EG OOOOc) are being developed with consideration to information gathered through subpart W. Operators should have the option to broadly leverage empirical measurements to demonstrate emissions reductions from improved operational practices that might not be captured using tabulated emissions factors. Meanwhile, ingesting more empirical data can help the EPA better understand emissions drivers and set more impactful performance standards.

The oil and gas industry already uses advanced measurement technologies that provide high-resolution data that would be appropriate for subpart W reporting. For example, Gas Mapping LiDAR™ is widely deployed and able to both detect and quantify over 90% of methane emissions in the production segment. In certain areas, this technology offers advantages compared to existing emissions survey and quantification methods included in subpart W.

A greater volume of emissions is detected by Gas Mapping LiDAR™ compared to OGI surveys[2] and, relationally, a greater volume is expected to be detected compared to EPA M-21.[3]

- Complete spatial coverage is achieved within line of sight from the air. This means emissions resulting from venting, equipment malfunction, and abnormal operating conditions are all characterized without respect to whether the emission source is anticipated and required to be screened.
- Methane from poorly performing flares and entrained in compressor exhaust can be empirically characterized.
- Emission sources that are high off the ground such as unlit flares and improperly seated thief hatches are easily measured.
    - Reduced opportunity for instrument user error

    - Methane emissions are automatically processed, imaged, and superimposed onto georegistered, concurrently acquired digital photographs. The only two notable variables controlled for in the field are flight speed and height.
    - A scan coverage audit is included as part of the data product.
    - Measurement metadata such as date and time is automatically recorded to the data set.

- • Reduced burden on subpart W reporters
    - Aerial deployment means rapid and expanded coverage at reduced cost.[4]
    - With a greater volume of emissions detected and remediated, recovered revenue can offset costs.
    - Safety is increased by reducing time field personnel spend on site.
    - Ground traffic is reduced.
    - Instrument calibration and maintenance is handled by the instrument manufacturer

While advanced measurement technologies can provide advantages relative to existing subpart W methods, performance characteristics must be achieved to qualify the technology for a given application. The following paragraph illustrates how the performance characteristics of Gas Mapping LiDAR™ influence emissions characterized at wells sites. A detection sensitivity of 3 kg h-1 with 90% PoD [5,6] catches the vast majority of emissions at typical well sites within production basins. An aggregate quantification error of +8.2% demonstrates that emissions are accurately quantified for a set of measurements. [7] Emissions sources localized within ~2 m in all 3 dimensions enables operators to attribute emissions to equipment or spatially separated components. In some cases, the emitting component (*e.g.* flare stacks or thief hatches) may be directly identified from that dataset which includes aerial photography. If the emitting component is not obvious from Gas Mapping LiDAR™ data, a follow up ground-based investigation, for example with an OGI camera, can help link the detected emission to the specific emitting component. Even though Bridger describes the performance of Gas Mapping LiDAR™ as an example of how advanced measurement technologies can inform subpart W reporting, provisions for using an advanced technology should be based on technology performance and impartial to the technology type. Performance metrics should include emission detection sensitivity for a given probability of detection (PoD), quantification error, spatial coverage (including information on whether the technology characterizes lofted or hot emissions), and emission source localization uncertainty. These metrics are necessary to ensure that (a) the vast majority of emissions are detected (b) that they are appropriately quantified (c) and that they can be attributed to individual pieces of equipment or equipment componentry. Some advanced measurement technologies may only be suitable for finding high-volume emissions and cannot evaluate the breadth of emissions at a given facility for subpart W reporting. Adequately characterizing emissions from individual subpart W industry segment would require specific performance metrics. For the production and the gathering and boosting segments, Bridger recommends a detection sensitivity requirement of 5 kg h-1 with a 90% PoD. For a segment where important emissions are understood to be smaller relatively smaller, a lower detection sensitivity may be required.

Footnotes

[2] Tyner, D. R. & Johnson, M. R. Where the Methane Is - Insights from Novel Airborne LiDAR Measurements Combined with Ground Survey Data. Environ Sci Technol 55, 9773–9783 (2021).

[3] Pacsi, A. P. et al. Equipment leak detection and quantification at 67 oil and gas sites in the Western United States. Elementa 7, (2019).

[4] Bridger Photonics. Comment Letter re: EPA Proposed Rule-Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review (86 Fed. Reg. 63110). https://www.bridgerphotonics.com/sites/default/files/inlinefiles/BridgerPhotonics_CommentLetterOnProposedMethaneRule_0.pdf

[5] Johnson, M. R., Tyner, D. R. & Szekeres, A. J. Blinded evaluation of airborne methane source detection using Bridger Photonics LiDAR. Remote Sens Environ 259, (2021)

[6] Conrad, B. M., Tyner, D. R. & Johnson, M. R. Robust Probabilities of Detection and Quantification Uncertainty for Aerial Methane Detection: Examples for Three Airborne Technologies. EarthArXiv.

[7] Bell, C. et al. Single-blind determination of methane detection limits and quantification accuracy using aircraft-based LiDAR. Submitted by authors for peer review.

Commenter Name: Brian S. Taylor
Commenter Affiliation: Project Canary, PBC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0186-A1
Comment Excerpt Number: 4

Comment Excerpt: Project Canary appreciates continued efforts by the EPA, to revise source emissions factors based on updated data. However, Project Canary believes that in situations where monitoring technologies can more accurately provide emissions estimates from given sources of emissions, EPA should consider allowing companies to report such emissions using a technology that can show improved emissions reporting accuracy.

Commenter Name: Thure Cannon
Commenter Affiliation: Texas Pipeline Association (TPA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0193-A1
Comment Excerpt Number: 12

Comment Excerpt: EPA should allow additional flexibility for the use of alternative methods of emissions measurement and calculation. TPA supports EPA's proposal to allow calculations for "large release events" to be based on measurement data or engineering estimates as well as process knowledge/ best available data. We believe that EPA should be willing to accept data resulting from alternative methods of monitoring and quantification in *all* parts of the greenhouse

gas reporting program as industry continues to develop new and more accurate methods of monitoring and measurement through innovative approaches and technological advances. As stated above, the assessment of substantial methane charges pursuant to the IRA makes it even more essential that reporting companies have the ability to use the most accurate and reliable reporting methods possible. Allowing for the use of measurement data or other, more empirical calculation methods, as directed by Congress in the IRA,[10] would enable companies to more accurately measure and calculate emissions; as such these methods should always be allowed by the greenhouse gas reporting rules, but not required. Allowing companies to use alternative advanced technologies in complying with the greenhouse gas reporting rule would also likely have the effect of spurring further technological advances in this area, which should be encouraged by EPA.[11]

While we do not support that EPA move to requiring monitoring of all sources, we do believe that where more accurate data is available it should be accepted by EPA in lieu of the base emission factor calculation methodology. Emission factors are generally designed to estimate national averages and to develop national, regional, state, and local emissions inventories; but in many cases the use of emission factors does not result in accurate estimates of emissions from a single source or site. A company complying with the reporting rule should continue to be able to use the emission factor methodology as a minimum, but the rule should not rigidly prescribe the use of emissions factors when other measurement methods are better suited to the site at issue and would yield more accurate data. This is especially important now that federal fee assessments will be based on Subpart W reporting under the IRA. A better option would be to develop a hierarchical list of methodologies, similar to how states require data for criteria pollutant emissions inventories. For example, Texas Commission on Environmental Quality's (TCEQ's) guidance document for emissions inventory includes a general order of preference for reporting data.[12]

Footnotes

[10] 49 U.S.C. § 7436(h).

[11] This would also be consistent with a central theme of the IRA, which is to promote technological advancements in addressing climate change and related environmental issues.

[12] See 2021 Emissions Inventory Guidelines RG-360/21 at 49, available at https://www.tceq.texas.gzov/ downloads/air-quality/point-source/guidance/re-360-2 1-chapter-4.pdf.

Commenter Name: Douglas Jordan
Commenter Affiliation: Western Midstream Partners, LP
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0202-A1
Comment Excerpt Number: 1

Comment Excerpt: WES is generally supportive of the proposed revisions to the Greenhouse Gas Reporting Rule ("GHGRR"). We appreciate the EPA's proposed revisions to the rule and underlying emissions factors to incorporate more recent measurement and quantification studies.

We also encourage EPA to allow companies to use direct measurement and/or quantification data from their emissions sources (*e.g.*, compressor engines, compressor rod-packing, equipment leaks) as an alternative to the proposed emissions factors.

Commenter Name: Stephanie Kromer
Commenter Affiliation: Ohio Oil and Gas Association (OOGA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0246-A1
Comment Excerpt Number: 2

Comment Excerpt: The Ohio Oil and Gas Association's members and the oil & gas industry, understands the importance of reducing GHG emissions. The industry has made great progress over the years implementing new technologies to further decrease GHG emissions, despite EPA's antiquated GHG Reporting Program standardized emissions factor-based approach for calculating GHG emissions that does not properly reflect GHG emissions. In most cases, this approach overestimates GHG emissions. Instead of prescribing a "one-size-fits-all" approach, OOGA recommends that U.S. EPA encourages innovative technologies to reduce GHG emissions instead of ill-fitting regulations that do not allow for the use of proven, emerging emission reduction monitoring technologies.

Commenter Name: Kris Knudson
Commenter Affiliation: Duke Energy
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0185-A1
Comment Excerpt Number: 13

Comment Excerpt: Duke Energy urges EPA to consider an option for reporting that permits the use of direct measurement for other components, such as mains and services or the omission of components from the counts where it can be proven through empirical data there are zero emissions. These measurements may also be used to develop company-specific emission factors that would better represent and much more accurately report emissions and measure a company's progress toward emission reductions. Duke Energy has a multi-state pilot underway using satellite technology and ground validation tools to detect methane emissions. We are currently utilizing this work to participate in a demonstration project utilizing GTI's Veritas protocol. At such time that we have completed our pilot, validated our results, and achieved operational readiness, we believe EPA should allow the use of this directly identified and measured emissions data in lieu of the traditional Subpart W protocol of national emissions factors and facility counts. We recommend that EPA include in Subpart W a provision that will allow a facility to adopt alternate methodologies (subject to EPA review and approval) for determining

and reporting methane emissions based on its own studies using direct measurements and other empirical data.

Commenter Name: Howard R. Dieter
Commenter Affiliation: Jonah Energy LLC
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0200-A1
Comment Excerpt Number: 1

Comment Excerpt: Over the past several years pursuant to our work within OGMP 2.0, Jonah Energy has been developing the tools and techniques to direct measure various emission sources and to measure site level emissions representing a collection of emission sources. We have been comparing these measurements with activity and emission factor-based reporting and have certainly found differences in the results. We encourage EPA to develop a process to allow reporters to use measurement-based emission factors with appropriate documentation to more closely represent actual emissions from operations.

Commenter Name: Curtis J. Winner
Commenter Affiliation: New Mexico Gas Company (NMGC)
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0203-A1
Comment Excerpt Number: 7

Comment Excerpt: NMGC encourages EPA to allow an option under Subpart W to report emissions based on direct measurements and company/utility-specific emission factors for all sources in the reporting categories. This option would allow for more accurate quantification of actual emissions than is currently possible using EPA's default population-based emission factors and will improve emissions quantification for future methane fee requirements and company GHG emission reduction programs.

Commenter Name: Michael Arch
Commenter Affiliation: Range Resources Corporation
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0247-A1
Comment Excerpt Number: 3

Comment Excerpt: The primary overarching concern is that, in many instances, such as with pneumatic devices, onshore petroleum and natural gas production operators are not provided the opportunity to demonstrate through representative direct measurement, site- and facility-specific emissions factors based on representative sampling. Range supports representative measurement and sampling which will promote more accurate information and reliable emissions factors for reporting methane emissions from a facility.

EPA will be unable to achieve its stated goal of obtaining accurate GHG emissions data unless it ensures emission factors are well-grounded in data and it allows operators to demonstrate emission factors specific to their facilities through reasonable, direct measurement opportunities. To do so would be consistent with the other provisions of EPA's regulations that already provide operators with such regulatory flexibility,[1] and there is no reason not to include such options throughout the Proposed Rule. Indeed, including both approaches will only result in more reliable information being reported to EPA, which will benefit from such information in setting policies and making decisions.

Footnotes

[1] See, *e.g.*,40 C.F.R. 98.233(f) Liquids Unloading (Option to calculate emissions by measuring flow for various tubing diameter and pressure groupings or based on well-specific parameters); 40 C.F.R. 98.233(g) Completions with hydraulic fracturing (Option to measure gas rate from a specified number of example wells or volumes measured for each operation); and 40 C.F.R. 98.233(i) (Option to calculate emissions by equipment/event type or by flow-metered measurement of each event).

Commenter Name: Karen Knutson
Commenter Affiliation: Chevron
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0184-A1
Comment Excerpt Number: 4

Comment Excerpt: To enable measurement-informed reporting at the national scale and to support the MERP, EPA and other federal and state agencies must actively promote the use of alternative technologies, like aircraft and drones, and must align requirements across ongoing and anticipated rulemakings (*e.g.*, OOOOa, OOOOb, OOOOc, GHGRP, state regulations). Specifically, EPA should incentivize the use of alternative technologies, which are a needed pre-requisite for measurement-informed methane reporting at the national scale. As it is not a quantitative technology, optical gas imagining (OGI) will likely be unable to provide empirical data for emission reporting across source categories beyond equipment leaks.

Commenter Name: Scott Yager
Commenter Affiliation: Interstate Natural Gas Association of America (INGAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial

Document Control Number: EPA-HQ-OAR-2019-0424-0224-A1
Comment Excerpt Number: 4

Comment Excerpt: The Proposed Rule should support and encourage advanced technologies, such as OGI emissions quantification technologies, and create a pathway where proven systems can be an accepted measurement technology for methane emissions.

The OGI camera is used across numerous industries to visualize emissions from leaks and vents. Currently, Subpart W allows the use of the OGI cameras for the identification of leaks and maybe used to screen for emissions from certain vented sources, such as transmission storage tanks. Once emissions are identified with an OGI camera, additional measurement technologies or emissions calculation methodologies are employed to quantify the emissions.

Recent technology advancements have resulted in the development of OGI emissions quantification systems and offer a significant improvement opportunity in emissions quantification if/when technology performance is validated. For example, the QL320 developed by Providence Photonics and marketed by FLIR systems uses the output from a FLIR GF320 camera and translates the collected data into gas-specific emission measurements using a combination of an algorithm and gas-specific response factors. Once performance is proven, the QL320 and other advances in OGI quantification technology could be used to directly quantify methane emissions from equipment leaks, vents, and/or certain pneumatic devices as an alternative to using emission factors, currently approved monitoring technologies, and related assumptions.

The use of OGI or other leak quantification technology would be particularly beneficial for centrifugal and reciprocating compressor vent emissions. The onshore natural gas transmission compression industry segment is required to report emissions from transmission storage tanks that are attributable to leakage through the scrubber dump valve. Where required, emissions from these vents are estimated based on measurements performed using calibrated bagging, high volume samplers, flow meters, or acoustic leak detection devices.

A calibrated vent bag is a plastic bag of known volume that is placed over a vent and inflated via the vent emissions. The time required for the bag to fully inflate is recorded by the technician. This process is repeated three times and the average of the inflation times is used along with the known volume of the bag to compute the flow rate. This measurement method has obvious potential inaccuracies that are largely attributable to human error (*e.g.*, judgement of when the bag is "full," precision of inflation start and stop time, changes to flow rate due to backpressure caused by the bag). A flow meter may also be used to measure vent flow rate.

Alternatively, an acoustic leak detector could be used to measure flow across a normally closed valve upstream of the vent. Calibrated vent bags, flow meters, and acoustic leak detectors all have the potential to contribute to inaccurate emissions quantification. These techniques measure total exhaust flow, not pollutant emission rate.

The only vent measurement technology currently approved for use under Subpart W that directly measures methane emission rate is a high-volume sampler (HVS). However, the primary manufacturer of the HVS stopped production several years ago and HVS systems are being introduced into the market now but are not well established. An OGI emissions quantification system would provide a comparable alternative to the high-volume sampler for directly

measuring methane emissions from vents. This example is indicative of the general concern — Subpart W should be updated to support a reasonable pathway for integrating methane emissions monitoring and measurement technological advances.

An OGI emissions quantification system or other systems under development that provide the ability to quantify leaks without directly measuring at the equipment interface would also provide benefits in the areas of efficiency and safety. When using currently approved vent measurement methods, personnel are often required to access the vent via an elevated support surface (*e.g.*, ladder), which takes additional time and poses safety risks. A proven OGI emissions quantification system would provide accurate measurements that can be performed safely and efficiently at ground level.

Commenter Name: Caroline Alden
Commenter Affiliation: LongPath Technologies
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0190-A1
Comment Excerpt Number: 1

Comment Excerpt: The EPA has highlighted, in its proposed rule, important flaws in the current methodology for quantifying methane emissions from the oil and gas sector. Put simply, calculation-based methods maybe ill-equipped to address emissions sources with high variability and fat-tailed distributions. The sooner the EPA can move toward "top-down "or facility-wide measurement of emissions for reporting or validation of reported values, the sooner reported and measured emissions may be reconcilable.

We urge the EPA to adopt and encourage direct measurement of methane emissions. In particular, we encourage EPA to support techniques that can clearly demonstrate 1) verified accuracy of emission source quantification, 2) defensible detection limits, where not only large but also small emission rates can be accurately quantified, 3) coverage of all emission sources on the reporting facility, 4) and a high time-frequency of observing all potential emission sources, given the variability and distributions of high emitters.

Taken together, the direct measurement of emissions with verified quantification accuracy across the full spectrum of emission rates, of all equipment on site and with a high frequency, can allow accurate reporting of site-wide, regional and U.S.-wide emissions.

LongPath's continuous methane emissions monitoring has been validated for accuracy in emissions quantification at a range of upstream and midstream oil and gas facility types and across a wide range of emission rates and leak types.[1,2,3] [See DCN EPA-HQ-OAR-2019-0424-0190-A1 for Figure 1: Blind test validation of quantification accuracy for a range of emission rates of <0.2 kg/hr to <200 kg/hr from METEC and field testing at operational oil and gas facilities.]

Footnotes

[1] Coburn, S., Alden, C. B., Wright, et al., (2018). Regional trace-gas source attribution using a field-deployed dual frequency comb spectrometer. Optica, 5(4), 320. https://doi.org/10.1364/OPTICA.5.000320

[2] Alden, C. B., Coburn, S., Wright, R. J., et al. (2019). Single-blind quantification of natural gas leaks from 1 km distance using frequency combs. Environmental Science & Technology, 53(5), 2908-2917. https://doi.org/10.1021/acs.est.8b06259

[3] Alden, C. B., Wright, R. J., Coburn, S. C., et al. (2020). Temporal variability of emissions revealed by continuous, long-term monitoring of an underground natural gas storage facility. Environmental Science & Technology, 54(22), 14589-14597. https://dx.doi.org/10.1021/acs.est.0c031/5

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 34

Comment Excerpt: Section 136(h) directs EPA to update subpart W of the GHGRP to ensure reporting is (1) "based on empirical data," (2) "accurately reflect[s] the total methane emissions" from reporting facilities, and (3) allows reporting facilities "to submit empirical emissions data."[56] EPA must satisfy each of these components to meet Congress's directive and fulfill the intent of the legislation. "Empirical data" and "accurately reflect the total" are central terms and phrases that must be given effect when revising subpart W. The current subpart W reporting requirements that Congress has found inadequate for estimating total emissions use historical engineering calculations and emission factors derived from old studies. To update this approach so as to use empirical data and accurately capture the total quantity of emissions, EPA should rely on empirically based and validated probabilistic models. This will require EPA to develop and use empirical characterizations of emissions distributions as well as top-down validation data and methods. In enacting MERP, Congress recognized that the necessary improvements were sufficiently significant to require additional resources for EPA and appropriated $1.55 billion to help implement the program, a portion of which is allowed to be, and should be, used by EPA to fulfill this directive.[57]

MERP does not define "empirical data," so the term takes its ordinary meaning, informed by the statutory context.[58] Plain meaning and context, including the well-documented underestimation of subpart W, make clear that the current emission factor-based reporting methodology does not reflect empirical data. [59] "Empirical" means "originating in or based on observation or experience" and "capable of being verified or disproved by observation or experiment."[60] And, "empirical data" or "empirical evidence" means data which "relies on practical experience rather than theories"[61] and is "derived from reliable measurement or observation."[62] Methane emission estimates based on emission factors that numerous field studies have shown are not representative of current conditions do not constitute empirical data within the meaning of the

new statutory provision. Instead, empirical data in the context of subpart W should be understood to mean statistically robust data based on scientifically rigorous measurements of representative sources.

MERP also requires that the revisions ensure reporting accurately reflects total methane emissions from reporting facilities. It requires EPA to "revise the requirements of subpart W...to ensure the reporting under such subpart, and calculation of [the methane waste charge], ... accurately reflect the total methane emissions and waste emissions from the applicable facilities[.]"[63] To accurately calculate "total" emissions from a facility using the best available scientific methods requires taking representative site-level measurements of actual emissions. The site-level estimates can then be used to determine the overall facility emissions. Only when reported emissions closely align with total observed emissions can MERP be accurately implemented.[64]

There is a significant body of scientific evidence based on field observations and measurement data demonstrating that total observed emissions are far higher than emissions currently reported to subpart W and emission inventory estimates. In order for subpart W reporting requirements to be revised consistent with Congress's requirement of accuracy, reported emissions must better align with actual emissions observed in the field. This requires revisions beyond what EPA has proposed thus far.

EPA's proposed updates do include some improvements that would incorporate measurement data, but these changes are modest, voluntary, and do not satisfy the Congressional directive in section 136(h). Accordingly, we respectfully urge EPA to build on its current proposal by issuing a supplemental proposal to revise subpart W more comprehensively, integrating site-level direct measurement data and top-down validation methods.[65] Proceeding in this fashion will best leverage EPA's improvements in the rulemaking already underway and ensure EPA meets Congress's directive to update subpart W by August 2024 at the latest. Below we offer recommendations that could inform a supplemental proposal along these lines.

To ensure reporters accurately estimate total emissions, we recommend that EPA rely on site-level data when updating subpart W to implement MERP. EPA's current approach allows reporters to estimate source level emissions based primarily on engineering calculations and default emission factors. Source-level emission estimates provide valuable information to support regulations mitigating emissions, although they are less useful for estimating total emissions from sites and facilities since many emissions are from abnormal conditions that are difficult to categorize as a specific source. The under-reporting that occurs through the existing source-level-only approach would undermine the effectiveness of MERP, which is consistent with Congress's inclusion of a directive to update subpart W as part of the same bill. EPA should build from and add to its existing approach in a manner that utilizes two additional types of empirical data: scientifically robust site-level measurements of representative sites; and independent emission estimates based on atmospheric observations at the basin or sub-basin level (top-down measurement approaches).

To do this, we recommend a three-step process that is described in more detail below. First, EPA should compile representative site-level measurement data by major production basin. Second, EPA should work with other relevant federal agencies to develop independent, routine, top-down estimates of total emissions by major production basin. And third, EPA should reconcile the two

data sets to generate default site-level emission estimates to be used by reporters for the purposes of implementing MERP. Reporters could also follow EPA-defined protocols for collecting and submitting their own measurement data to demonstrate emissions lower than the site-level defaults.

This multiscale approach will ensure subpart W reporting is accurate, within the meaning of MERP, by not only ensuring that site-level measurements are reconciled to match total regional emissions, but critically that the approach is able to capture changes in emissions over time. As the industry reduces emissions, those reductions will be captured in the GHGRP, which is not currently the case with respect to certain kinds of emission reductions. Such an approach will also incentivize improved methane monitoring and the use of advanced technologies.

Several scientific studies[66] across the oil and gas supply chain have shown that emissions are seldom normally distributed—with a small fraction of sites having a disproportionately large contribution to total emissions. This means that any statistical treatment will need to include sufficient data to accurately account for the characteristics of the "heavy-tailed" emission distribution. Previous studies have demonstrated how site-level measurements can be extrapolated to regional emissions with statistical methods and then reconciled with basin-level top-down data to provide insights into key sources of emissions not previously fully captured in estimates.[67] While these methods will not provide information on the emissions of a particular site at a given time, they do accurately characterize the emissions of a population of sites and so should be the basis for determining "facility" level emissions in subpart W.

EPA's recently proposed updates to subpart W—which preceded the passage of MERP—would revise certain emission factors based on recent studies and create a new category of reported emissions called large release events (those greater than 10 mtCH_4). Characterizing and quantifying emissions from large release events is necessary but not sufficient for accurately estimating total emissions. It is critical that EPA assess whether the emission estimates are accurately and fully capturing both ends of the aggregate emissions distribution. The proposed updates may better characterize the heavy-tailed emission distribution but will miss a significant portion because most of those emissions are not sufficiently large to be reported as "large release events." Until these somewhat smaller but cumulatively very significant emissions are accounted for, the subpart W estimates will not be accurate.

Top-down measurement-based approaches are able to constrain total oil and gas emissions at the regional scale and are readily available for widespread deployment.[68] When performed routinely, they provide the necessary assurance that GHGRP aggregated emissions are accurately capturing all sources of emissions and are also reflecting emissions changes over time. There are also well-established methods of excluding methane emissions from non-oil and gas sources, and deploying these will be important to meeting the criteria for accuracy at varying degrees depending on the oil and gas production basin.

Previous scientific studies have described how site-level data can be statistically aggregated and reconciled with basin-level top-down estimates.[69] Studies have also shown how this multi-scale reconciled data can then be used to assess completeness and improvements to source-level inventories.[70] Discrepancies between bottom-up and top-down estimates provide information about larger uncertainties in terms of magnitude and location of emissions and help identify key sources that require further characterization and attention.[71] This reconciliation is also integral to

meeting the requirements set out under MERP by ensuring the subpart W data is accurate, not systematically skewed as is currently the case. Reconciliation is also necessary to ensure subpart W data is empirically-based to ensure that changes in emissions are rapidly reflected in the reported emissions, unlike the current case where shifts in emissions are largely not included.

Footnotes

[55] Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 60113, https://www.congress.gov/117/bills/hr5376/BILLS-117hr5376enr.pdf.

[56] Id.

[57] See id. at § 136(a)(4) (directing a portion of the $1.55 billion appropriation "to cover all direct and indirect costs required to administer this section, prepare inventories, gather empirical data, and track emissions.").

[58] Kouichi Taniguchi v. Kan Pac. Saipan, Ltd., 566 U.S. 560, 566 (2012).

[59] Alvarez et al., Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain, 361 Science 186 (2018), https://science.sciencemag.org/content/361/6398/186; Rutherford et al., Closing the Methane Gap in US Oil and Natural Gas Production Emissions Inventories, 12 Nature Comms. 4715 (2021), https://www.nature.com/articles/s4 1467-02 1-25017-4#citeas.

[60] Merriam-Webster, Definition of Empirical, https://www.merriam-webster.com/dictionary/empirical.

[61] Collins Dictionary, Empirical Data, https://www.collinsdictionary.com/us/dictionary/english/empirical-data.

[62] Your Dictionary, Empirical Data, https://www.yourdictionary.com/empirical-data. Empiricism is the concept that knowledge is acquired through observation and experience rather than purely through logic.

[63] 42 U.S.C. § 7436(h).

[64] See, *e.g.*, Comment Submitted by Kairos Aerospace, at Figure | (Sept. 15, 2022), Docket No. EPA-HQ-OAR-2019-0424, https://www.regulations.gov/comment/EPA-HO-OAR-2019-0424-0176 (showing large discrepancies in anonymized operator methane intensities calculated using GHGRP data versus aerially observed emissions).

[65] In other areas where the recently-passed Inflation Reduction Act has affected an ongoing rulemaking, EPA has proceeded in similar fashion. See, *e.g.*, David Shepardson, U.S. EPA to consider tougher emissions rules for heavy trucks (Sept. 21, 2022), https://www.reuters.com/business/sustainable-business/exclusive-us-epa-consider-tougheremissions-rules-heavy-trucks-2022-09-21/ (EPA indicated would issue a supplemental proposal to consider the impacts of the IRA on its proposed standards for heavy-duty vehicles and noted that "Congress definitely sent a very strong message backed by significant resources.").

[66] Brandt et al., Methane Leaks from Natural Gas Systems Follow Extreme Distributions (2016), https://pubs.acs.org/doi/10. 102 1/acs.est.6b04303; Gorchov Negron et al., Airborne Assessment of Methane Emissions from Offshore Platforms in the U.S. Gulf of Mexico (2020), https://pubs.acs.org/doi/10. 102 1/acs.est.0c00179; Marchese et al., Methane Emissions from United States Natural Gas Gathering and Processing (2015), https://pubs.acs.org/doi/10.102 l/acs.est.5b02275; von Fischer et al., Rapid, Vehicle-Based Identification of Location and Magnitude of Urban Natural Gas Pipeline Leaks (2017), https://pubs.acs.org/doi/full/10.102 1/acs.est.6b06095; Zavala-Araiza et al., Super-emitters in Natural Gas Infrastructure Are Caused by Abnormal Process Conditions, 8 Nat. Comms. 14012—1421 (2017), https://www.nature.com/articles/ncomms 14012 [hereinafter "Zavala-Araiza 2017").

[67] Alvarez et al., supra note 59; Omara et al., Methane emissions from US low production oil and natural gas well sites, 13 Nat. Comms. 2085 (2022), https://www.nature.com/articles/s4 1467-022-29709-3; Robertson et al., New Mexico Permian Basin Measured Well Pad Methane Emissions Are a Factor of 5—9 Times Higher than U.S. EPA Estimates, 54 Env. Sci. Tech. 13926—13934 (2020), https://pubs.acs.org/doi/abs/10.102 1/acs.est.0c02927; Zavala-Araiza 2017, supra note 66.

[68] Barkley et al., Quantifying methane emissions from natural gas production in north-eastern Pennsylvania (2017) https://doiorg/10.5194/acp-17-13941-2017; Lyon et al., Concurrent Variation in Oil and Gas Methane Emissions and Oil Price During the COVID-19 Pandemic (2021), https://acp.copernicus.org/articles/2 1/6605/2021/; Lin et al., Declining Methane Emissions and Steady, High Leakage Rates Observed over Multiple Years in a Western US oil/gas Production Basin (2022), https://www.nature.com/articles/s4 1598-02 1-01721-5; Karion et al., Aircraft-Based Estimate of Total Methane Emissions from the Barnett Shale Region (2015), https://pubs.acs.org/doi/full/10.102 1/acs.est.5b00217; Peischl et al., Quantifying Atmospheric Methane Emissions from the Haynesville, Fayetteville, and Northeastern Marcellus Shale Gas Production Regions (2015), https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2014JD022697; Shen et al., Satellite Quantification of Oil and Natural Gas Methane Emissions in the US and Canada Including Contributions from Individual Basins (2022), https://acp.copernicus.org/articles/22/11203/2022/; Schwietzke et al., Improved Mechanistic Understanding of Natural Gas Methane Emissions from Spatially Resolved Aircraft Measurements (2017), https://pubs.acs.org/doi/10.102 1/acs.est.7b01810.

[69] Alvarez et al., supra note 59; Zavala-Araiza et al., Toward a Function Definition of Methane Super-Emitters: Application to Natural Gas Production Sites, 49 Env. Sci. Tech. 8167 (2015), https://pubs.acs.org/doi/pdf/10.102 1/acs.est.5b00133.

[70] Rutherford et al., supra note 59; Zavala-Araiza et al., supra note 66.

[71] Alvarez et al., supra note 59; Neininger et al., Coal Seam Gas Industry Methane Emissions in the Surat Basin, Australia: Comparing Airborne Measurements with Inventories (2021), https://royalsocietypublishing.org/doi/10.1098/rsta.2020.0458; Shen et al., Satellite Quantification of Oil and Natural Gas Methane Emissions in the US and Canada Including Contributions from Individual Basins (2022), https://acp.copernicus.org/articles/22/11203/2022/.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 35

Comment Excerpt: To implement the MERP directive, we recommend EPA develop site-level emission factors that would serve as the basis for reporting alongside EPA's existing source-based approach. To ensure these site level estimates are both empirically based and accurately reflect total emissions, we recommend that EPA follow the three-step approach described above and included in more detail below:

1. EPA should oversee the collection of site-level measurement-based estimates. This measurement data must be stratified randomly within regions, industry segments,

operator ownership, and types of sites to ensure representativeness. The number of samples should be sufficient to fully characterize—in the aggregate—the populations of emission sources. EPA must also define what high quality population-level empirical data it will accept. The site-level measurement data should then be used to develop probabilistic, population-based models that characterize the entire emission distribution and extrapolate data to aggregate regional emissions.

2. Independently quantify total oil and gas emissions at the basin/sub-basin level. EPA should work with other federal agencies (*e.g.*, NOAA) to perform, coordinate, and oversee routine top-down measurements covering most oil and gas producing regions that account for the overwhelming majority of oil and gas production. Top-down estimates would have independent utility beyond subpart W, including for the improvement of the Greenhouse Gas Inventory (GHGI). Top-down approaches should be based on a set of previously peer reviewed, scientifically robust approaches including aircraft,[72] towers,[73] and satellites.[74] Top-down approaches should incorporate robust attribution methods[75] that allow for separating emissions between oil and gas and other methane sources.

3. Reconcile the site-level data from (1) with the quantified basin/sub-basin level data from (2). The reconciled data provides new site-level emission factors used by reporters which are then used to implement MERP. Operators are able to submit their own site-level measurement-based data—subject to specific requirements about data quality and previous validation of measurement methods—to prove their company-level facility-based emissions are lower than the population average. Company-submitted data must be considered when the general basin level emission factor is calculated to ensure that there is alignment with the top-down estimates and basin-level accuracy is maintained. In other words, if emission factors for one group of facilities goes down the factors for other facilities must go up to ensure conservation of mass and thereby meet the accuracy requirement.

Our recommendations here also have implications for EPA's source-level estimates. For purposes such as rulemakings that require source-level data, EPA could eventually reconcile the empirical estimates of total emissions derived through the process outlined above with source-level estimates.[76]

Footnotes

[72] See, *e.g.*, Karion et al., supra note 68; Peischl et al., supra note 68; Schwietzke et al., supra note 68.

[73] See, *e.g.*, Monteiro et al., Methane, carbon dioxide, hydrogen sulfide, and isotopic ratios of methane observations from the Permian Basin tower network (2022), https://essd.copernicus.org/articles/14/2401/2022/.

[74] See, *e.g.*, Shen et al., Unravelling a large methane emission discrepancy in Mexico using satellite observations (2021), https://www.sciencedirect.com/science/article/pii/S0034425721001796?via%3Dihub.

[75] Smith et al., Airborne Ethane Observations in the Barnett Shale: Quantification of Ethane Flux and Attribution of Methane Emissions (2015), https://pubs.acs.org/doi/full/10.102 1/acs.est.5b00219.

[76] To do this, EPA could compare estimates of total basin-level emissions based on the current approach of engineering calculations and source-level emission factors to empirically derived estimates. It could then use the empirically derived estimates described in (1) to (3) as the official value for total emissions and assign the difference in emission estimates to a generic source category (*e.g.*, uncategorized). And finally, EPA could assess which source estimates are the likely cause of discrepancies using statistical methods and basin-level comparisons and update source-level methods to increase their accuracy.

Commenter Name: Marcus J. Koblitz, Wendy Kirchoff, and C. Jeffrey Eshelman, II
Commenter Affiliation: American Petroleum Institute (API) American Exploration & Production Council (AXPC) and Independent Petroleum Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0223-A1
Comment Excerpt Number: 5
Speaker Affiliation: API, AXPC, IPAA

Comment Excerpt: Technology to monitor and measure greenhouse gas emissions, especially methane, is advancing rapidly in light of both voluntary efforts to reduce methane emissions from oil and gas operations and new and proposed federal and state policies. As technologies advance, and implementation costs fall, some operators are already deploying these technologies to monitor and quantify emissions which could enhance data accuracy compared to the use of industrial average-based emission factors. Restrictions on the ability to use this data for official reporting may hinder further advancement of these approaches. The oil and natural gas industry has identified methane emissions as a key issue to address, as evidenced by efforts to reduce emissions through voluntary programs like The Environmental Partnership and the OGCI Aiming for Zero Methane Emissions Initiative.

Some operators are already using aerial flyover and satellite data to inform their leak detection and repair approaches, while others have contracted with third party providers to establish on site advanced monitoring and verification programs. Additionally, operators have engaged with programs to develop protocols to calculate measurement-informed estimates of emissions. These efforts may be advanced by the recent passage of the Inflation Reduction Act of 2022, which committed additional funds and focus on advancing these technologies and approaches.

The Industry Trades encourage EPA to immediately start considering how best to integrate pathways to take advantage of the new approaches being developed and deployed by operators. This is an important alternative to the use of industrial average-based emission factors. In this proposal, EPA has indicated a willingness to accept such data under certain circumstances (in the estimation of emissions from "other large events," for instance), we ask that EPA consider expansion of the scope of this approach to other sources in a manner that would not result in duplicative reporting or overly onerous study requirements. Consistent with the recommendation above to delay implementation of revisions under subpart W to ensure alignment with the proposed methane standards, EPA should provide a proposed approach to begin collecting such data now. Those operators who wish to provide such data from efforts already underway could do so, allowing EPA to have a better understanding of the nature of the new data and how that

data can be used in place of traditional emission-factor based estimation. With the requirement under the Inflation Reduction Act of 2022 that EPA revise subpart W again within 2 years to increase the use of "empirical data," allowing for operators to report data from new measurement technologies can provide EPA with greater insight into how that data can be best used. Examples of such opportunities are with respect to the use of fuel gas that does not meet the proposed criteria for reporting under subpart C, as applied to the use of emission factors for combustion in Table W–9 and the use of alternate combustion efficiencies in equations W–39A and W–39B.

In addition to increasing flexibility relating to the use of new technologies for monitoring and measurement, EPA should consider revisions to increase flexibility to reflect the advanced designs often deployed with new facilities. As operators have sought to decrease the potential for methane emissions, many have changed facility designs to remove elements associated with the potential for higher emissions. This includes, for example, the adoption of "tankless" production facilities.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 2

Comment Excerpt: Flexibility in reporting is needed to allow companies to report measured emissions in lieu of using emissions factors. EPA should not mandate that facilities use the agency's emissions factors to report emissions, as it may lead to over reporting of emissions. The agency should allow companies to report measured emissions and provide sufficient planning time so that companies have the option to use measured emissions.

It is also important to allow companies to appropriately differentiate themselves from their sectorial peers. Many companies have made public commitments to reduce their GHG emissions that would demonstrate that they are performing better than the industry average or other value reflected in EPA's emissions factor estimates.

Recent business community comments on EPA's Proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review explain the importance of providing the ability to report measured emissions.[4] The comments stated the following:

"Prescriptive (sometimes called "command-and-control") regulation directs regulated entities to take specific actions. Methane emissions regulations that are too prescriptive can discourage technological advances. For example, current NSPS regulations for stationary sources can require specific methodologies for leak detection and repair ("LDAR") (*e.g.*, Method 21), which do not always provide for the inclusion of technological advancements in the field of leak detection that can develop rapidly and in advance of regulations. Advancements in the use of aircraft surveys, drones, and/or other remote sensing technologies serve to minimize the number of personnel associated with physical, on-site measurement, avoiding the concomitant risks to

safety and health. Performance-based regulation, on the other hand, aligns the interests of asset managers and engineers in the use of technological advances with societal goals to reduce methane emissions because performance-based standards mandate an outcome and encourage regulated entities to employ and develop technological efficiencies that regulators may not anticipate."[5]

If performance-based monitoring requirements are allowed similar to what was described in the above referenced industry comments, it would provide industry the flexibility to use innovative measurement technologies and techniques. These technologies and techniques will continue to evolve. Allowing this flexibility in the GHGRP rule would promote more cost effective and more accurate monitoring and would prevent the regulations from becoming outdated or from requiring the reporting of less precise and less useful data as new technologies are developed. Moreover, in the Inflation Reduction Act (IRA) enacted in August, Congress required EPA to revise Subpart W to allow companies to provide "empirical data" regarding emissions.

Also, companies use their data reported under the EPA GHGRP to demonstrate their progress in meeting certain environmental, social, and government (ESG) goals.[6] If companies are not able to differentiate themselves by measuring their emissions, their compliance alternatives under existing or future regulatory and voluntary programs may require reducing the output or size of their operations as their only cost-effective compliance option.

Footnotes

[4] 86 FR 63110 (November 15, 2021).

[5] Comments of the U.S. Chamber of Commerce. https://www.regulations.gov/comment/EPA-HQ-OAR-2021-0317-0921

[6] For example, many electric utilities have set various levels of carbon-reduction targets from net-negative, 100% renewable, net-zero, to partial GHG reduction. See https://sepapower.org/utility-transformation-challenge/utility1carbon-reduction-tracker/

Commenter Name: Fiji George
Commenter Affiliation: Cheniere Energy, Inc.
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0251-A2
Comment Excerpt Number: 1

Comment Excerpt: We support EPA's efforts to improve the data quality, accuracy and completeness of the GHGRP. We recommend that EPA consider the latest scientific findings and emerging technologies to guide incorporating methane measurements for companies to prepare their emissions inventories.

Cheniere's QMRV R&D program was implemented to develop, field-test, and assess the scale-up potential of three components of a robust methane measurement and mitigation program:

1. the protocol (the methodology to monitor and quantify emissions using measurement);

2. deployment of novel monitoring technologies; and,

3. independent verification.

The first of the QMRV series of papers has been approved through the peer review process[4] and presents important considerations in developing measurement-informed inventories. We hope that this and future findings from our QMRV program will support the EPA's revisions to the GHGRP, and we look forward to continuing to engage by sharing our experiences.

We recommend the EPA employ the framework recommended by National Academies of Sciences to evaluate GHG emissions information, including measurement and associated technology standards.

The National Academies of Sciences recently published a study[5] recommending a framework to evaluate GHG information. The information transparency, validation, and completion pillars recommended in the framework are directly applicable to this rulemaking as the EPA reviews efforts to improve the data quality, accuracy, and completeness of the GHGRP.

Footnotes

[4] Wang JL, Daniels W, Hammerling D, Harrison M, Burmaster K, George F, et al. Multi-scale Methane Measurements at Oil and Gas Facilities Reveal Necessary Framework for Improved Emissions Accounting. Environmental Science & Technology, 2022; DOI: 10.1021/acs.est.2c06211

[5] National Academies of Sciences, Engineering, and Medicine. 2022. Greenhouse Gas Emissions Information for Decision Making: A Framework Going Forward. Washington, DC: The National Academies Press. https://doi.org/10.17226/26641.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 13
Excerpt Status: Not Started

Comment Excerpt: Annual emission inventories, as part of the operating permit programs, and Toxic Release Inventory (TRI) also collected data that was used by industry and others to identify issues and develop responses. USEPA's TRI website (https://www.epa.gov/toxics-release-inventory-tri-program) notes a similar purpose to the GHGRP. As noted on the site:

The Toxics Release Inventory (TRI) is a resource for learning about toxic chemical releases and pollution prevention activities reported by industrial and federal facilities. TRI data supports informed decision-making by communities, government agencies, companies, and others.

Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) created the TRI.

A key difference between these programs and GHGRP is that the GHGRP is overly prescriptive as to how emissions are to be calculated. Under annual emission inventories and TRI, industry determines how best to calculate emissions. This can range from using data from emission monitors, stack testing, engineering calculations, manufacturers' data, or recognized emission factors. The submissions also require a certification by a responsible official. MSC recommends that the GHGRP should follow a similar approach to allow for variations in sources and minimize the reporting burden on the regulated community, while promoting consistency in data that is reported publicly.

Commenter Name: David Callahan
Commenter Affiliation: Marcellus Shale Coalition (MSC)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0199-A1
Comment Excerpt Number: 15
Excerpt Status: Not Started

Comment Excerpt: Pennsylvania has compiled an inventory of emissions since 2012 and expanded the scope of participating facilities and covered equipment over the years. This PADEP emissions inventory includes reporting of methane emissions from Oil and Gas facilities. The MSC believes the revised reporting rule should allow operators the flexibility to use appropriate methodologies based on best available data for determining emissions. As noted above, this approach would be similar to annual emission inventory reporting or TRI reporting. Such methods would include the use of testing, manufacturers' emission estimates, fuel and other related usage rates, and recognized emission factors. These should provide the most accurate emissions summary for the facility per engineering judgement. MSC is also concerned that the level of prescriptiveness in the proposed rule will stifle innovation of new methods for identifying and estimating emissions. Both annual emission inventories and TRI reporting were put in place to determine current emissions and recognize opportunities for improvement. MSC believes the intent for the GHG reporting rule is the same.

Commenter Name: Matthew Hite
Commenter Affiliation: GPA Midstream Association
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0192-A1
Comment Excerpt Number: 9

Comment Excerpt: In the past, GPA has generally advocated for simple emission factors for calculating emissions under the GHGRP rather than reliance on direct measurements. However,

as companies look for new ways to reduce greenhouse gas emissions, and as companies seek to fine tune their reported emissions accordingly, EPA could best fulfill the purposes of the GHGRP by allowing more methods by which reporters can determine emissions. Most reporters have been submitting GHG reports to EPA for at least 6 years (G&B), if not 12 years (Plants), and GHG reporting programs have come a long way in their maturity. As such, EPA should consider ways to move away from a reporting regime focused on consistent calculation methods among reporters and move toward a reporting regime focused on improving the accuracy of reported emissions. EPA should consider moving toward a "hierarchy" of calculation methods, like how many states structure criteria pollutant emission inventory calculation requirements. This also aligns with the directive in the Inflation Reduction Act to ensure reported emissions are based on empirical data and accurately reflect total emissions. GPA welcomes the opportunity to continue discussions with EPA in this regard and encourages EPA to use this rulemaking as an opportunity to gather additional information that will make such a reporting program possible.

Commenter Name: Dan Naatz
Commenter Affiliation: Independent Petroleum Association of America (IPAA)
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0230-A1
Comment Excerpt Number: 7

Comment Excerpt: More importantly, as the EPA moves into developing the revisions to Subpart W and framing its methane tax regulations, it needs to assure that alternative emissions calculations are allowed under the methane tax. Moreover, there needs to be a process to sanction alternative calculation approaches such that the mere use of an alternative does not become the basis for an OECA audit. In the context of the GHGI, these differences are a somewhat academic exercise. But, the IRA has changed the issue. When it becomes effective, these calculations will determine the amount of methane tax that must be paid. Equally, and perhaps more importantly, they will be subject to audit by EPA and potential enforcement actions with daily fines that far exceed the methane tax. For example, determining leaking and normal operating controllers will be a threshold issue. The use of alternative calculations would be another.

Commenter Name: Not provided
Commenter Affiliation: Exelon
Commenter Type: Industry
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0209-A1
Comment Excerpt Number: 7

Comment Excerpt: Introduce direct measurement as an alternative to emissions factors -EPA should allow for, but not require, direct measurement options as an alternative to emissions

factors. Exelon is supportive of an option for using direct measurements to develop company/utility-level emissions quantification for reporting under Subpart W, and we are exploring direct measurement techniques for our own systems. However, techniques and protocols are still in development and many related technologies are still relatively costly and sophisticated compared with the traditional leak detection and emissions factor method. Direct measurement is best introduced as an option rather than a requirement at this time.

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 14

Comment Excerpt: EPA should allow for direct measuring options as an alternative to emissions factors —There are various industry standards bodies that develop consensus and other types of methods for emissions measurement and verification. For example, GTI Energy is working with experts from industry, academia, and non-governmental organizations to develop consensus protocols for methane measurement and verification for each segment of the natural gas supply chain. They expect to release the "Veritas" protocols at the end of 2022 to help inform EPA.[19] EPA should provide the option for utilizing direct measurements and company specific data in lieu of relying on or supplementing the use of EPA's default emission factors.

Footnotes

[19] The segment-specific Veritas Measurement Protocols are intended to provide a framework for quantitative measurement of methane emissions from sources and discrete sites within each segment of the natural gas value chain from production through distribution. Whole site, whole system, and focused methane measurement technologies are evolving rapidly, and the measurement protocols are not prescriptive in terms of the measurement technologies to be deployed. The Veritas protocols were developed to help reconcile measured emissions with emission factor-based inventories. https://www.gti.energy/veritas-a-gti-methane-emissions- measurement-ana-verification-initiative/

Commenter Name: Not provided
Commenter Affiliation: American Chemistry Council et al.
Commenter Type: Industry Trade Association
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0244-A1
Comment Excerpt Number: 15

Comment Excerpt: EPA should allow for direct measuring options, but should not be mandatory. There are some challenging applications where it would be cost prohibitive or infeasible to directly monitor GHG emissions. For example, the concept of continuous emissions monitoring as used for "facilities" is not applicable to linear, non-discrete assets like natural gas

or liquid distribution systems. It is not possible to directly measure through continuous emissions monitors the thousands of miles of natural gas pipelines. Additionally, there may be more cost-effective alternatives to continuous monitoring such as more frequent inspection and leak repair in cases where facilities have no vented emissions sources. For facilities without vented emissions, continuous monitoring is expensive to install and maintain and is often not cost effective from an emissions abatement perspective. In populated operating environments, high incident rates of false positives can also significantly increase operational costs, giving rise to our recommendation to allow, but not make mandatory, direct emissions measurement.

Commenter Name: Edwin LaMair, Elena Malik, Peter Zalzal, David Lyon, Jack Warren, Nichole Saunders, and Jona Koka
Commenter Affiliation: Environmental Defense Fund (EDF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0241-A1
Comment Excerpt Number: 36

Comment Excerpt: Emission estimates derived from data reported through subpart W have traditionally lead to significant underestimation of total emissions from the oil and gas sector, with the greatest divergence in the production segment.[77,78] A large body of peer-reviewed literature has documented this failure to fully capture emissions over the past decade, primarily attributing the divergence to the GHGRP and Greenhouse Gas Inventory's (GHGI) failure to account for intermittent, large emission events. These emissions, often termed "super emitters," are commonly caused by abnormal process conditions and equipment failures. Super-emitters lead to a heavy-tailed emission distribution, where the top 5-10% of sites or components are responsible for around 50% of total emissions.

Super-emitters are generally considered within the category of fugitive emissions, but they are distinct due to their root causes, large magnitude, and stochasticity. Fugitive emissions are emissions that are not intended as part of normal operations and can be broadly classified as leaks and unintentional vents. Sources of fugitive emissions include valves, flanges, connectors, thief hatches of controlled tanks, pump diaphragms, seals, and open-ended lines, and many others. Causes of these emissions include persistent issues, Such as equipment malfunctions (*e.g.*, unlit flare), as well as intermittent, short duration events (*e.g.*, flashing from condensate tanks with malfunctioning controls).[79] Fugitive emissions can also result from devices that vent as part of normal operations, such as natural-gas driven pneumatic controllers, and control devices or equipment combusting natural gas, such as flares, when those devices are not operating as intended and have abnormally high emission rates. Fugitive emissions that result from abnormal operating conditions or equipment failures and result in large emission events are termed "super-emitters."

Super-emitters are often not well-represented (and may not be represented at all) in official estimates and inventories because they can be intermittent and are easily missed when taking equipment- or component level measurements.[80] Because of this, emission factors derived from such measurements that do not otherwise account for super-emitters are not representative of

total observed emissions. Bottom-up methods that estimate emissions using component or equipment counts and emission factors often fail to account for super-emitter events and result in artificially low overall emission estimates. Bottom-up methods often rely on measurements that capture only a snapshot of time; therefore, they may not be representative of emissions over longer timescales and are likely to miss intermittent emissions. Additionally, emission estimates that rely on engineering calculations often fail to account for super-emitters because the data inputs assume normal operations. Aerial detection methods and other top-down measurement and quantification techniques have documented the significance of large emission events and their large contribution to total emissions. This well-documented, heavy-tailed emission distribution means that 5- 10% of sites are often responsible for 50% or more of total emissions.

Over the last decade, research by EDF and others has quantified the significance of methane emissions caused by oil and gas production and the persistent underestimation of fugitive and abnormal process emissions.[81] A large body of measurement-based studies has consistently found higher oil and gas methane emissions than are reflected in most inventories.[82] Bottom-up approaches like the EPA inventory and the subpart W reporting protocols greatly underestimate emissions because they are based on assumptions that do not account or large events caused by malfunctions and other abnormal conditions.[83] Accounting for these emission events can increase inventory estimates by 60-70%, underscoring the importance of accurate reporting protocols that capture such emissions.[84]

In 2012, EDF launched a series of research studies to quantify methane emissions from the U.S. oil and gas supply chain with diverse, measurement-based methodologies.[85] This collaborative work with over one hundred and forty experts from academia, industry, and government has resulted in more than forty peer reviewed papers. In 2018, Alvarez et al., synthesized previous studies to estimate that U.S. oil and gas supply chain methane emissions were 13 million metric tons in 2015, equivalent to 2.3% of natural gas production and about 70% higher than estimated by EPA's current GHGI.[86] Numerous other studies have confirmed that bottom-up approaches like the GHGI and the subpart W reporting protocols greatly underestimate oil and gas methane emissions, largely capturing only component-level leaks and often missing the largest emission events.[87]

[See DCN EPA-HQ-OAR-2019-0424-0241-A1, pg. 24, for Figure 2: Alvarez Synthesis Model Inventory Estimates][88]

Recent research has found several common characteristics of oil and gas industry methane emissions. First, emissions occur across the value chain from well to end use, but are concentrated in the production and gathering segments, including well pads, tank batteries, and gathering compressor stations. EDF's emission inventory (shown above), derived from the Alvarez synthesis model and using more recent activity data,[89] estimates that production segment fugitive emissions represent nearly 50% of all oil and gas sector methane emissions. Second, all oil and gas facility types have a skewed distribution in which 5-10% of the highest emitting sites are responsible for about half of total emissions; however, the identity of these high-emitting sites can change with time and is difficult to predict.[90] Third, low production or marginal wells tend to have lower absolute emissions than high production wells, but much higher loss rates as a percentage of gas production. And because roughly three quarters of all wells are marginal, they cumulatively contribute a substantial fraction to total emissions—around 50% of production sector emissions according to a recent study.[91] Fourth, emissions can almost always be mitigated

once detected, sometimes with a simple repair to stop a leak, and other times by implementing operational or equipment changes that improve a site's efficiency.

EDF's Permian Methane Analysis Project (PermianMAP) uses several peer-reviewed measurement approaches to quantify oil and gas methane emissions in the Permian Basin, the nation's largest oil field, and then posts the emissions data on the public website PermianMAP.org to facilitate mitigation. This project and other recent research in the Permian basin have generated several important findings, which we briefly summarize here.

Zhang et al. in a 2020 paper estimate the Permian Basin loss rate is 3.7% of gas production, substantially higher than the national average.[92] In 2021, Lyon et al., found a similar loss rate of 3.3% in the core production area of the Delaware sub-basin in March 2020 using aircraft and tower-based measurements. Lyon et al. report that the loss rate temporarily dropped to 1.9% in April 2020 when oil prices declined but recovered to prior levels by summer 2020.[93] They hypothesize that the Permian Basin typically has a high loss rate because wells are developed faster than the pipelines and compressor stations needed to transport the gas to market. This leads to both high rates of associated gas flaring and abnormal emissions due to gathering systems with inadequate capacity. The decline in well development during low oil prices likely temporarily relieved capacity issues and reduced emissions, bringing the leak rate closer to but still higher than EPA inventory estimates. This study suggests that permanent reductions could be achieved by ensuring adequate gathering infrastructure before permitting new well development.

Robertson et al. in a 2020 paper determined that New Mexico Permian well pad emissions were five to nine times higher than EPA inventory estimates; complex pads including tanks or compressors had about twenty times higher average emissions than simple pads with only a wellhead.[94] Finally, Cusworth et al. in 2021 used an aerial remote sensing approach to quantify over 1,100 large methane sources in the Permian.[95] In support of previous research, the paper found that both the gathering sector and flares are large sources of emissions. They also assess the intermittency of large sources and determine that, on average, large emission sources are emitting 26% of the time.

In addition to quantifying methane emissions, EDF scientists have assessed flare performance in the Permian with a series of helicopter-based infrared camera surveys. Based on over one thousand flare observations, approximately 5% of large flares are unlit and venting gas at any given time, and another 5% have visible slip of methane or other hydrocarbons—meaning the flare is only partially combusting the methane and the rest is escaping to the atmosphere. On-the-ground flare combustion efficiency is thus much worse than EPA has assumed and than regulatory standards require. Flares are consequently one of the largest sources of methane in the Permian Basin, and the latest surveys have found even worse performance among smaller, intermittent flares.[96] These findings suggest that reported flare emission estimates are likely far lower than actual emissions.

Studies examining emissions from low-producing or marginal wells—those that produce an average of less than 15 BOE/day—find even greater leak rates. And because there are hundreds of thousands of these sites nationwide, the cumulative emissions are very problematic and may represent more than half of total production-segment emissions.[97] In West Virginia, researchers found that wellhead methane emissions from marginal wells were 7.5 times larger than EPA's

inventory estimate, with an average methane loss rate of 8.8% of production leaked at the wellhead.[98] In the Appalachian Basin, researchers reported that marginal well sites in Pennsylvania and West Virginia have enormously varied methane loss rates, ranging anywhere from 0.35% to 91% of their production.[99] For the very low production category of 0-1 BOE/day wells, which contribute just 0.2% and 0.4% of national oil and gas production, respectively, researchers in the Appalachian Basin estimated that wellhead methane emissions account for 11% of the production related methane emissions in the EPA's inventory.[100] The same research observed that many marginal wells emit as much or more gas than they reported producing—in a region where natural gas is the primary product operators are aiming to sell.

The scientific understanding of oil and gas methane emissions has expanded greatly over the last decade and can inform improved reporting requirements and effective regulations for reducing emissions, especially fugitive monitoring programs. The science shows that due to the skewed distribution of emission rates and the intermittency of some large emission events, emission factors that do not account for this using statistical methods or are not operationally verified with large-scale, frequent measurement efforts will greatly underestimate total emissions. These studies highlight the importance of updating subpart W reporting methodologies to bring reported and estimated emissions into better alignment with observed emissions.

Footnotes

[77] The remaining portions of our comments on subpart W were developed in collaboration with Clean Air Task Force and contain similar recommendations.

[78] See, *e.g.*, Alvarez et al., supra note 59; Rutherford et al., supra note 59.

[79] Zavala-Araiza et al., Toward a Function Definition of Methane Super-Emitters: Application to Natural Gas Production Sites, 49 Env. Sci. Tech. 8167 (2015), https://pubs.acs.org/doi/pdf/10.102 1/acs.est.Sb00133.

[80] See IEA, Methane Tracker Database (Oct. 2021), https://www.iea.org/articles/methane-tracker-database (summary of inventory estimates).

[81] EDF, Methane Research Series: 16 Studies, https://www.edf.org/climate/methane-research-series-16-studies.

[82] Lyon et al., Concurrent Variation, supra note 68; Zavala-Araiza et al., Reconciling Divergent Estimates of Oil and Gas Methane Emissions, 112 Proc. Natl. Acad. Sci. 15597-15602 (2015), https://www.pnas.org/doi/abs/10.1073/pnas. 1522126112; Zavala-Araiza et al., supra note 66; Zimmerle et al., Methane Emissions from the Natural Gas Transmission and Storage System in the United States, 49 Env. Sci. Tech. 9374-9383 (2015), https://pubs.acs.org/doi/10.1021/acs.est.5b01669; Omara et al., Methane Emissions from Conventional and Unconventional Natural Gas Production Sites in the Marcellus Shale Region, 50 Env. Sci. Tech.2099—2107 (2016), https://pubs.acs.org/doi/10.102 1/acs.est.5b05503; Peischl et al., supra note 68; Caulton et al., Importance of Superemitter Natural Gas Well Pads in the Marcellus Shale, 53 Env. Sci. Tech. 4747—4754 (2019), https://pubs.acs.org/doi/10. 102 1/acs.est.8b06965; Robertson et al., supra note 67; Zhang et al., Quantifying Methane Emissions from the Largest Oil-producing Basin in the United States from Space, 6 Sci. Adv. 5120 (2020), https://advances.sciencemag.org/content/6/17/eaaz5 120/tab-pdf; Lyon et al., Concurrent Variation, supra note 68.

[83] Rutherford et al., supra note 59.

[84] Alvarez et al., supra note 59.

[85] See EDF, Methane research series: 16 studies, https://www.edf.org/climate/methane-research-series-16-studies.

[86] Alvarez et al., supra note 59.

[87] See, *e.g.*, Rutherford et al., supra note 59.

[88] For an explanation of the methodology used to create this inventory, see EDF, 2019 U.S. Oil & Gas Methane Emissions Estimate, http://blogs.edf.org/energyexchange/files/202 1/04/2019-EDF-CH4-Estimate.pdf

[89] EDF, 2019 U.S. Oil & Gas Methane Emissions Estimate, http://blogs.edf.org/energyexchange/files/2021/04/2019-EDF-CH4-Estimate.pdf; see also IEA, Methane Tracker Database (Oct. 2021), https://www.iea.org/articles/methane-tracker-database (summarizing and comparing various inventory estimates).

[90] Lyon et al., Aerial Surveys of Elevated Hydrocarbon Emissions from Oil and Gas Production Sites, 50 Env. Sci. Tech. 4877 (2016), https://pubs.acs.org/doi/full/10.1021/acs.est.6b00705.

[91] Omara et al., Methane Emissions from US Low Production Oil and Natural Gas Well Sites, 13 Nat. Comms. 2085 (2022), https://www.nature.com/articles/s41467-022-29709-3; see also EDF, Marginal Well Factsheet (2021), https://www.edf.org/sites/default/files/documents/MarginalWellFactsheet20210.pdf.

[92] Zhang et al., supra note 82.

[93] Lyon et al., Concurrent Variation, supra note 68.

[94] Robertson et al., supra note 67.

[95] Cusworth et al., Intermittency of Large Methane Emitters in the Permian Basin, Envtl. Sci. Tech. Letters __(2021), https://pubs.acs.org/doi/abs/10.1021/acs.estlett.1c00173.

[96] See Attachment A (PermianMAP November 2021 Flyover Results).

[97] Omara et al., Methane emissions from US low production oil and natural gas well sites, 13 Nat. Comms. 2085 (2022), https://www.nature.com/articles/s4 1467-022-29709-3.

[98] Riddick et al., Measuring Methane Emissions from Abandoned and Active Oil and Gas Wells in West Virginia, 651, Sci. of the Total Env. 1849 (2019), https://doi.org/10.1016/j.scitotenv.2018.10.082.

[99] Omara et al., Methane Emissions from Conventional and Unconventional Natural Gas Production Sites in the Marcellus Shale Basin, 50 Env. Sci. Tech. 2099 (2016), https://pubs.acs.org/doi/10.1021/acs.est.Sb05503.

[100] Deighton et al., Measurements Show that Marginal Wells are a Disproportionate Source of Methane Relative to Production, 70 J. Air & Waste Mgmt. Assn. 1030 (2020), https://doi.org/10.1080/10962247.2020.1808115.

Commenter Name: Alan Masinter
Commenter Affiliation: Clean Air Task Force (CATF)
Commenter Type: Environmental Organization
Comment Phase: Initial
Document Control Number: EPA-HQ-OAR-2019-0424-0248-A1
Comment Excerpt Number: 8

Comment Excerpt: Emission estimates derived from data reported through the GHGRP have traditionally been inaccurate and lead to significant underestimation of total emissions from the oil and gas sector, with the greatest divergence in the production segment.[15] A large body of peer-reviewed literature has documented this problem over the past decade, primarily attributing the divergence to the GHGRP and GHGI's failure to account for intermittent, large emission events. These emissions, often termed "super-emitters," are commonly caused by abnormal process conditions and equipment failures. Super-emitters lead to a fat-tailed emission distribution, where the top 5-10% of sites or components are responsible for around 50% of total emissions.

Super-emitters are generally considered within the category of fugitive emissions, but they are distinct due to their root causes, large magnitude, and stochasticity. Fugitive emissions are emissions that are not intended as part of normal operations and can be broadly classified as leaks and unintentional vents. Sources of fugitive emissions include valves, flanges, connectors, thief hatches of controlled tanks, pump diaphragms, seals, and open-ended lines, and many others. Causes of these emissions include persistent issues, such as equipment malfunctions (*e.g.*, unlit flare), as well as intermittent, short duration events (*e.g.*, flashing from condensate tanks with malfunctioning controls).[16] Fugitive emissions can also result from devices that vent as part of normal operations, such as natural-gas driven pneumatic controllers, and control devices or equipment combusting natural gas, like flares, when those devices are not operating as intended and have abnormally high emission rates. Fugitive emissions that result from abnormal operating conditions or equipment failures and result in large emission events are often termed "super-emitters."

Super-emitters are often not well-represented (and may not be represented at all) in official inventories because they can be intermittent and are easily missed when taking equipment- or component-level measurements. [17] Because of this, emission factors derived from such measurements that do not otherwise account for super-emitters are not representative of observed emissions. Bottom-up methods that estimate emissions using component or equipment counts and emission factors often fail to account for super-emitter events and result in artificially low overall emission estimates. Bottom-up methods often rely on measurements that capture only a snapshot of time; therefore, they may not be representative of emissions over longer timescales and are likely to miss intermittent emissions. Additionally, emission estimates that rely on engineering calculations often fail to account for super-emitters because the data inputs assume normal operations. Aerial detection methods and other top-down measurement and quantification techniques have documented the significance of large emission events and their large contribution to total emissions. This well-documented, fat-tailed emission distribution means that 5-10% of sites are often responsible for 50% or more of total emissions.

Over the last decade, research by EDF and others has quantified the significance of methane emissions caused by oil and gas production and the persistent underestimation of fugitive and abnormal process emissions.[18] A large body of measurement-based studies have consistently found higher oil and gas methane emissions than is reflected in EPA inventories.[19] Bottom-up approaches like the EPA inventory and the Subpart W reporting protocols greatly underestimate emissions because they are based on assumptions that do not account for large events caused by malfunctions and other abnormal conditions.[20] Accounting for these emission events can increase inventory estimates by 60-70%, underscoring the importance of accurate reporting protocols that capture such emissions.[21]

[See DCN EPA-HQ-OAR-2019-0248-A1, pg. 9, for Figure 1: Alvarez Synthesis Model Inventory Emission Estimates (2019).[22]]

In 2012, EDF launched a series of research studies to quantify methane emissions from the U.S. oil and gas supply chain with diverse, measurement-based methodologies.[23] This collaborative work with over one hundred and forty experts from academia, industry, and government has resulted in more than forty peer-reviewed papers. In 2018, Alvarez et al., synthesized previous studies to estimate that U.S. oil and gas supply chain methane emissions were 13 million metric tons in 2015, equivalent to 2.3% of natural gas production and about 70% higher than estimated by EPA's current GHGI.[24] Numerous other studies have confirmed that bottom-up approaches like the GHGI and the Subpart W reporting protocols greatly underestimate oil and gas methane emissions, largely capturing only component-level leaks and often missing the largest emission events.[25]

[See DCN EPA-HQ-OAR-2019-0248-A1, pg. 10, for Figure 2: IEA Comparison of Emission Inventory Estimates.]

Recent research has found several common characteristics of oil and gas industry methane emissions. First, emissions occur across the value chain from well to end use, but are concentrated in the production and gathering segments, including well pads, tank batteries, and gathering compressor stations. EDF's emission inventory for 2019, derived from the Alvarez synthesis model and using more recent activity data,[26] estimates that production segment fugitive emissions represent nearly 50% of all oil and gas sector methane emissions. Second, all oil and gas facility types have a skewed distribution in which 5-10% of the highest emitting sites are responsible for about half of total emissions; however, the identity of these high-emitting sites can change with time and is difficult to predict.[27] Third, low production or marginal wells tend to have lower absolute emissions than high production wells, but much higher loss rates as a percentage of gas production. And because roughly three quarters of all wells are marginal, they cumulatively contribute a substantial fraction of total emissions–up to 50% of production sector emissions according to a recent study.[28] Fourth, emissions can almost always be mitigated once detected, sometimes with a simple repair to stop a leak and other times by implementing operational or equipment changes that improve a site's efficiency.

EDF's Permian Methane Analysis Project (PermianMAP) uses several peer-reviewed measurement approaches to quantify oil and gas methane emissions in the Permian Basin, the nation's largest oil field, and then posts the emissions data on the public website PermianMAP.org to facilitate mitigation. This project and the associated studies have generated several important findings, which we briefly summarize here.

Zhang et al., in a 2020 paper, estimate the Permian Basin loss rate is 3.7% of gas production, substantially higher than the national average.[29] In 2021, Lyon et al. found a similar loss rate of 3.3% in the core production area of the Delaware sub-basin in March 2020 using aircraft and tower-based measurements. The paper reports that the loss rate temporarily dropped to 1.9% in April 2020 when oil prices declined but recovered to prior levels by summer 2020.[30] The authors hypothesize that the Permian Basin typically has a high loss rate because wells are developed faster than the pipelines and compressor stations needed to transport the gas to market. This leads to both high rates of associated gas flaring and abnormal emissions due to gathering systems with inadequate capacity. The decline in well development during low oil prices likely

temporarily relieved capacity issues and reduced emissions, bringing the leak rate closer to but still higher than EPA inventory estimates. This study suggests that permanent reductions could be achieved by ensuring adequate gathering infrastructure before permitting new well development.

Robertson et al. in a 2020 paper determined that New Mexico Permian well pad emissions were five to nine times higher than EPA inventory estimates; complex pads including tanks or compressors had about twenty times higher average emissions than simple pads with only a wellhead.[31] Finally, Cusworth et al. in 2021 used an aerial remote sensing approach to quantify over 1,100 large methane sources in the Permian.[32] In support of previous research, the paper found that both the gathering sector and flares are large sources of emissions. They also assess the intermittency of large sources and determine that, on average, large emission sources are emitting 26% of the time.

In addition to quantifying methane emissions, EDF scientists have assessed flare performance in the Permian with a series of helicopter-based infrared camera surveys. Based on over one thousand flare observations, approximately 5% of large flares are unlit and venting gas at any given time, and another 5% have visible slip of methane or other hydrocarbons–meaning the flare is only partially combusting the methane and the rest is escaping to the atmosphere. On-the-ground flare combustion efficiency is thus much worse than EPA has assumed and than regulatory standards require. Flares are consequently one of the largest sources of methane in the Permian Basin, and the latest surveys have found even worse performance among smaller, intermittent flares.[33] These findings suggest that reported flare emission estimates are likely far lower than actual emissions.

Studies examining emissions from low-producing or marginal wells—those that produce an average of less than 15 BOE/day—find even greater leak rates. And because there are hundreds of thousands of these sites nationwide, the cumulative emissions are very problematic and represent more than half of total production-segment emissions.[34] In West Virginia, researchers found that wellhead methane emissions from marginal wells were 7.5 times larger than EPA's inventory estimate, with an average methane loss rate of 8.8% of production leaked at the wellhead.[35] In the Appalachian Basin, researchers reported that marginal well sites in Pennsylvania and West Virginia have enormously varied methane loss rates, ranging anywhere from 0.35% to 91% of their production.[36] For the very low production category of 0-1 BOE/day wells, which contribute just 0.2% and 0.4% of national oil and gas production, respectively, research in the Appalachian Basin estimated that wellhead methane emissions account for 11% of the production-related methane emissions in the EPA's inventory.[37] The same research observed that many marginal wells emit as much or more gas than they reported producing—in a region where natural gas is the primary product operators are aiming to sell.

The scientific understanding of oil and gas methane emissions has expanded greatly over the last decade and can inform improved reporting requirements and effective regulations for reducing emissions, especially fugitive monitoring programs. The science shows that due to the skewed distribution of emission rates and the intermittency of some large emission events, emission factors that do not account for this using statistical methods or are not operationally verified with large-scale, frequent measurement efforts will greatly underestimate total emissions. These studies highlight the importance of updating Subpart W reporting methodologies to bring reported and estimated emissions into better alignment with observed emissions.

Footnotes

[15] See, *e.g.*, Ramón A. Alvarez et al., Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain, 361 Science 186 (2018), https://science.sciencemag.org/content/361/6398/186; Jeffrey S. Rutherford et al., Closing the methane gap in US oil and natural gas production emissions inventories, 12 Nature Commc'ns 4715 (2021), https://www.nature.com/articles/s41467-021-25017-4.

[16] Daniel Zavala-Araiza et al., Toward a Function Definition of Methane Super-Emitters: Application to Natural Gas Production Sites, 49 Env't Sci. Tech. 8167 (2015), https://pubs.acs.org/doi/pdf/10.1021/acs.est.5b00133.

[17] See IEA, Methane Tracker Database (October 2021), https://www.iea.org/articles/methane-tracker-database (summary of inventory estimates).

[18] EDF, Methane research series: 16 studies, https://www.edf.org/climate/methane-research-series-16-studies (last visited Oct. 6, 2022).

[19] David R. Lyon et al., Constructing a spatially resolved methane emission inventory for the Barnett Shale region, 49 Env't Sci. Tech. 8147 (2015), https://pubs.acs.org/doi/full/10.1021/es506359c; Daniel Zavala-Araiza et al., Reconciling divergent estimates of oil and gas methane emissions, 112 Proc. Nat'l Acad. Sci. 15597 (2015), https://www.pnas.org/doi/abs/10.1073/pnas.1522126112; Daniel Zavala-Araiza et al., Super-emitters in natural gas infrastructure are caused by abnormal process conditions, 8 Nat'l Commn's. 14012 (2017) [hereinafter Zavala1Araiza et al., Super-emitters], https://www.nature.com/articles/ncomms14012; Daniel J. Zimmerle et al., Methane emissions from the natural gas transmission and storage system in the United States, 49 Env't Sci. Tech. 9374 (2015), https://pubs.acs.org/doi/10.1021/acs.est.5b01669; Mark Omara et al., Methane emissions from conventional and unconventional natural gas production sites in the Marcellus Shale region, 50 Env't Sci. Tech. 2099 (2016) [hereinafter Omara et al., Marcellus Shale], https://pubs.acs.org/doi/10.1021/acs.est.5b05503; Jeff Peischl et al., Quantifying atmospheric methane emissions from Haynesville, Fayetteville, and northeastern Marcellus shale gas production regions, 120 J. Geo. Res. Atmospheres 2119 (2015), https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2014JD022697; Dana R. Caulton et al., Importance of superemitter natural gas well pads in the Marcellus Shale, 53 Env't Sci. Tech. 4747 (2019), https://pubs.acs.org/doi/10.1021/acs.est.8b06965; Anna M. Robertson et al., New Mexico Permian Basin measured well pad methane emissions are a factor of 5—9 times higher than U.S. EPA estimates, 54 Env't Sci. Tech. 13926(2020), https://pubs.acs.org/doi/abs/10.1021/acs.est.0c02927; Yuzhong Zhang et al., Quantifying methane emissions from the largest oil-producing basin in the United States from space, 6 Sci. Advances 5120 (2020), https://advances.sciencemag.org/content/6/17/eaaz5120/tab-pdf; David R. Lyon et al., Concurrent variation in oil and gas methane emissions and oil price during the COVID-19 pandemic, 21 Atmos. Chem. Phys. 6605 (2021) [hereinafter Lyon et al., Concurrent variation] https://acp.copernicus.org/articles/21/6605/2021/acp-21-6605- 2021.html.

[20] Rutherford et al., supra, note 15.

[21] Alvarez, supra, note 15.

[22] For an explanation of the methodology used to create this inventory, see EDF, 2019 U.S. Oil & Gas Methane Emissions Estimate (2020), http://blogs.edf.org/energyexchange/files/2021/04/2019-EDF-CH4-Estimate.pdf.

[23] See Environmental Defense Fund, Methane research series: 16 studies, https://www.edf.org/climate/methane-research-series-16-studies.

[24] Alvarez, supra, note 15

[25] See, *e.g.*, Rutherford et al., supra note 15.

[26] EDF, 2019 U.S. Oil & Gas Methane Emissions Estimate, http://blogs.edf.org/energyexchange/files/2021/04/2019- EDF-CH4-Estimate.pdf.

[27] David R. Lyon, et al., Aerial Surveys of Elevated Hydrocarbon Emissions from Oil and Gas Production Sites, 50 Env't Sci. Tech. 4877 (2016) [hereinafter Lyon et al., Aerial Surveys] https://doi.org/10.1021/acs.est.6b00705.

[28] Omara et al., Marcellus Shale, supra note 19; see also Environmental Defense Fund, Marginal Well Factsheet (2021), https://www.edf.org/sites/default/files/documents/MarginalWellFactsheet2021_0.pdf.

[29] Zhang et al., supra note 19.

[30] Lyon et al., Concurrent variation, supra, note 19.

[31] Robertson et al., supra note 19.

[32] Daniel Cusworth et al., Intermittency of Large Methane Emitters in the Permian Basin, 8 Env't. Sci. Tech. Letters 567 (2021), https://pubs.acs.org/doi/abs/10.1021/acs.estlett.1c00173.

[33] Environmental Defense Fund, Permian Methane Analysis Project, https://data.permianmap.org/pages/operators (November 2021 Flyover Results).

[34] Mark Omara et al., Methane emissions from US low production oil and natural gas well sites, 13 Nature Commc'ns 2085 (2022) [hereinafter Omara et al., gas well cites], https://doi.org/10.1038/s41467-022-29709-3.

[35] Stuart N. Riddick et al., Measuring methane emissions from abandoned and active oil and gas wells in West Virginia, 651 Sci. Total Env't 1849 (2019), https://doi.org/10.1016/j.scitotenv.2018.10.082.

[36] Omara et al., Marcellus Shale, supra note 19.

[37] Jacob Deighton et al., Measurements show that marginal wells are a disproportionate source of methane relative to production, 70 J. Air & Waste Mgmt. Assn. 1030 (2020), https://doi.org/10.1080/10962247.2020.1808115.