

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 98

[EPA-HQ-OAR-2012-0934; FRL-9902-95-OAR]

RIN 2060-AR52

2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantially Revised Data Elements

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The EPA is amending the Greenhouse Gas Reporting Rule to implement technical corrections, clarifying revisions, and other amendments to improve the quality and consistency of the data collected by the EPA. Among other changes, the EPA is amending the Rule’s table of global warming potentials to revise the values for certain greenhouse gases. This action also establishes confidentiality determinations for the reporting of new or substantially revised data elements (i.e., requiring additional or different data to be reported) contained in these

final amendments to the Greenhouse Gas Reporting Rule.

DATES: This final rule is effective on January 1, 2014.

ADDRESSES: All documents in the docket are listed in the <http://www.regulations.gov> index. Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in <http://www.regulations.gov> or in hard copy at the Air Docket, EPA/DC, William Jefferson Clinton Building (WJC) West Building, Room 3334, 1301 Constitution Ave. NW., Washington, DC. This Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744 and the telephone number for the Air Docket is (202) 566-1742.

FOR FURTHER GENERAL INFORMATION CONTACT: Carole Cook, Climate Change Division, Office of Atmospheric Programs (MC-6207J), Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460;

telephone number: (202) 343-9263; fax number: (202) 343-2342; email address: GHGReportingRule@epa.gov. For technical information, please go to the Greenhouse Gas Reporting Rule Program Web site <http://www.epa.gov/ghgreporting/index.html>. To submit a question, select Rule Help Center, followed by Contact Us.

Worldwide Web (WWW). In addition to being available in the docket, an electronic copy of this final rule will also be available through the WWW. Following the Administrator’s signature, a copy of this action will be posted on EPA’s greenhouse gas reporting rule Web site at <http://www.epa.gov/ghgreporting/index.html>.

SUPPLEMENTARY INFORMATION:

Regulated Entities. The Administrator determined that this action is subject to the provisions of Clean Air Act (CAA) section 307(d). See CAA section 307(d)(1)(V) (the provisions of CAA section 307(d) apply to “such other actions as the Administrator may determine”). These are amendments to existing regulations and affect certain owners and operators of facilities that directly emit greenhouse gases (GHGs) as well as certain suppliers. Regulated categories and examples of affected entities include those listed in Table 1 of this preamble.

TABLE 1—EXAMPLES OF AFFECTED ENTITIES BY CATEGORY

Category	NAICS	Examples of affected facilities
General Stationary Fuel Combustion Sources	Facilities operating boilers, process heaters, incinerators, turbines, and internal combustion engines.
	211	Extractors of crude petroleum and natural gas.
	321	Manufacturers of lumber and wood products.
	322	Pulp and paper mills.
	325	Chemical manufacturers.
	324	Petroleum refineries, and manufacturers of coal products.
	316, 326, 339	Manufacturers of rubber and miscellaneous plastic products.
	331	Steel works, blast furnaces.
	332	Electroplating, plating, polishing, anodizing, and coloring.
	336	Manufacturers of motor vehicle parts and accessories.
	221	Electric, gas, and sanitary services.
	622	Health services.
	611	Educational services.
Electricity Generation	221112	Fossil-fuel fired electric generating units, including units owned by federal and municipal governments and units located in Indian Country.
Acid Gas Injection Projects	211111 or 211112	Projects that inject natural gas containing CO ₂ underground.
Adipic Acid Production	325199	Adipic acid manufacturing facilities.
Aluminum Production	331312	Primary Aluminum production facilities.
Ammonia Manufacturing	325311	Anhydrous and aqueous ammonia manufacturing facilities.
Cement Production	327310	Portland cement manufacturing plants.
CO ₂ Enhanced Oil and Gas Recovery Projects	211	Oil and gas extraction projects using CO ₂ enhanced oil and gas recovery.
Electrical Equipment Use	221121	Electric bulk power transmission and control facilities.
Electrical Equipment Manufacture or Refurbishment.	33531	Power transmission and distribution switchgear and specialty transformers manufacturing facilities.
Electronics Manufacturing	334111	Microcomputers manufacturing facilities.
	334413	Semiconductor, photovoltaic (solid-state) device manufacturing facilities.
	334419	LCD unit screens manufacturing facilities. MEMS manufacturing facilities.
Ethanol Production	325193	Ethyl alcohol manufacturing facilities.
Ferroalloy Production	331112	Ferroalloys manufacturing facilities.
Fluorinated GHG Production	325120	Industrial gases manufacturing facilities.
Food Processing	311611	Meat processing facilities.

TABLE 1—EXAMPLES OF AFFECTED ENTITIES BY CATEGORY—Continued

Category	NAICS	Examples of affected facilities		
Glass Production	311411	Frozen fruit, juice, and vegetable manufacturing facilities.		
	311421	Fruit and vegetable canning facilities.		
	327211	Flat glass manufacturing facilities.		
	327213	Glass container manufacturing facilities.		
	327212	Other pressed and blown glass and glassware manufacturing facilities.		
	NA	CO ₂ geologic sequestration projects.		
	325120	Chlorodifluoromethane manufacturing facilities.		
	325120	Hydrogen manufacturing facilities.		
	423730	Air-conditioning equipment (except room units) merchant wholesalers.		
	333415	Air-conditioning equipment (except motor vehicle) manufacturing.		
Industrial Waste Landfills	423620	Air-conditioners, room, merchant wholesalers.		
	443111	Household Appliance Stores.		
	326150	Polyurethane foam products manufacturing.		
	335313	Circuit breakers, power, manufacturing.		
	423610	Circuit breakers merchant wholesalers.		
	562212	Solid waste landfills.		
	221320	Sewage treatment facilities.		
	322110	Pulp mills.		
	322121	Paper mills.		
	322122	Newsprint mills.		
Industrial Wastewater Treatment	322130	Paperboard mills.		
	311611	Meat processing facilities.		
	311411	Frozen fruit, juice and vegetable manufacturing facilities.		
	311421	Fruit and vegetable canning facilities.		
	322110	Pulp mills.		
	322121	Paper mills.		
	322122	Newsprint mills.		
	322130	Paperboard mills.		
	311611	Meat processing facilities.		
	311411	Frozen fruit, juice, and vegetable manufacturing facilities.		
Iron and Steel Production	311421	Fruit and vegetable canning facilities.		
	325193	Ethanol manufacturing facilities.		
	324110	Petroleum refineries.		
	331111	Integrated iron and steel mills, steel companies, sinter plants, blast furnaces, basic oxygen process furnace shops.		
	331419	Primary lead smelting and refining facilities.		
	331492	Secondary lead smelting and refining facilities.		
	327410	Calcium oxide, calcium hydroxide, dolomitic hydrates manufacturing facilities.		
	331419	Primary refiners of nonferrous metals by electrolytic methods.		
	562212	Solid waste landfills.		
	221320	Sewage treatment facilities.		
Nitric Acid Production	325311	Nitric acid manufacturing facilities.		
	32511	Ethylene dichloride manufacturing facilities.		
	325199	Acrylonitrile, ethylene oxide, methanol manufacturing facilities.		
	325110	Ethylene manufacturing facilities.		
	325182	Carbon black manufacturing facilities.		
	324110	Petroleum refineries.		
	Petroleum Refineries	486210	Pipeline transportation of natural gas.	
		Petroleum and Natural Gas Systems	221210	Natural gas distribution facilities.
			211	Extractors of crude petroleum and natural gas.
	Phosphoric Acid Production	211112	Natural gas liquid extraction facilities.	
325312		Phosphoric acid manufacturing facilities.		
Pulp and Paper Manufacturing		322110	Pulp mills.	
	322121	Paper mills.		
	322130	Paperboard mills.		
	325181	Alkalies and chlorine manufacturing facilities.		
Soda Ash Manufacturing	327910	Silicon carbide abrasives manufacturing facilities.		
Silicon Carbide Production	221121	Electric bulk power transmission and control facilities.		
Sulfur Hexafluoride (SF ₆) from Electrical Equipment.				
Titanium Dioxide Production	325188	Titanium dioxide manufacturing facilities.		
Underground Coal Mines	212113	Underground anthracite coal mining operations.		
	212112	Underground bituminous coal mining operations.		
	Zinc Production	331419	Primary zinc refining facilities.	
331492		Zinc dust reclaiming facilities, recovering from scrap and/or alloying purchased metals.		
Suppliers of Industrial Greenhouse Gases	325120	Industrial gas manufacturing facilities.		
Suppliers of Petroleum Products	324110	Petroleum refineries.		
Suppliers of Natural Gas and Natural Gas Liquids.	221210	Natural gas distribution facilities.		
Suppliers of Carbon Dioxide (CO ₂)	211112	Natural gas liquid extraction facilities.		
	325120	Industrial gas manufacturing facilities.		

Table 1 of this preamble is not intended to be exhaustive, but rather provides a guide for readers regarding facilities likely to be affected by this action. Types of facilities different from those listed in the table could also be subject to reporting requirements. To determine whether you are affected by this action, you should carefully examine the applicability criteria found in 40 CFR part 98, subpart A or the relevant criteria in the sections related to suppliers and direct emitters of GHGs. If you have questions regarding the applicability of this action to a particular facility, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** Section.

What is the effective date? The final rule is effective on January 1, 2014. Section 553(d) of the Administrative Procedure Act (APA), 5 U.S.C. Chapter 5, generally provides that rules may not take effect earlier than 30 days after they are published in the **Federal Register**. EPA is issuing this final rule under section 307(d)(1) of the Clean Air Act, which states: "The provisions of section 553 through 557 * * * of Title 5 shall not, except as expressly provided in this section, apply to actions to which this subsection applies." Thus, section 553(d) of the APA does not apply to this rule. EPA is nevertheless acting consistently with the purposes underlying APA section 553(d) in making this rule effective on January 1, 2014. Section 5 U.S.C. 553(d)(3) allows an effective date less than 30 days after publication "as otherwise provided by the agency for good cause found and published with the rule." As explained below, EPA finds that there is good cause for this rule to become effective on January 1, 2014, even though this may result in an effective date fewer than 30 days from date of publication in the **Federal Register**.

While this action is being signed prior to December 1, 2013, there is likely to be a significant delay in the publication of this rule as it contains complex equations and tables and is relatively long. As an example, then-Acting Administrator Bob Perciasepe signed the proposed 2013 Revisions Rule on March 8, 2013, but the proposed rule was not published in the **Federal Register** until April 2, 2013. Further, we anticipate that the partial federal government shutdown from October 1 to October 16, 2013, may have caused a backlog in the **Federal Register** publication process that may cause additional delays. The purpose of the 30-day waiting period prescribed in 5 U.S.C. 553(d) is to give affected parties a reasonable time to adjust their

behavior and prepare before the final rule takes effect.

To employ the 5 U.S.C. 553(d)(3) "good cause" exemption, an agency must "balance the necessity for immediate implementation against principles of fundamental fairness which require that all affected persons be afforded a reasonable amount of time to prepare for the effective date of its ruling."¹ Where, as here, the final rule will be signed and made available on the EPA Web site more than 30 days before the effective date, but where the publication is likely to be delayed due to the complexity and length of the rule, the regulated entities are afforded this reasonable amount of time. This is particularly true given that most of the revisions being made in this package provide flexibilities to sources covered by the reporting rule or require no additional action by affected sources. Those amendments that increase burden affect a very small number of new facilities and include flexibility provisions such as Best Available Monitoring Methods. We balance these circumstances with the need for the amendments to be effective by January 1, 2014; a delayed effective day would result in regulatory uncertainty, program disruption, and an inability to have the amendments (many of which clarify requirements, relieve burden, and/or are made at the request of the regulated facilities) effective for the 2014 reporting year. Accordingly, we find good cause exists to make this rule effective on January 1, 2014, consistent with the purposes of 5 U.S.C. 553(d)(3).

Judicial Review. Under CAA section 307(b)(1), judicial review of this final rule is available only by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit (the Court) by January 28, 2014. Under CAA section 307(d)(7)(B), only an objection to this final rule that was raised with reasonable specificity during the period for public comment can be raised during judicial review. Section 307(d)(7)(B) of the CAA also provides a mechanism for the EPA to convene a proceeding for reconsideration, "[i]f the person raising an objection can demonstrate to EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule." Any person seeking to make such a demonstration to

us should submit a Petition for Reconsideration to the Office of the Administrator, Environmental Protection Agency, Room 3000, William Jefferson Clinton Building, 1200 Pennsylvania Ave. NW., Washington, DC 20460, with a copy to the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20004. Note that under CAA section 307(b)(2), the requirements established by this final rule may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce these requirements.

Acronyms and Abbreviations. The following acronyms and abbreviations are used in this document.

APA Administrative Procedure Act
 AR4 Fourth Assessment Report
 ASTM American Society for Testing and Materials
 BACT Best available control technology
 BMM best available monitoring methods
 CAA Clean Air Act
 CAMD Clean Air Markets Division
 CBI confidential business information
 CEMS continuous emissions monitoring system
 CFR Code of Federal Regulations
 CH₄ methane
 CO₂ carbon dioxide
 CO_{2e} carbon dioxide equivalent
 DOC degradable organic carbon
 DOE Department of Energy
 EAF electric arc furnace
 e-GGRT Electronic Greenhouse Gas Reporting Tool
 EIA Energy Information Administration
 EPA U.S. Environmental Protection Agency
 FBC fluidized bed combustor
 FLIGHT Facility Level Information on Green House Gases Tool
 FR Federal Register
 F-GHG fluorinated greenhouse gas
 F-HTF fluorinated heat transfer fluid
 GHG greenhouse gas
 GHGRP Greenhouse Gas Reporting Program
 GWP global warming potential
 HFC hydrofluorocarbon
 Hg mercury
 HHV high heat value
 HQ Headquarters
 ICR Information Collection Request
 IPCC Intergovernmental Panel on Climate Change
 ISBN International Standard Book Number
 LDC Local Distribution Company
 LPG liquid petroleum gases
 Mscf thousand standard cubic feet
 MSHA Mine Safety and Health Administration
 MSW municipal solid waste
 N₂O nitrous oxide
 NAICS North American Industry Classification System
 NASA National Aeronautics and Space Administration

¹ *Omnipoint Corp. v. FCC*, 78 F.3d 620, 630 (D.C. Cir. 1996), quoting *U.S. v. Gavrilovic*, 551 F.2d 1099, 1105 (8th Cir. 1977).

NGL natural gas liquid
 NSPS New Source Review Performance Standards
 NTTAA National Technology Transfer and Advancement Act of 1995
 OAQPS Office of Air Quality Planning and Standards
 OMB Office of Management and Budget
 ORIS Office of the Regulatory Information System
 PAL plant-wide applicability limits
 PFC perfluorocarbon
 PSD prevention of significant deterioration
 PTE potential to emit
 QA/QC quality assurance/quality control
 R&D Research and Development
 RFA Regulatory Flexibility Act
 SAR Second Assessment Report
 SF₆ sulfur hexafluoride
 SIP State implementation plan
 TAR Third Assessment Report
 TPY tons per year
 UNFCCC United Nations Framework Convention on Climate Change
 U.S. United States
 UMRA Unfunded Mandates Reform Act of 1995
 XML extensible markup language

Organization of This Document. The following outline is provided to aid in locating information in this preamble.

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 - H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use
 - I. National Technology Transfer and Advancement Act
 - J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations
 - K. Congressional Review Act

I. Background

A. How is this preamble organized?

The first section of this preamble provides background information regarding the origin of the final amendments. This section also discusses the EPA's legal authority under the Clean Air Act to promulgate and amend the Greenhouse Gas Reporting Rule (40 CFR part 98, hereinafter referred to as "Part 98").

Section II of this preamble contains information on the final revisions to Part 98 and is organized by Part 98 subpart. It also describes the major changes made to each source category since proposal and provides a brief summary of significant public comments and the EPA's responses on issues specific to each source category. Section III of this preamble discusses the effective date of the revisions for new and existing reporters and the EPA's intent to publish a version of the Greenhouse Gas Reporting Program (GHGRP) data for the reporting years 2010, 2011, and 2012 to reflect a consistent time-series. Section IV of this preamble discusses the confidentiality determinations for new or substantially revised (i.e., requiring additional or different data to be reported) data reporting elements. Section V of this preamble discusses the impacts of the final amendments, including the impact of revised global warming potentials (GWPs) on new and existing reporters. Finally, Section VI of this preamble describes the statutory and executive order requirements applicable to this action.

B. Background on the Action

Part 98 was initially published in the **Federal Register** on October 30, 2009 (74 FR 56260). Part 98 became effective on December 29, 2009, and requires reporting of GHGs from certain facilities and suppliers. Subsequent notices were published in 2010 promulgating the requirements for subparts T, FF, II, and TT (75 FR 39736, July 12, 2010); subparts I, L, DD, QQ, and SS (75 FR 74774, December 1, 2010); and subparts RR and UU (75 FR 75060, December 1, 2010). A number of subparts have been revised since promulgation (75 FR 79092, December 17, 2010; 76 FR 73866, November 29, 2011; 77 FR 10373, February 22, 2012; 77 FR 51477, August 24, 2012; and subpart I, signed by the Administrator on August 16, 2013).

On April 2, 2013, the EPA proposed amendments to provisions in Part 98 in the "2013 Revisions to the Greenhouse Gas Reporting Rule and Proposed Confidentiality Determinations for New or Substantially Revised Data Elements" (hereinafter "2013 Revisions proposal") (77 FR 19802). The EPA is finalizing those amendments in this action, with certain changes following consideration of comments submitted. Responses to significant comments submitted on the proposed amendments can be found in Section II of this preamble.

C. Legal Authority

The EPA is finalizing these rule amendments under its existing CAA

authority provided in CAA section 114. As stated in the preamble to the 2009 final GHG reporting rule (74 FR 56260, October 30, 2009), CAA section 114(a)(1) provides the EPA broad authority to require the information required to be gathered by this rule because such data inform and are relevant to the EPA's carrying out a wide variety of CAA provisions. See the preambles to the proposed (74 FR 16448, April 10, 2009) and final Part 98 (74 FR 56260) for further information.

In addition, the EPA is finalizing confidentiality determinations for certain new or substantially revised data elements required under the proposed GHG Reporting Rule under its authorities provided in sections 114, 301 and 307 of the CAA. As mentioned above, CAA section 114 provides the EPA authority to collect the information in Part 98. Section 114(c) requires that EPA make publicly available information obtained under section 114 except for information (excluding emission data) that qualifies for confidential treatment. The Administrator has determined that this final rule is subject to the provisions of section 307(d) of the CAA.

D. What GWP values are addressed in this notice?

In the 2013 Revisions proposal, the EPA proposed to amend Table A–1 to Subpart A, General Provisions, Part 98 (hereinafter referred to as “Table A–1”) to revise the GWP values for certain GHGs that have been included in the Intergovernmental Panel for Climate Change (IPCC) Fourth Assessment Report (hereinafter referred to as “IPCC AR4” or “AR4”)² and to add GWPs for 26 additional fluorinated GHGs that are not currently included in the table. The GWPs in Table A–1 are used to convert the emissions and supply data for each greenhouse gas into carbon dioxide equivalents (CO₂e).

As part of this action, the EPA is finalizing amendments to Table A–1 to revise the GWPs of certain GHGs that are already listed in the table to incorporate GWPs from the IPCC AR4. The EPA is finalizing these changes for two reasons. First, the revisions improve the quality of reported emissions and supply by reflecting improved scientific understanding of direct and indirect radiative forcing and atmospheric lifetimes of certain GHGs. Second, for

these GHGs, the revisions ensure comparability of data collected in the GHGRP to the Inventory of U.S. Greenhouse Gas Emissions and Sinks (hereinafter referred to as “Inventory”) that the EPA compiles annually to meet international commitments and to GHG inventories prepared by other countries.

After carefully considering comments received, the EPA is not finalizing in this rulemaking the GWPs for the 26 additional fluorinated GHGs not included in the IPCC AR4 that we proposed in the 2013 Revisions proposal. Based on comments that EPA should not include compounds that are not included in an IPCC study or peer-reviewed, as well as comments on permitting applicability, the EPA is reevaluating its approach to assigning GWPs for compounds not included in the IPCC AR4 and may address these compounds in a separate future action.

II. Overview of Final Corrections and Other Amendments and Responses to Public Comment

The EPA is finalizing technical corrections, clarifying revisions, and other amendments to Part 98 to improve the quality and consistency of the data collected by the EPA. Many of the changes proposed were in response to feedback received from stakeholders during program implementation. Sections II.A through II.AA of this preamble describe the more substantive corrections, clarifying, and other amendments that we are finalizing for each subpart, including changes that affect the applicability of a subpart, changes that affect the applicability of a calculation method to a specific source at a facility, changes or corrections to calculation methods that substantially revise the calculation method or output of the equation, revisions to data reporting requirements that substantively clarify the reported data element or introduce a new data element, clarifications of general monitoring and quality assurance requirements, and changes to add new definitions. We have summarized the amendments to each subpart in the memorandum, “Final Table of 2013 Revisions to the Greenhouse Gas Reporting Rule” (hereinafter referred to as the “Table of 2013 Revisions”) available in the docket for this rulemaking (EPA–HQ–OAR–2012–0934). The Table of 2013 Revisions describes each final change within a subpart and includes many minor revisions that were proposed but are not discussed in detail in this preamble (e.g., straightforward clarifications of requirements to better reflect the EPA's intent, simple corrections to calculation

terms or cross-references that do not affect the output of calculations, harmonizing changes within a subpart (such as changes to terminology), simple editorial and minor error corrections, or removal of redundant text). These minor revisions are not discussed in this preamble because they do not substantially change the applicability, calculation, monitoring, recordkeeping, or reporting requirements of Part 98. The Table of 2013 Revisions also provides the existing rule text, the finalized changes, and indications of which amendments are being finalized as proposed and which amendments differ from the changes proposed in the 2013 Revisions proposal.

The amendments described in this preamble are listed in this section by subpart. The amendments to each subpart are followed by a summary of the major comments on those amendments and the EPA's responses. Minor comments received on the proposed amendments and the EPA's responses are available in the docket to this rulemaking (EPA–HQ–OAR–2011–0934). Some of the comments received on the proposed amendments included commenter suggestions of additional revisions to Part 98 that were beyond the scope of the proposed rulemaking. These additional revisions are identified in Sections II.K, II.N, II.R, and II.BB of this preamble. Although we are not including the suggested revisions in this final rule, the EPA reserves its discretion to consider these comments in any future rulemaking.

A complete listing of all comments and the EPA's responses is located in the comment response document in Docket Id. No. EPA–HQ–OAR–2012–0934.

Additional rationale for these amendments is available in the preamble to the proposed rule (78 FR 19802).

A. Subpart A—General Provisions

1. Summary of Final Amendments to Subpart A—Global Warming Potentials

In this action, we are revising Table A–1 to subpart A of Part 98 by updating the GWP values of certain compounds. These changes affect facilities and suppliers under Part 98 reporting the following greenhouse gases: Methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), certain hydrofluorocarbons (HFCs), certain perfluorocarbons (PFCs), and certain other fluorinated greenhouse gases (F–GHGs).³

³ Fluorinated greenhouse gases, as defined in 40 CFR 98.6, include sulfur hexafluoride, nitrogen trifluoride, and any fluorocarbon except for

² IPCC Fourth Assessment Report (AR4), 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, Pachauri, R.K. and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

As proposed, we are revising GWPs for GHGs already in Table A-1 to reflect more accurate GWPs from the IPCC AR4 to better characterize the climate impacts of individual GHGs and to ensure continued consistency with other U.S. climate programs, including the Inventory. The amendments to the GWPs in Table A-1 that we are finalizing in this notice are discussed in Section II.A.1 of this preamble. The EPA's response to comments received on the proposed revisions to Table A-1 are in Section II.A.2 of this preamble. The schedule for implementing these amendments is discussed in Section III.A of this preamble. Section III.B of this preamble clarifies that the EPA is not requiring the revision of reports previously submitted to reflect the revised GWPs in Table A-1 or other amendments in this final rulemaking. Prior year reports, using original GWPs, will remain publicly available. However, the EPA will also publish a version of the CO₂e emissions and supply estimates for the reporting years 2010, 2011, and 2012 using the revised GWPs in Table A-1. This will allow the

Agency and public to view and compare trends in GHG data, beginning with the first year of GHGRP reporting, using consistent GWPs and without placing any additional burden on reporters.

As discussed in the preamble to the 2013 Revisions proposal, the revisions to the GWPs in Table A-1 will change not only the amount of CO₂e reported by existing reporters but also change the number of reporters subject to Part 98. Some facilities to which the rule did not previously apply will now meet the thresholds for reporting based on increases in calculated CO₂e. The EPA received specific comments regarding the expansion of applicability that could occur in certain sectors due to the revision of the GWP for methane and due to certain sector-specific applicability and reporting characteristics. For Municipal Solid Waste (MSW) Landfills, commenters raised a specific concern related to the applicability for certain closed landfills that would become subject to Part 98 due to the revised GWP for methane. To address this concern, the EPA is amending subpart HH, which covers

MSW Landfills, as discussed in Section II.R of this preamble.

The EPA has also updated the impacts analysis to address comments received on the proposed rule regarding compliance costs and to incorporate data from the 2011 reporting year that became available following the publication of the proposed rule. The impacts of the final amendments for affected subparts, including the number of new reporters for each subpart, are discussed in Section V of this preamble.

Summary of Final Amendments to Global Warming Potentials. For compounds that are included in the IPCC AR4, the EPA is adopting the AR4 GWPs as proposed. This approach will increase the accuracy of the CO₂e estimates reported and is in keeping with the Agency's intent to have the GHGRP complement data compiled for the annual Inventory and other EPA programs. Table 2 of this preamble lists the final GWP values for each GHG. As discussed in Section I.D of this preamble, the EPA may address compounds that are not included in AR4 in a separate action.

TABLE 2—GHGS WITH REVISED GWPs FOR TABLE A-1

Name	CAS No. ⁴	Global warming potential
Methane	74-82-8	25
Nitrous oxide	10024-97-2	298
HFC-23	75-46-7	14,800
HFC-32	75-10-5	675
HFC-41	593-53-3	92
HFC-125	354-33-6	3,500
HFC-134	359-35-3	1,100
HFC-134a	811-97-2	1,430
HFC-143	430-66-0	353
HFC-143a	420-46-2	4,470
HFC-152a	75-37-6	124
HFC-227ea	431-89-0	3,220
HFC-236fa	690-39-1	9,810
HFC-245ca	679-86-7	693
HFC-43-10mee	138495-42-8	1,640
Sulfur hexafluoride	2551-62-4	22,800
PFC-14 (Perfluoromethane)	75-73-0	7,390
PFC-116 (Perfluoroethane)	76-16-4	12,200
PFC-218 (Perfluoropropane)	76-19-7	8,830
PFC-3-1-10 (Perfluorobutane)	355-25-9	8,860
Perfluorocyclobutane	115-25-3	10,300
PFC-4-1-12 (Perfluoropentane)	678-26-2	9,160
PFC-5-1-14 (Perfluorohexane)	355-42-0	9,300

We are not revising GWPs for the remaining compounds in Table A-1, which were promulgated in the original final Part 98 rulemaking. Because the remaining F-GHGs in Table A-1 were not addressed by the IPCC's Second

Assessment Report (SAR) at the time that the original Part 98 was finalized, the EPA promulgated GWPs for these compounds from the IPCC AR4 in the October 30, 2009 final Part 98. The only exception was the GWP for sevoflurane,

which was not available in the SAR or AR4; the EPA promulgated the GWP for sevoflurane based on a peer-reviewed study.

The EPA received multiple comments on the proposed revisions of the GWPs

controlled substances as defined at 40 CFR part 82, subpart A and substances with vapor pressures of less than 1 mm of Hg absolute at 25 degrees C.

⁴ Each chemical substance has a universal, unique identifier maintained in the Chemical Abstracts Service (CAS) Registry and known as the

substance's CAS Number. See <http://www.cas.org/content/chemical-substances>.

in Table A–1. In some cases, commenters disagreed with the need to update the GHGRP to match the values used in the Inventory or disagreed with the use of AR4 values. For example, we received multiple comments requesting that the EPA consider more recently published values, or wait until the publication of the IPCC Fifth Assessment Report (hereinafter referred to as “AR5”) to amend the GWPs in Table A–1. As discussed in the preamble to the proposed rule, the EPA is adopting AR4 values for certain compounds currently in Table A–1 to increase the accuracy of the CO₂e estimates collected under the GHGRP to better inform EPA policies. The AR4 GWPs will complement the reporting metrics used in other U.S. climate programs, including the Inventory that is submitted to the United Nations Framework Convention on Climate Change (UNFCCC).⁵ The AR4 GWPs will also ensure the compatibility of Part 98 with the President’s Climate Action Plan and the U.S. commitment to GHG emission reductions to the United Nations, both of which reiterate President Obama’s 2009 pledge that the U.S. would reduce its GHG emissions by 17 percent below 2005 levels by 2020, which both the U.S. and United Nations will assess using AR4 GWPs.⁶ We view AR5 values as unlikely to come into use by the UNFCCC or other widespread use for several years. For example, the IPCC finalized AR4 in 2007 but the UNFCCC has adopted these values for parties’ Inventory submissions just starting in 2015. Therefore, for those compounds in Table A–1 for which a GWP is available in the AR4, we are adopting the AR4 values as proposed and are not adopting GWPs from AR5. See Section II.A.2.a of this preamble for the EPA’s response to comments related to the adoption of AR4 GWPs.

We are not including GWPs from the World Meteorological Organization (WMO) *Scientific Assessment of Ozone Depletion: 2010* (Global Ozone Research and Monitoring Project-Report No. 52, 516 pp., Geneva, Switzerland, 2011) in

⁵ Parties to the UNFCCC, including the U.S., have agreed to submit annual reports in 2015 and future years using GWP values from the IPCC AR4.

⁶ The President’s Climate Action Plan, Executive Office of the President, June 2013, p. 4, <http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf>; Jonathan Pershing, Clarification of the U.S. Economy-Wide Target, http://unfccc.int/files/bodies/awg-ica/application/pdf/20120517_usa_0940.pdf; and UNFCCC GE.11–70204, Subsidiary Body for Scientific and Technological Advice 34th Session, 6–16 June 2011, Compilation of economy-wide emission reduction targets to be implemented by Parties included in Annex I to the Convention, FCCC/SB/2011/INF.1/Rev.1, pp. 7–8, <http://unfccc.int/resource/docs/2011/sb/eng/inf01r01.pdf>.

this final rule. In the proposed rule, the EPA sought comment on whether GWPs for fluorinated ethers and alcohols from the WMO Scientific Assessment should be adopted in Table A–1. We did not receive any comments related to the WMO on this rulemaking; without any commenter support, we have decided not to adopt GWPs from that assessment at this time.

The subpart W calculations for annual mass of GHG emissions for gas pneumatic device venting and natural gas driven pneumatic pump venting in CO₂e are calculated using a conversion factor that was developed using the methane GWP from Table A–1. In addition, subpart W total GHG emissions are calculated using an equation that references numeric GWPs, instead of directly referencing Table A–1. Because the GWP values that inform the methane calculations in these three equations reference the previous GWP value, each equation needs to be amended separately to account for the change in the numeric GWP value for methane in Table A–1. While the EPA proposed that the new GWP apply throughout all of Part 98, the EPA did not specifically propose amendments to the regulatory text referencing the numeric GWP in these three discrete equations. In addition to finalizing the GWP value for methane in Table A–1, we are also amending the methane conversion factor and methane GWP used in three subpart W equations to ensure the correct GWP value for methane in Table A–1 is used in these calculations. See Section II.J of this preamble for more information.

2. Summary of Comments and Responses—Global Warming Potentials

a. Summary of Comments and Responses on the Revision of the GHGRP To Complement the Inventory and the Use of IPCC AR4 GWPs

This section summarizes the significant comments and responses related to the revision of the GHGRP to incorporate AR4 GWP values in Table A–1 to complement the Inventory. See the comment response document in Docket Id. No. EPA–HQ–OAR–2012–0934 for a complete listing of all comments and responses.

Comment: Four commenters expressed support for the EPA’s proposal to revise the GHGRP to complement the Inventory. One commenter stated that the revision to the GWP of methane will enable the EPA to use the subpart W reported data to update the annual Inventory. They noted that the subpart W data will improve the accuracy of the Inventory’s

estimated methane emissions for the natural gas sector. Several commenters supported adoption of AR4 GWP values, because the IPCC is the international leader in assessing climate change and determining a scientifically based and standardized list of GHGs and associated GWPs. These commenters reiterated that the EPA’s commitment to report emissions using IPCC methods is well articulated in the preamble to the proposed rule, which states that the EPA is proposing revisions to Table A–1 “to ensure continued consistency with the Inventory as the Inventory begins to use GWPs from the IPCC Fourth Assessment Report” (77 FR 19807).

Three commenters disagreed with EPA’s proposal to incorporate AR4 GWP values. These commenters asserted that there is not a strong scientific basis for updating the GWPs in Table A–1 to subpart A of Part 98 to reflect the values adopted in the AR4. The commenters contended that the proposed GWPs are not necessarily improved or more technically precise than the values EPA has already adopted. The commenters noted that the IPCC AR4 discussed some of the uncertainties associated with the AR4 GWPs. They stated that the GWPs adopted by the IPCC are derived using certain simplifications that have been the subject of criticism and that shortcomings in scientific knowledge make objective assessment of GHG impacts difficult.

Some commenters suggested that the EPA wait to revise Table A–1 until after IPCC AR5 is released. These commenters contended that international reporting data are outdated (for instance, they stated that GWPs from the IPCC Second Assessment Report, which was finalized in 1995, are required to be used for inventory reporting until 2015, when values from AR4, which was finalized in 2007, will be substituted), and are concerned that AR5 would not be incorporated into inventory reporting until 2020 or later. They asserted that the EPA’s logic in proposing to replace the GWP values in the SAR with those in the AR4 should apply equally to replacing the GWP values from the AR4 with those in the AR5 when they become available. They stated that U.S. national and state regulation must be based on the latest and most robust scientific consensus of climate science, including appropriate GWPs, and that the advance of U.S. science and regulatory policy should not be slowed by a non-identical international emission reporting process designed for other purposes.

Commenters also disputed the EPA’s rationale of being bound by UNFCCC reporting guidelines to use AR4 GWPs

starting in 2015 for purposes of annual reports of national GHG inventories to the UNFCCC. One commenter stated that not incorporating AR5 GWPs is unreasonable and will potentially compromise the integrity of the GHGRP and future regulatory efforts based thereon. While the commenter acknowledged the benefit in reporting national inventories from around the world on a consistent basis, they maintained that the published GHGRP data and the national GHG inventory are produced for different purposes and need not use the same GWP values. The commenter stated that the programs do not cover the same emissions or emission sources, noting, for example, that the GHGRP requires reporting of a wide variety of pollutants that are not required to be included in the national inventories reported to UNFCCC.

Response: As described in the preamble of the proposed GHG Reporting Rule (74 FR 16448, April 10, 2009), the GHGRP is intended to provide data to support EPA climate policy and to supplement and complement existing U.S. government programs related to climate policy and research, including the Inventory submitted to the UNFCCC. The GHGRP provides data to develop and inform the Inventory and other U.S. federal and state climate programs by advancing the understanding of emission processes and monitoring methodologies for particular source categories or sectors. For example, GHGRP data published through the EPA's Facility Level Information on Green House gases Tool (FLIGHT) may be used by state and local entities to better understand the contribution of emissions from specific regional industries, or by EPA regulatory programs to review emissions from certain facilities within an industry to inform policy decisions. The GHGRP also complements the Inventory and other U.S. programs by providing data from individual facilities and suppliers above certain thresholds. Collected facility, unit, and process-level GHG data from the GHGRP supplements national statistics and improves the emission estimates presented in the Inventory. During the development of Part 98, the EPA generally proposed and finalized estimation methodologies and reporting metrics that were based on recent scientific data and that were consistent with the international reporting standards under the UNFCCC and the Inventory.

The goal of Part 98 is to collect data of sufficient accuracy and quality to inform future climate policy development. In this final rule, the EPA

is adopting the proposed AR4 values in Table A-1 to ensure more accurate CO₂ emission and supply estimates are collected for the GHGRP. As noted in the preamble to the proposed amendments (78 FR 19808), the IPCC AR4 GWPs reflect advances in scientific knowledge on the radiative efficiencies and atmospheric lifetimes of carbon dioxide and certain greenhouse gases, taking into account the increase in modeled atmospheric CO₂ concentrations since the SAR was published. The GWP of a given gas is dependent on the radiative efficiency of that gas, the lifetime of that gas, and any indirect forcing effects of that gas, all relative to the same values for carbon dioxide. The IPCC Third Assessment Report (TAR) used updated values of these factors to provide more accurate GWPs than did the IPCC SAR, and similarly the IPCC Fourth Assessment Report (AR4) was an improvement over the TAR. The TAR stated that GWP updates were made for those chemicals "where significantly different new laboratory or radiative transfer results have been published."⁷ In addition, the TAR notes that the radiative efficiency of several gases, including CO₂, depend on the background concentration. As the background concentration rises, the radiative efficiency of an additional increment of that gas decreases. Due to updated background concentrations and other updates, the TAR calculated a value for the reference CO₂ gas that was 13 percent smaller than the similar calculation for the SAR; because all GWPs are calculated with reference to CO₂, this increases other GWPs proportionally.⁸ The AR4 calculation for the reference CO₂ gas, taking into account the continued increase in background concentration, was 8.7 percent lower than the TAR value.⁹ The AR4 also relied on a number of publications that used experiments to improve the estimates of the radiative efficiencies of a number of the fluorinated compounds, with changes of up to 40 percent in those values for some compounds.¹⁰ In addition,

⁷ IPCC TAR WG1 (2001), Houghton, J.T.; Ding, Y.; Griggs, D.J.; Noguer, M.; van der Linden, P.J.; Dai, X.; Maskell, K.; and Johnson, C.A., ed., *Climate Change 2001: The Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, ISBN0-521-80767-0 (pb: 0-521-01495-6), p. 385.

⁸ IPCC TAR WG1, p. 386.

⁹ IPCC Fourth Assessment Report (AR4), 2007. *Climate Change 2007: The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, p. 211.

¹⁰ AR4, p. 211.

improved estimates of the effects of methane on stratospheric water vapor, itself a greenhouse gas, led to an increase in the factor used to estimate the GWP of methane due to that effect of 15 percent rather than 5 percent as in the TAR and SAR.¹¹

As such, each successive assessment provides more accurate GWP estimates as experiments and improved computational methods lead to more accurate estimates of the radiative efficiencies, atmospheric lifetimes, and indirect effects of the various gases. Additionally, the more recent assessments reflect more up-to-date background concentrations, which are necessary for accurately calculating the radiative efficiency of the different gases. The AR4 GWPs for these F-GHGs are therefore more accurate for comparison of the climate impacts of individual GHGs than the values from the IPCC SAR that were originally adopted in Table A-1, and are more appropriate for supporting the overall goals of the GHGRP. For the reasons stated above, we disagree with the commenters that stated there is not a strong scientific basis for updating the GWPs in Table A-1 to reflect the values in the IPCC AR4.

In the development of the 2009 final reporting rule, the EPA responded to concerns regarding the use of the GWP metric and determined that GWP is the most prudent and appropriate approach for comparison of the climate impacts of individual greenhouse gases that have varying radiative efficiencies and atmospheric lifetimes (see Volume 2 of USEPA's Response to Public Comments on the Mandatory Greenhouse Gas Reporting Rule: Selection of Reporting Thresholds, Greenhouses Gases, and De Minimis Provisions, Docket Id. No. EPA-HQ-OAR-2008-0508-2259). The GWP metric inherently reflects the atmospheric life-span of GHGs and is an internationally accepted standard recognized and utilized by the IPCC, UNFCCC, and Kyoto Protocol.

As discussed in the preamble to the proposed amendments, one of the reasons we proposed AR4 GWPs for the chemicals currently in Table A-1 was to maintain consistency with the Inventory and similar U.S. domestic programs. This is consistent with our approach to date under the GHGRP; in the 2009 final reporting rule, the EPA specifically chose to use GWPs published in the IPCC Second Assessment Report for GHGs included in that report to allow comparisons between the Inventory, other U.S. climate programs, and the GHGRP. The EPA has received

¹¹ AR4, p. 214.

encouragement from stakeholders to continue to use GHG data from the GHGRP to complement and support development of the Inventory, such as for improvements to emissions estimates from the petroleum and natural gas production source categories. Using consistent GWPs allows for more efficient review of data collected through the GHGRP and other U.S. climate programs and reduces the potential errors that may arise when comparing multiple data sets or converting GHG emissions or supply based on separate GWPs. It also reduces the burden for reporters and agencies to keep track of separate GWPs when submitting information to these programs.

As discussed in the preamble to the proposed amendments, countries that submit inventories to the UNFCCC have decided to begin using GWP values from the IPCC AR4 for annual inventories submitted in 2015 and expected to continue to use the AR4 GWPs for several years thereafter. Accordingly, the United States has a policy commitment to begin using GWP values from the IPCC AR4 for annual inventories submitted in 2015 and beyond. Because one of the purposes of the GHGRP is to supplement the Inventory, the EPA determined that it is most appropriate to adopt the AR4 GWPs for the compounds currently in Table A-1 for the annual GHGRP reports submitted in 2014, in order to meet the needs of the Inventory timeframe. As noted in Section II.A.1 of this preamble, use of the AR4 GWPs will also ensure compatibility of the GHGRP with the President's Climate Action Plan and the U.S. commitment to GHG emission reductions to the United Nations.¹²

The EPA agrees with commenters that using the latest and most robust GWPs from the IPCC AR5 for the compounds currently in Table A-1, once AR5 is published, could lead to more accurate assessments of climate impacts in the future. We considered waiting until publication of AR5 values and adopting those values for Table A-1, as suggested by commenters. We balanced the

benefits of adopting more recent GWPs to better characterize national GHG emissions and inform EPA policies with the benefit of retaining consistency across national and international programs, particularly the Inventory, for compounds that are included in AR4, and we believe that a potential gain in accuracy does not justify the loss of consistency with UNFCCC reporting (and associated policy analysis) that would result.¹³ Specifically, we considered that even though we anticipate that the AR5 GWPs will be published in coming months, the AR5 assessment has not been yet adopted by the UNFCCC or other national or international programs and is not likely to be in the near future.¹⁴ Wholesale adoption of AR5 GWPs by the GHGRP while other EPA and international programs are using AR4 GWPs likely would cause stakeholder confusion, create an ongoing need to explain the distinction in GWPs in subsequent actions, and complicate decision-making.

The adoption of AR4 GWPs for those compounds currently in Table A-1 will improve the GHGRP, and by extension, EPA climate policies, by incorporating more scientifically accurate GWPs than the SAR values originally adopted in Table A-1. This approach also ensures that the GHGRP uses widely relied on, published, peer-reviewed GWP data. As discussed in the next comment and response, the EPA may consider adoption of AR5 GWPs or other GWP values for compounds currently listed in Table A-1 if these values are adopted by the UNFCCC and the global community.

Comment: Several commenters were concerned about the frequency with which the EPA intends to update Table A-1 in the future. One commenter contended that the EPA's proposed GWP revisions will not achieve consistency with the Inventory because

¹³ While the AR5 GWPs have not been publicly available during the development of this rule, the GWPs published in a recent article are likely to be the basis of updated GWPs in AR5. See Hodnebrog, Ø., M. Etminan, J. S. Fuglestvedt, G. Marston, G. Myhre, C. J. Nielsen, K. P. Shine, and T. J. Wallington, "Global Warming Potentials and Radiative Efficiencies of Halocarbons and Related Compounds: A Comprehensive Review," *Reviews of Geophysics*, Accepted manuscript online: 24 APR 2013.

¹⁴ AR4 was published in 2007 and is being adopted for Inventory reporting starting in 2015. "Revision of the UNFCCC reporting guidelines on annual inventories for Parties included in Annex I to the Convention," FCCC/CP/2011/9/Add.2, Decision 6/CP.17, 15 March 2012, available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a02.pdf#page=23>. AR5 is anticipated to be published in late 2013; adoption of AR5 for Inventory reporting is likely to be on a similar timeframe, if at all.

it would create confusion across reporting years. The commenter stated that industry should not have to adjust data collection and reporting protocols due to revised GWPs after only three years of reporting. Commenters were concerned that frequent future revisions to GWPs would place unnecessary burdens on reporters and would affect other regulatory programs that rely on the Part 98 GWPs, such as the title V and Prevention of Significant Deterioration (PSD) permitting programs under the EPA's Tailoring Rule (75 FR 31532, June 3, 2010). Two additional commenters expressed concern that future revisions to the GWP values by the IPCC would drive further rule revisions by the EPA. The commenters stated that if the EPA's desire is to ensure consistency between the Inventory and GHGRP, future changes to the GWP values seem inevitable. They stated that these changes, if adopted, may require sources to constantly change their data gathering and evaluation protocols for reporting and require sources to continually revise (or have the EPA revise) their prior year submissions.

Response: At the time that Part 98 was proposed, it was the EPA's intent to require reporting of emissions of individual gases as well as emissions in CO₂e. We explained that because GHGs have different heat trapping capacities, they are not directly comparable without translating them into common units (74 FR 16453, April 10, 2009). We intended at that time to allow for future updates of the GWPs in Table A-1 to reflect advances in the scientific research on the heat trapping capacities of individual gases. For example, in the proposed 2009 GHG Reporting Rule, the EPA explained the collection of individual gas emissions and conversion of emissions to CO₂e and noted that "reporting the quantity and type of gas emitted allows for future recalculation of CO₂e emissions in the event that GWP factors change" (74 FR 16448, April 10, 2009).

As discussed in this section of this preamble, we have determined that it is appropriate to update certain GWP values already in Table A-1 to the IPCC AR4 values, adopted by the UNFCCC for national inventory reporting beginning in 2015, at this time. However, as stated in the preamble to the 2013 Revisions proposal, the EPA does not intend to revise the GWPs in Table A-1 each time new data are published in the scientific literature. Instead, we intend to update GWPs periodically in the future as the UNFCCC reporting guidelines change (i.e., when the UNFCCC adopts values from a future IPCC assessment for

¹² The President's Climate Action Plan, Executive Office of the President, June 2013, p. 4, <http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf>; Jonathan Pershing, Clarification of the U.S. Economy-Wide Target, http://unfccc.int/files/bodies/awg-ica/application/pdf/20120517_usa_0940.pdf; and UNFCCC GE.11-70204, Subsidiary Body for Scientific and Technological Advice 34th Session, 6-16 June 2011, Compilation of economy-wide emission reduction targets to be implemented by Parties included in Annex I to the Convention, FCCC/SB/2011/INF.1/Rev.1, pp. 7-8, <http://unfccc.int/resource/docs/2011/sb/eng/inf01r01.pdf>.

compounds that are currently listed in AR4) and possibly as updated GWPs for new compounds are published in IPCC or WMO assessments or in other peer-reviewed literature. We note that there are generally significant lag times in adoption of new values by the UNFCCC. In the past, the parties to the UNFCCC have only infrequently updated the GWPs that countries use to report their GHG emissions (i.e., less than once every 10 years). Significant time may pass between publication of peer-reviewed GWPs, their adoption into IPCC scientific assessments of GWPs, and their subsequent adoption into the UNFCCC reporting guidelines. With these considerations, we will continue to weigh the benefits of updating the GHGRP GWPs to more current values against the benefits of maintaining the values used by the international reporting community and the values used in other U.S. climate programs, such as the joint EPA and National Highway Traffic Safety Administration (NHTSA) Light-Duty Vehicle GHG Emission Standards. The latter benefits include minimizing confusion and policy uncertainty. However, we consider periodic updates to Table A-1 to be necessary to ensure that the GHGRP incorporates scientific advances in climate science to best inform EPA policies and programs, such as regulatory options and voluntary reduction partnerships, and to provide accurate information to other stakeholders. We also acknowledge that although the GHGRP may collect and publish data using the AR4 GWPs or GWPs published in other peer-reviewed literature, the EPA and other policymakers may analyze the data collected using other GWPs as desired. For example, we received comments that the EPA should finalize the GWP values from IPCC AR5 when they are released (discussed above in this section of the preamble); while we are instead finalizing the GWP values from AR4, the GHGRP data is presented in a manner that stakeholders can calculate CO₂ other GWPs as desired.

The EPA recognizes that for some subparts, adoption of higher GWPs for certain compounds in Table A-1 (e.g., methane) could potentially place some facilities above the reporting threshold for Part 98 and increase the number of facilities that are affected by other EPA or state programs that have thresholds that rely on the GWPs in Table A-1 (e.g., EPA's Tailoring Rule) (see Section II.A.2.c and Section V of this preamble). We acknowledge that frequent adoption of new GWP values could also disrupt the continuity of data

across a time-series, making it more difficult for regulatory agencies and stakeholders to analyze and compare previously reported data. The EPA is addressing that concern for these final amendments by publishing a consistent time series with the revised GWPs while maintaining the certified emission reports; see Section III.B of this preamble for more information. With these considerations, the Agency intends to balance the need to update Table A-1 to incorporate scientific advancements with the impact on the number of reporters subject to Part 98, the accuracy of reported emissions, and the impacts to other regulatory programs.

b. Summary of Comments and Responses on the Use of 100-Year GWPs

Comment: One commenter agreed that the 100-year GWPs should be updated, but objected to the value the EPA proposed for methane, stating that the GWP of 25 (from the IPCC AR4) is out of date. The commenter stated that subsequent to the completion of AR4, the National Aeronautics and Space Administration (NASA) published an article in *Science* (Shindell, 2009)¹⁵ further updating the value for methane's 100-year GWP to incorporate net direct and indirect radiative forcing impacts from aerosols, which the prior AR4 estimates did not contemplate. This commenter contended that the EPA should adopt NASA's GWP of 33 for methane on a 100-year time horizon. Otherwise, the commenter maintained, known net impacts from aerosols will be ignored in the reported (calculated) emissions values, and decision-makers will not be informed of the correct impact of sources of methane emissions when developing climate action plans. The commenter stated that if the EPA does not use NASA's GWP value, then the agency should wait until the release of the IPCC AR5 and use that report's GWP for methane.

Several commenters requested that the EPA reconsider our prior decision to adopt only a 100-year GWP for methane. While many commenters supported the EPA's use of 100-year GWPs in the rule, we received a number of generalized messages requesting that we use 20-year GWP values in addition to the 100-year values. These commenters believe the use of the 20-year GWPs in the GHGRP would have important policy implications, because the exclusive use of a 100-year GWP implies that the only

period of concern for climate change is 100 years. The EPA received five unique comment letters recommending that facility and supplier CO₂e emissions data be calculated using both the 100-year GWP and 20-year GWP. One commenter added that facilities emitting 25,000 tons CO₂e per year (calculated using either a 100-year or 20-year GWP) should be required to report under Part 98. Another commenter requested that the EPA use only the 20-year values, instead of the 100-year values.

Several commenters referenced a variety of articles, studies, and conference proceedings supporting the idea that the reduction of methane is critical to slow down the rate of global warming and to reduce future peak temperatures. They believe the 100-year GWP the EPA uses de-emphasizes the importance and potential benefits of reducing the emissions of methane.

Two commenters disagreed with the EPA's rationale for requiring reporting based solely on 100-year GWP values, which is to maintain consistency with the UNFCCC's agreement to report national inventories for international purposes based on the 100-year GWP. Another commenter argued the GHGRP is intended to inform regulation of GHGs under the CAA. This commenter notes the IPCC has stated, "if the policy emphasis is to help guard against the possible occurrence of potentially abrupt, non-linear climate responses in the relatively near future, then a choice of a 20-year time horizon would yield an index that is relevant to making such decisions regarding appropriate greenhouse gas abatement strategies."¹⁶ Other commenters supported the EPA's adoption of the AR4 GWP for methane of 25, which is based on the 100-year time horizon.

Response: As noted in the "Response to Comments on Final Rule, Volume 3: General Monitoring Approach, the Need for Detailed Reporting, and Other General Rationale Comments" (see Docket Id. No EPA-HQ-OAR-2008-0508-2260), the EPA selected the 100-year GWPs because these values are the internationally accepted standard for reporting GHG emissions. For example, the parties to the UNFCCC agreed to use GWPs that are based on a 100-year time period for preparing national inventories, and the reports submitted by other signatories to the UNFCCC use GWPs based on a 100-year time period, including the GWP for methane and certain GHGs identified as short-lived

¹⁵ Shindell, D. T., Faluvegi, G., Koch, D. M., Schmidt, G. A., Unger, N., & Bauer, S. E. (2009). Improved attribution of climate forcing to emissions. *Science*, 326(5953), 716-718.

¹⁶ IPCC, *Climate Change 1994: Radiative Forcing of Climate Change and an Evaluation of the IPCC IS92 Emission Scenarios* 229. (John T. Houghton et al., ed., Cambridge University Press 1995).

climate pollutants. These values were subsequently adopted and used in multiple EPA climate initiatives, including the EPA's SNAP program and the Inventory, as well as EPA voluntary reduction partnerships (e.g., Natural Gas STAR). The EPA noted at the time that Part 98 was finalized that alternative metrics for comparing the potential climate impacts of different GHGs were being considered by the IPCC. However, the IPCC has not made a recommendation regarding adoption of the 20-year metric. Furthermore, although the UNFCCC has updated the international reporting guidelines to reference GWPs from AR4 for the year 2015 and beyond, the guidelines continue to specify GWPs with a 100-year time horizon. We have reviewed the NASA Science publication (Shindell et al., 2009)¹⁷ referenced by the commenter that provides a 100-year GWP for methane of 33. However, as discussed above, the EPA has decided to adopt AR4 values across the board because it is beneficial for both regulatory agencies and industry to use the same GWP values for these GHG compounds because it allows for more efficient review of data collected through the GHGRP and other U.S. climate programs, reduces potential errors that may arise when comparing multiple data sets or converting GHG emissions or supply based on separate GWPs, and reduces the burden for reporters and agencies to keep track of separate GWPs.

Regarding the use of 20-year GWPs, human-influenced climate change occurs on both short (decadal) and long (millennial) timescales. While there is no single best way to value both short and long-term impacts in a single metric, the 100-year GWP is a reasonable approach that has been widely accepted by the international community. If the EPA were to adopt a 20-year GWP solely for methane, or for certain other compounds, it would introduce a metric that is inconsistent with both the GWPs used for the remaining Table A-1 gases and with the reporting guidelines issued by the UNFCCC and used by the Inventory and other EPA programs. Additionally, the EPA and other federal agencies, calculating the impact of short-lived climate forcers using 100-year GWPs, are making reduction of short-lived climate forcers a priority.¹⁸ For the

reasons described above, the EPA is retaining a 100-year time horizon as the standard metric for defining GWPs in the GHGRP.

c. Summary of Comments and Responses on the Relationship of the Final Rule to Other EPA Programs (e.g., Tailoring Rule Programs) or State Programs

This section summarizes the significant comments and responses related to the relationship between the final rule and other EPA programs. See the comment response document in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to this topic.

Comment: Several commenters noted that changes to the GWPs in Table A-1 and any changes to the gases listed in Table A-1 create discontinuities in the assessment of emissions under permitting rules, which can create shifts in permitting requirements. In the case of title V permitting, commenters stated that facilities that become subject to title V as the result of revisions to Table A-1 should be allowed at least one year from the publication date of the revisions to assess the impact of the changes, submit a title V application, or apply for a synthetic minor limit to avoid title V. Commenters further stated that if a source has taken a synthetic minor limit on its CO₂e emissions to remain below the title V applicability threshold and is unable to meet the synthetic minor limit due to the revisions to the GWPs, then facilities should have a one year period to assess emissions, determine if the synthetic minor permit is no longer viable, and apply for the appropriate permit. Commenters stressed that there should be no penalty for non-compliance with the synthetic minor limit or title V permitting requirement. Commenters expressed similar concerns regarding new construction and modifications becoming subject to PSD requirements due to revisions to GWP values.

Some commenters argued revisions to the GWP values impact compliance with existing CO₂e permit limits for PSD avoidance, Best Available Control Technology (BACT), and plant-wide applicability limits (PAL). They also requested sources be allowed to continue using the old GWP values for a period of one year, so that affected facilities may seek revisions to their permits, redeterminations, or recalculation of these limits, as applicable. The commenters

recommended a provision designed to allow facilities time to incrementally adjust to changes in the current rules be made available if a change in the GWPs presents a problem for meeting a PAL that cannot be resolved.

One commenter asserted that while section 114 of the CAA, 42 U.S.C. 7414, is cited as the basis for the proposed rule, section 114 does not empower the EPA to change the thresholds for major source determinations under other programs, such as the Prevention of Significant Deterioration (PSD) and title V permitting programs. The commenter explained that section 114 governs recordkeeping and inspections, and that it allows the EPA to require sources to provide data about air emissions. The commenter stated that the amendments to the GWP values affect the major source and permitting thresholds and therefore, any changes to Table A-1 must be proposed and finalized under the EPA's authority to implement the relevant permitting program. Specifically, the commenter asserted that amendments to the PSD program must be made pursuant to CAA sections 160-169, the Indian Country minor source rule must be amended pursuant to CAA sections 171-179B, and the title V program must be amended pursuant to CAA sections 501-507. The commenter stated that revisions to Table A-1 should be evaluated and processed by EPA's Office of Air Quality Planning and Standards (OAQPS) because OAQPS published the Tailoring Rule and traditionally handles substantive permitting regulations. Several commenters requested the EPA provide clear guidance in the final rule addressing how PSD and title V issues resulting from GWP revisions should be handled.

Response: As the EPA noted in the preamble to the Tailoring Rule (75 FR 31514, June 3, 2010), the Tailoring Rule codifies Table A-1 to Subpart A of 40 CFR part 98 for the purpose of calculating emissions of CO₂e for determining Prevention of Significant Deterioration (PSD) and title V applicability for GHG (75 FR 31522). This approach was adopted in lieu of codifying IPCC values, which may change more frequently over time, and to provide certainty as to which GWP values need to be used. We explained, "[a]ny changes to Table A-1 of the mandatory GHG reporting rule regulatory text must go through an appropriate regulatory process. In this manner, the values used for the permitting programs will reflect the latest values adopted for usage by the EPA after a regulatory process and will be consistent with those values used in

¹⁷ Shindell, D. T., Faluvegi, G., Koch, D. M., Schmidt, G. A., Unger, N., & Bauer, S. E. (2009). Improved attribution of climate forcing to emissions. *Science*, 326(5953), 716-718.

¹⁸ E.g., U.S. Leadership on the Global Methane Initiative (<http://www.epa.gov/globalmethane/>) and Climate and Clean Air Coalition to Reduce Short-

Lived Climate Pollutants (<http://www.state.gov/r/pa/prs/ps/2012/02/184055.htm>).

the EPA's mandatory GHG reporting rule" (75 FR 31532). Furthermore, this Part 98 notice-and-comment process "will ensure advance notice of such a change" for sources that may be subject to the Tailoring Rule. See U.S. EPA, "Prevention of Significant Deterioration and Title V GHG Tailoring Rule: EPA's Response to Public Comments," May 2010 (Docket Id. No. EPA-HQ-OAR-2009-0517-19181), p. 101, n.5. Thus, as the EPA noted in the proposal to these Part 98 revisions, because permitting applicability is based partly on CO₂e emissions, an amendment to Table A-1 may affect program applicability for a source.

The EPA disagrees with the commenter who asserted that the EPA is changing the thresholds for major source determinations under the PSD and title V permitting programs in this rule. The Tailoring Rule references GWP values from Part 98 Table A-1 and uses them to calculate CO₂e emissions values, so the GWP changes in this final rule may affect the calculation of GHG emissions for individual sources relative to those thresholds. However, this final rule does not modify the major source thresholds of the PSD and title V permitting programs or any other EPA program, nor does it modify the "subject to regulation" thresholds for GHG established under the Tailoring Rule.

The EPA acknowledges that amendments to Table A-1 may result in an existing facility becoming subject to title V permitting. A stationary source may be a major source subject to title V permitting requirements solely on the basis of its GHG emissions, provided the source's emissions exceed the thresholds established in the Tailoring Rule. GHG emission sources that emit or have the potential to emit (PTE) at least 100,000 (tons per year) TPY CO₂e (calculated using GWPs), and also emit or have the PTE 100 TPY of GHGs on a mass basis (calculated without GWPs) are required to obtain a title V permit if they do not already have one.

While the EPA does not believe that many sources will change their title V applicability status as a result of this Table A-1 revision, it is conceivable that an existing source with a PTE just beneath the title V thresholds on a CO₂e basis may find that the revised GWP values result in a PTE calculation that makes the source a "major source" under title V. This determination would depend on what GHG compound(s) the source emits, the amount of the compound emitted, and if the GWP of the compound is increasing or decreasing. For example, a hypothetical source that emits only methane and no other GHG compounds or other

regulated NSR pollutants has a PTE of 90,000 TPY CO₂e in 2012 and is therefore not a title V major source. However, in 2014, once the new GWPs are effective for this hypothetical source, it could have emissions that make it a major source of GHG under title V, because its mass emissions are at least 100 TPY and its calculated PTE would be approximately 107,000 TPY CO₂e as a result of methane's GWP increasing from 21 to 25 (assuming the source does not take a restriction on its methane emissions).

A source applying for a title V permit for the first time must submit its permit application within 12 months after the source "becomes subject to the [operating] permit program" or such earlier time that the permitting authority may require (see 40 CFR 70.5(a)(1)). As the EPA noted in the title V Narrowing Rule,¹⁹ a source "becomes subject to" title V permitting when there is an EPA-promulgated or approved permit program "applicable to the source." See 75 FR 82259, n. 8; CAA section 503(a). Thus, the exact date that the new GWPs will become effective for purposes of title V applicability may vary, depending on the status of the applicable title V program as it relates to GHG sources and on how the GWPs are incorporated into the applicable title V permit program. For example, the federal part 71 permit program will begin using the revised GWPs upon the effective date of this rule, and some states may similarly have title V programs that automatically update the GWP values. However, other states may have approved title V programs that require revision to use the revised GWP values for title V permitting, or may even still lack authority to permit major sources of GHG under title V. In the example above, the hypothetical source of methane whose PTE calculation increased to 107,000 TPY CO₂e would have up to a year from becoming subject to title V permitting under the applicable title V program to submit an application for a title V operating permit.

A source may be able to avoid the requirement to have a title V permit if it has been issued a synthetic minor source permit that limits its PTE below the major source thresholds (including the CO₂e-based "subject to regulation" threshold) for title V applicability.²⁰ It

may be advisable for the terms of the synthetic minor permit to impose limits on GHGs on a mass basis, rather than a CO₂e basis (even where the purpose of the permit is to limit a source's PTE below 100,000 CO₂e). For such mass-based limits, a change in the GWP of the pollutant does not render the source out of compliance with the synthetic minor source limit, although the source may need to obtain a revised synthetic minor source limit to maintain its synthetic minor source status and avoid the need for a title V permit as a major source (*i.e.*, if the change in GWPs makes the source a title V major source under the conditions of the original minor source permit).

The EPA recognizes that there also may be synthetic minor source permit limits that are established solely in terms of CO₂e. This may occur at a source that emits multiple GHG compounds and seeks flexibility in managing its GHG emissions. In such cases, the source should analyze any permit and regulatory provisions governing the calculation of CO₂e for purposes of compliance with the permit. Even where the calculation of CO₂e under those provisions would change for a source, the EPA believes most sources will still be able to comply with its synthetic minor source permit because there is no GWP change for CO₂ and the change in GWP for the other GHG compounds is generally small. Thus, we do not expect the GWP revisions to significantly alter CO₂e emissions for most types of sources, particularly sources in which most of their GHG emissions result from fuel combustion. However, where a source anticipates difficulty in compliance with its synthetic minor source limit, it should work with its permitting authority to revise its permit to ensure compliance with the requirements of the permit and of title V.

The EPA also acknowledges that this action will affect the applicability of the PSD permit program for the proposed construction of new sources and proposed modifications of existing sources. As of the effective date of the Part 98 rule revisions, proposed sources and proposed modifications, including proposed PALs and PAL renewals, will need to calculate their GHG PTE and determine PSD applicability based on the revised GWPs. However, PSD permitting obligations should not be affected for a source or modification that has either already obtained a PSD permit or begun actual construction at a time when it was legitimately

¹⁹ Action To Ensure Authority To Implement Title V Permitting Programs Under the Greenhouse Gas Tailoring Rule (75 FR 82254, Dec. 30, 2010).

²⁰ In general, a source has up to one year to either apply for a title V permit, or be issued a synthetic minor permit to avoid title V applicability (but merely applying for a synthetic minor permit

within 12 months is not sufficient to avoid title V applicability).

considered a source that did not require a PSD permit (See 75 FR 51593–94, August 20, 2010). This approach is consistent with our PSD permitting regulations that provide: “[n]o new major stationary source or major modification to which the requirements of paragraphs (j) through (r)(5) of this section apply shall begin actual construction without a permit that states the major stationary source or major modification will meet those requirements” 40 CFR 51.166(a)(7)(iii); 40 CFR 52.21(a)(2)(iii). We do not interpret these provisions to prevent a source or modification from continuing construction when that source or modification has been legitimately determined not to trigger PSD permitting obligations and has begun actual construction before the effective date of the Part 98 regulations. Similarly, we do not interpret these provisions to prevent a source with a PSD permit issued before the Part 98 regulations become effective from beginning or continuing construction under that permit, as long as that permit has not expired.

Likewise, the GWP revisions should not affect past permitting actions for a source that has obtained a final PSD permit before these revisions to Part 98 become effective, regardless of whether or not that PSD permit included GHG limits. The EPA generally does not require reopening or revision of PSD permits that are issued prior to the effective date of a new requirement. See 75 FR 31593; Memorandum from John S. Seitz, Director OAQPS, New Source Review (NSR) Program Transitional Guidance, page 6 (March 11, 1991). Consistent with this approach, PSD permits based on earlier GWPs that are issued in final form prior to the effective date of these Part 98 rule revisions would not have to be revised or reopened solely due to the promulgation and effectiveness of these Part 98 rule revisions. Furthermore, compliance with final PSD permits that include BACT limits based on CO₂e, PALs based on CO₂e, and with other permit conditions that utilize GWPs from Table A–1 may be determined based on the GWPs that were in effect at the time of permit issuance (even if the permit does not specify the applicable GWP value).

While adoption of the Part 98 revisions will automatically apply in some PSD permit programs, other programs will have to engage in a state implementation plan (SIP) adoption process. Specifically, these new GWP values will apply immediately upon the effective date of this rule for PSD programs administered by EPA Regions and for those administered by

“delegated” states that rely upon 40 CFR 52.21, as well as in any state with a SIP that automatically updates when either 40 CFR sections 51.166 or 52.21 are revised (e.g., the state regulations incorporate by reference 40 CFR 52.21 without specifying an “as of” date of incorporation). However, some states will need to adopt the changes to the GWPs into their SIP before they become effective in their state permitting programs. This provides additional transitional time for sources in those states to comply with the required changes before the GWPs become effective in those states.

Likewise, as noted above, revisions to the GWPs will occur automatically for federal title V permitting. Some states may also have title V permit programs that automatically update, while other states may require revisions to their approved title V permit programs before the GWP revisions become effective for purposes of title V permitting.

Given the transitional times discussed above, we anticipate that most facilities will have a period to incrementally adjust to the changes in this final rule. Because development of the 2015 Inventory will rely in part on data from the GHGRP reports submitted in 2014, it is prudent for existing GHGRP reporters to calculate facility GHG emissions or supply using the revised GWPs in Table A–1 for their reporting year 2013 annual reports. Accordingly, the EPA is finalizing the schedule for the final amendments to Part 98 as proposed, and is not finalizing a transitional period. See Section III.A of this preamble for additional information.

Regarding the requests for the EPA to provide guidance, as we noted in the Response to Public Comments on the Tailoring Rule, “[i]n the event that we propose a change to GWP values, we will work with permitting authorities as necessary to provide guidance to sources on transitional issues” Docket Id. No. EPA–HQ–OAR–2009–0517–19181, p. 101 (footnote). A number of EPA offices, including OAQPS, have worked collaboratively in developing this response. Thus, in addition to the guidance provided in this preamble regarding the application of the Table A–1 revision to state PSD and title V programs and to previously-issued preconstruction permits, the EPA will continue to work with permitting authorities to address implementation concerns, as needed.

Comment: Several commenters expressed concern that the proposed rule appeared to propose retroactively applying amended GWPs to prior year reports. The commenters also stated that

the EPA did not provide a regulatory analysis of how retroactively applying GWPs would affect PSD or title V permitting obligations. Five commenters expressed concern that the proposed revisions to Table A–1 could result in enforcement actions associated with previous determinations under these regulatory programs. These commenters expressed concern that such a change would stall current permit projects and possibly reopen existing permits that were previously approved. In particular, some commenters were concerned about the impact on landfills, which require permits to install combustion devices for compliance under New Source Performance Standards (NSPS) and for landfill gas renewable energy projects. They recommended that the EPA clarify that any changes to the GWPs and GHG reporting requirements would not be applied retroactively to prior determinations made under PSD, title V, or any other regulatory programs that rely on the GWP values in Table A–1.

Response: The EPA did not intend to suggest in the proposed rule that the revised GWPs in Table A–1 would be retroactively applied under the PSD and title V permitting programs or for any other regulatory purpose. Thus, as explained above, PSD permits based on earlier GWPs that are issued in final form (to landfills or to other types of sources) prior to the effective date of these Part 98 rule revisions would not have to be revised or reopened solely due to the promulgation and effectiveness of these Part 98 rule revisions. Moreover, as to the commenter’s concern regarding the impact on landfills, we note that, generally because reductions in methane will be credited more highly in PSD applicability determinations, we would expect these project to be less, rather than more, likely to trigger PSD were the revised Table A–1 values to apply.

As discussed above, we do not see any cause to deviate from our historical practice of not requiring PSD permits to be reopened or amended to incorporate requirements that take effect after the permit is issued. With these considerations, the EPA does not expect the revised GWPs to be applied retroactively to prior PSD and title V permitting determinations made based on prior years’ GHG emissions, though these revisions will apply to permitting determinations made after the effective date of these Part 98 rule revisions, as described above. As such, we do not expect that facilities will be subject to the reopening of a previously approved PSD or title V permit solely based on

application of the amended GWPs in Table A-1 to prior years' emissions.

For example, assume that a new major stationary source gets a PSD permit in 2011, undergoing a BACT analysis for GHGs. The permit that establishes the source's CO₂e emission limit(s) are based on the Table A-1 values that are in place at the time of permit issuance (i.e., from the 2009 GHG reporting rule). In 2014, after the effective date of the 2013 Table A-1 revisions, the source would continue to determine compliance with their PSD permit by the original permit conditions that based applicability and BACT limits on the GWP values in the 2009 GHG reporting rule. Then, in 2015, the company submits a PSD permit application to undergo a modification at the source. In order to determine PSD applicability for the project, the applicant and permitting authority should use the most updated values of GWPs that are in effect, which at this point would be the GWP values in the 2013 Table A-1 revisions. Assuming that this source is in a state that automatically updates its SIP when the federal rules are amended, it would determine its emissions increase from the 2015 proposed modification (e.g., "baseline actual emissions" and "projected actual emissions") by using the GWP values in the 2013 Table A-1 revisions.

Comment: Several commenters expressed concerns with how state and regional programs that rely on the GWP values in Part 98 may be affected by the EPA's revisions to Table A-1. One commenter was particularly concerned about the potential of increased complexity in comparing emissions between programs and between reporting years. For example, the commenter notes that some states have incorporated the GWP values in Part 98 into their state reporting programs to reduce the reporting burden. The commenter explained that these states will either have to propose and approve rule changes to update their GWP values to match those in Part 98 or certain facilities will be required to report two sets of CO₂e data: One to the EPA and one to the state or local program. The commenter recommends that, in order to ensure consistent reporting across federal, state and regional reporting programs, the agency must ensure that the reporting revisions currently and in the future are well-coordinated with state and local reporting programs.

Response: As noted in the preamble to the final 2009 Part 98 (74 FR 56260), the EPA has intended to periodically update Table A-1 when GWP values are evaluated or re-evaluated by the

scientific community. The revised GWP values in Table A-1 will likely result in changes to the CO₂e estimates of GHGs emitted or supplied. As noted by the commenters, the revisions may affect the state and regional programs that rely on the GWP values in Table A-1. The EPA recognizes the importance of state and local GHG programs in evaluating regional GHG emissions and in implementing GHG reduction strategies. In reviewing Table A-1, the EPA considered the benefits of having consistent GWPs across federal, state, and regional programs. In particular, we recognize that using consistent GWPs across these programs increases the ease with which agencies can analyze local emissions in light of national estimates. As discussed in Section II.A.2.a of this preamble, the EPA balanced the benefits of updating the GHGRP GWPs to more current values with the U.S. commitment to maintain consistency with values used by the UNFCCC and the values used in other U.S. climate programs. The EPA's primary goal in updating Table A-1 is to ensure that the GHGRP incorporates scientific advances in climate science to better inform EPA policies and programs. As noted previously, we recognize that frequent updates to Table A-1 may cause confusion or create difficulties with reviewing prior year data based on different GWP values. Because of these concerns, we do not intend to update Table A-1 frequently (see Section II.A.2.a of this preamble for additional information). Although the EPA anticipates making periodic updates that increase the accuracy of the GHGRP, we anticipate balancing the frequency of these changes with the impacts to federal, state, and local programs.

We note that the applicability, compliance schedule, calculation methodologies, or any other requirements established under these non-Part 98 programs are outside the scope of these amendments. Concerns related to implementation and compliance with other state and regional programs that rely on Table A-1 cannot be addressed through Part 98. However, the EPA intends to work with state and regional programs to address implementation concerns. As noted in the response above, it is likely that some PSD SIPs will need to be revised as a result of this action, since some state rules do not automatically update when Part 98 is updated.

3. Summary of Other Corrections and Final Amendments to Subpart A

In addition to the amendments to global warming potentials in Table A-

1, we are also finalizing corrections and other clarifications to certain provisions of subpart A of Part 98. The more substantive corrections, clarifying, and other amendments to subpart A are found here. We are finalizing all of the minor corrections to subpart A presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA-HQ-OAR-2012-0934).

The EPA has finalized, with revisions, the amendment to require facilities to report their latitude and longitude if the facility does not have a physical street address. The EPA received comment that the rule should specify the precise latitude and longitude that should be reported (i.e., centroid of the plant or part of the "administration building"). As a result of this comment we revised the requirement to clarify that facilities required to submit a latitude and longitude should report the geographic centroid or center point of the facility.²¹

The final amendments replace the proposed term, "ORIS code," with the term "plant code," and the proposed definition has been revised to include both facilities that have been assigned a Plant ID code by the Department of Energy's (DOE) Energy Information Administration (EIA) and those have not been assigned this code but that otherwise report to EPA's Clean Air Markets Division (CAMD) and so have been assigned a plant code by CAMD. The final amendments reflect a definition of "plant code" under 40 CFR 98.6 that is largely derived from the definition of this term on the Certificate of Representation (EPA Form 7610-1 (Revised 8-2011))²² that is used for domestic NO_x and SO₂ trading programs. The associated reporting requirement that was originally proposed at 40 CFR 98.3(c)(13) has been divided into a general facility-level reporting requirement under subpart A (to identify reporters who have been assigned a plant code) and configuration-level requirements to report the code under subparts C and D.²³

The EPA is not finalizing the definition of "Fluidized Bed Combustor (FBC)" because the associated subpart C emissions factors are not being finalized at this time. See Section II.B of this

²¹ We are finalizing confidentiality determinations for the revised data element in 40 CFR 98.3(c)(1). See Section V of this preamble for additional information.

²² Available at <http://www.epa.gov/airmarkets/business/docs/forms/CertofRepFINAL.pdf>.

²³ We are finalizing confidentiality determinations for the new data elements in 40 CFR 98.3(c)(13) and 40 CFR 98.36. See Section V of this preamble for additional information.

preamble for more information about the FBC-specific emission factors.

We are finalizing a provision, as proposed, to include instructions for the reporting of a United States parent company legal name and address. The final amendments to the parent company reporting requirements under 40 CFR 98.3(c)(11)(viii) reflect that reporters are required to use any common naming rules or guidelines provided via the Electronic Greenhouse Gas Reporting Tool (e-GGRT) in formatting and submitting their parent company names. This will ensure consistent reporting of a given parent company name between different facilities with that parent company and transparency of which facility's or supplier's emissions may, in whole or in part, be attributed to a given parent company. This amendment is being finalized as proposed.

The EPA is also finalizing the following amendments as proposed. We are amending 40 CFR 98.3(h)(4) to clarify the provisions for requesting an extension of the 45-day period for submission of revised reports in 40 CFR 98.3(h)(1) and (2). Finally, we are revising the definitions of "degasification system", "ventilation well or shaft", and "ventilation system" to more closely align with common terminology used in the coal mining industry (subpart FF).

4. Summary of Comments and Responses—Other Corrections and Amendments to Subpart A

This section summarizes the significant comments and responses related to the proposed corrections and amendments to subpart A. See the comment response document for subpart A in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart A.

Comment: Many commenters supported the requirement for electricity generators to report their ORIS codes, but requested clarifications or revisions to the proposal. Commenters pointed out that the definition should be revised to indicate that ORIS codes can have up to five digits, and several commenters pointed out that the proposed definition reflects that these codes are plant-level attributes while the proposed language of the reporting requirement described the codes as unit-level attributes. One commenter recommended that the rule clearly restrict the ORIS code reporting requirement to power plants which are subject to both EIA's Form 860 reporting requirements and to 40 CFR part 98. Another commenter stated that the

proposal would require operators to report the same ORIS code for each unit at a single facility.

Response: The final amendments do not define the term "ORIS code" but instead define the term "plant code" based largely on the following definition from the Certificate of Representation (EPA Form 7610-1 (Revised 8-2011)) used for the EPA's NO_x and SO₂ trading programs:

A plant code is a 4 or 5 digit number assigned by the Department of Energy's (DOE) Energy Information Administration (EIA) to facilities that generate electricity. For older facilities, "plant code" is synonymous with "ORISPL" and "Facility" codes. If the facility generates electricity but no plant code has been assigned, or if there is uncertainty regarding what the plant code is, send an email to the EIA. The email address is EIA-860@eia.gov. For facilities that do not produce electricity, use the facility identifier assigned by EPA (beginning with "88").

Due to the recurring comment that an ORIS code is a plant-level attribute that was proposed as a unit-level reporting requirement, the final amendments clarify that the plant code should, in fact, be reported at the unit-level or configuration-level under Part 98 because of differences between EIA conventions for delineating plant-sites and the definition of "facility" under 40 CFR 98.6. Reporting of the plant code at the unit-level or configuration-level is necessary because some groups of combustion units that are under common control are considered to be multiple plant-sites by EIA. For example, the generating facility assigned EIA plant code 3250 is a generating plant with 12 peaking units that is adjacent to a base load plant assigned EIA plant code 3251. Because these two EIA plant-sites are adjacent and owned by the same utility company, they are considered a single "facility" as that term is defined in 40 CFR 98.6. While one commenter's statement that all units at a single facility would report the same ORIS code is valid for the majority of Part 98 facilities, this statement is not universally valid. The final rule clarifies these points. However, because plant codes are being treated as unit-level attributes under Part 98, the associated reporting requirements are being promulgated with other unit-level requirements under subpart C.

Comment: Two commenters expressed concern that the EPA would use the new provision in 40 CFR 98.3(c)(11)(vii) to assign parent companies to a given facility or supplier or make changes to a facility or supplier's certified report after it is submitted. It was also noted that the EPA did not indicate if the company

naming convention would be revised for previously submitted reports or only apply to reports submitted going forward.

Response: The EPA notes that the proposed language "standardized conventions for the naming of a parent company" refers to the style guide currently referenced as a suggested template for parent company reporting in e-GGRT. This style guide covers items such as common punctuation and abbreviation use in parent company names and is included to avoid having facilities with the same parent company report that parent company in different formats (i.e. ABC Corp. vs. ABC Corporation vs. A.B.C. Corp.). The list of parent companies provided in e-GGRT provides a list of company names that are already formatted in-line with the style guide. Currently, reporters have the option to use a parent company name on the provided list or enter a separate parent company name if their parent company is not listed on the provided list. Those two options would remain in place with this change, and reporters will not be limited to only selecting a parent company from the list provided in e-GGRT. This change does require that, if a reporter does not choose a company on the list provided in e-GGRT, they must follow the style guide to ensure their parent company name is entered in a manner consistent with other reporters. Again, the style guide is limited to formatting requirements, such as punctuation and abbreviation (i.e., U.S. vs. US vs. United States).

This change does not give the EPA permission to alter the parent company information certified and submitted by reporters. If, in the process of future report verification, EPA notes that the style guide was not followed, then the EPA may ask the reporter to correct the parent company name to adhere to the format in the style guide. In this situation, the reporter would make any changes to the reported parent company name, not EPA. The EPA does not intend to require resubmission of reports for previous years solely to update the parent company name to comply with this new provision.

The conventions in the style guide are consistent with other EPA programs, such as the Toxics Release Inventory, which provides consistency for those parent companies that report under multiple programs. For the reasons and clarifying statements mentioned above, the EPA is finalizing this regulatory text change as proposed.

Comment: One commenter objected to EPA's proposal to revise the parent company requirements under 40 CFR

98.3(c)(11) without first completing a revised Information Collection Request (ICR).

Response: The regulatory text related to standardizing of parent company names does not add any new reporting requirements to subpart A. Rather, it clarifies the format used for submitting parent company names under 40 CFR 98.3(c)(11) to provide consistency for both reporters and the public viewing the data. Because this change is a formatting change for an existing requirement, the EPA has determined an ICR amendment is not required.

B. Subpart C—General Stationary Fuel Combustion Sources

1. Summary of Final Amendments

We are generally finalizing revisions to the requirements of 40 CFR part 98, subpart C (General Stationary Fuel Combustion Sources) as proposed. The revisions clarify the use of the Tier methodologies and update high heat value (HHV) and emission factors for several fuels. The more substantive corrections, clarifying, and other amendments to subpart C are found here. We are finalizing all of the minor corrections to subpart C presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA-HQ-OAR-2012-0934).

First, we are finalizing a change to 40 CFR 98.33(b)(1), as proposed, that will allow the Tier 1 methodology to be used for Table C-1 fuels that are combusted in a unit with a maximum rated heat input capacity greater than 250 million Btus per hour, if the fuel provides less than 10 percent of the annual heat input to the unit and the use of Tier 4 is not required.

As previously discussed in Section II.A.3 of this preamble, the proposed requirement for certain facilities to report their plant code(s) (as defined under 40 CFR 98.6) is being finalized as unit-level and configuration-level reporting requirements under subpart C. The final amendments require reporting of this code at the unit-level or configuration-level in the applicable methodology-specific paragraphs in subpart C (i.e., paragraphs for Tiers 1–3, Tier 4, common pipe, common stack, aggregation of units, and Part 75 reporting methodologies) in order to facilitate cross-referencing GHGRP data with other publicly available state and federal data resources. The plant code reporting requirement applies to each stationary combustion source (i.e., each individual unit and each group of units reported as a configuration) that includes at least one combustion unit that has been assigned a plant code.

We are not finalizing the proposed change to the default biogenic fraction of CO₂ for MSW. After consideration of public comments, the EPA performed an analysis that supports retaining the existing default MSW biogenic CO₂ fraction of 0.6. (See “Analysis of Default Biogenic CO₂ Fraction for Municipal Solid Waste (MSW)”, June 24, 2013 in Docket Id. No. EPA-HQ-OAR-2012-0934).

We are revising Table C-1 as proposed to update the HHV and/or emission factors for several fuels. The amendments to Table C-1, as discussed in the memorandum “Review and Evaluation of 40 CFR Part 98 CO₂ Emission Factors for EPW07072 To 45” (see Docket Id. No. EPA-HQ-OAR-2012-0934), include: (1) Replacing “Wood and Wood Residuals” with “Wood and Wood Residuals (dry basis),” with a footnote containing an equation that can be used to adjust the HHV value for any moisture content; (2) replacing “Biogas (captured methane)” with two types of biogas: “Landfill Gas” and “Other Biomass Gases;” (3) revising the HHV and/or emission factors for liquid petroleum gases (LPG) and LPG components including propane, ethane, ethylene, isobutane, isobutylene, butane, and butylene; (4) correcting the emission factor for coke and revising the name to “coal coke” to differentiate it from “petroleum coke;” (5) updating emission factors for the four types of coal and the four types of mixed coals; (6) revising the HHV for the biomass fuel “solid byproducts;” and, (7) finalizing minor changes to the HHV and/or emission factors for natural gas, used oil, natural gasoline, petrochemical feedstocks, unfinished oils, crude oil, and tires.

We are revising Table C-2 to add CH₄ and N₂O emission factors for “fuel gas” and “wood and wood residuals”, as proposed.

The EPA is not finalizing the proposed addition of waste coals (waste anthracite (culm) and waste bituminous (gob)) to Table C-1, and is not finalizing the proposed FBC-specific N₂O emission factors for coal and waste coal to Table C-2. As discussed in the preamble to the proposed rule, the EPA reviewed multiple studies that indicate N₂O emissions from these units when burning coal and waste coal are significantly higher than from conventional combustion technologies. We received comments that included additional data, which is discussed in Section II.B.2 of this preamble. The EPA will study this data to inform any future rulemaking to address this issue.

2. Summary of Comments and Responses

This section summarizes the significant comments and responses related to the proposed amendments to subpart C. See the comment response document for subpart C in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart C.

Comment: Two commenters stated that the Wojtowicz study²⁴ used by the EPA to develop the proposed N₂O emission factors for FBCs is not relevant to the large-scale FBC systems that are subject to Part 98. These commenters also provided a field study²⁵ of FBC emissions conducted by R.A. Brown, et al. Because the Brown study documents N₂O emission rates that are lower than the proposed emission factors, these commenters expressed concerns that the proposed N₂O emission factors will over estimate emissions from FBCs, and they concluded that the underlying Wojtowicz study should not be used to develop emission estimates for large-scale FBC systems. These commenters also believe that the EPA did not include in the docket a detailed description of the methodology used to derive the N₂O emission factors from the Wojtowicz study.

Response: The EPA appreciates the N₂O emissions and operating data from the Brown study provided by the commenters. We are not finalizing the proposed FBC-specific emission factors to allow time to study the additional data provided with the comments.

Comment: Several commenters disagreed with the EPA’s proposal to reduce the default MSW biogenic CO₂ fraction from 0.60 to 0.55 and requested that the EPA use the actual MSW fractions reported by all municipal waste combustors (MWCs) for the first three years of the GHGRP (2010–2012) to determine an appropriate default.

Response: In response to these comments, the EPA performed an analysis of all quarterly MSW biogenic CO₂ fractions (determined using ASTM D7459-08 and ASTM D6866-08) submitted through the GHGRP in reporting years 2010 through 2012. Quarterly MSW biogenic CO₂ fractions were averaged for each MWC to determine each unit’s annual average MSW biogenic CO₂ fraction. The weighted average (based on the reported

²⁴ M.A. Wojtowicz, et al., *Combustion of Coal as a Source of N₂O Emission*, 34 Fuel Processing Tech. 1(1993), EPA-HQ-OAR-2012-0934-0029.

²⁵ R.A. Brown, et al., *N₂O Emissions from Fluidized Bed Combustion*, Proceedings of the 11th International Meeting on Fluidized Bed Combustion, March 1991.

unit level biogenic CO₂ emissions) for all MWC annual averages was determined to be 0.62. The result of this analysis supports retaining the existing default MSW biogenic CO₂ fraction of 0.60. (See “Analysis of Default Biogenic CO₂ Fraction for Municipal Solid Waste (MSW)”, June 24, 2013 in Docket Id. No. EPA-HQ-OAR-2012-0934).

C. Subpart H—Cement Production

We are finalizing one revision to the reporting requirements of 40 CFR part 98, subpart H (Cement Production), as proposed. We are amending 40 CFR 98.86(a)(2) to require reporting of facility-wide cement production. This change will provide consistency in the reporting requirements for facilities using continuous emissions monitoring system (CEMS) and not using CEMS. The EPA received one comment supporting the proposed change to subpart H.

D. Subpart K—Ferroalloy Production

We are finalizing two corrections to subpart K of Part 98 (Ferroalloy Production) as proposed. First, we are correcting Equation K-3 to revise the numerical term “2000/2205” to “2/2205”. Next, we are amending 40 CFR 98.116(e) to require the reporting of the annual process CH₄ emissions (in metric tons) from each electric arc furnace (EAF) used for the production of any ferroalloy listed in Table K-1 of subpart K of Part 98. These amendments are necessary for consistent reporting of CH₄ emissions from all ferroalloy production facilities. The EPA received no comments on the proposed changes to subpart K.

E. Subpart L—Fluorinated Gas Production

The EPA is amending subpart L of Part 98 (Fluorinated Gas Production) to extend temporary, less detailed reporting requirements for fluorinated gas producers for an additional year, as proposed. The extension requires the same less detailed reporting for reporting year 2013 as for reporting years 2011 and 2012. The extension allows the EPA, as well as stakeholders, to consider the various options for reporting emissions under subpart L. We are finalizing all of the minor corrections to subpart L presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA-HQ-OAR-2012-0934). The EPA received no comments objecting to the proposed changes to subpart L.

F. Subpart N—Glass Production

We are finalizing several clarifying revisions to subpart N of Part 98 (Glass

Production) as proposed. The more substantive corrections, clarifying, and other amendments to subpart N are found here. We are finalizing all of the minor corrections to subpart N presented in the Table of 2013 Revisions as proposed. The EPA received no comments objecting to the proposed changes to subpart N.

We are revising 40 CFR 98.144(b) as proposed to specify that reporters determining the carbonate-based mineral mass fraction must use sampling methods that specify X-ray fluorescence.

Additionally, we are removing ASTM D6349-09 and ASTM D3682-01 from the requirements in 98.144(b) as proposed. These amendments allow reporters flexibility in choosing a sampling method (because multiple X-ray fluorescence methods are available). For measurements made in the emission reporting year 2013 or prior years, reporters continue to have the option to use ASTM D6349-09 and ASTM D3682-01. Reporters are not required to revise previously submitted annual reports. Facilities have the option, but are not required, to use the newly proposed option for the reports submitted to EPA in 2013.

G. Subpart O—HFC-22 Production and HFC-23 Destruction

The EPA is finalizing clarifying amendments and other corrections to subpart O (HFC-22 Production and HFC-23 Destruction) as proposed. The more substantive corrections, clarifying, and other amendments to subpart O are found in this section. We are finalizing all of the minor corrections to subpart O presented in the Table of 2013 Revisions as proposed.

We are adding a sentence to 40 CFR 98.156(c) to clarify how to report the HFC-23 concentration at the outlet of the destruction device in the event that the concentration falls below the detection limit of the measuring device. The final rule clarifies that in this situation, facilities are required to report the detection limit of the measuring device and that the concentration was below that detection limit. The EPA received no comments on the proposed changes to subpart O.

H. Subpart P—Hydrogen Production

1. Summary of Final Amendments

The EPA is finalizing the corrections and clarifications to subpart P as proposed. The more substantive corrections, clarifying, and other amendments to subpart P are found here. Additional minor corrections, including minor edits to the final rule,

are presented in the Table of 2013 Revisions (see Docket Id. No. EPA-HQ-OAR-2012-0934). The EPA received no comments objecting to the proposed changes to subpart P.

We are finalizing 40 CFR 98.163(b), as proposed, to clarify that when the fuel and feedstock material balance approach is followed, the average carbon content and molecular weight for each month used in Equations P-1, P-2, or P-3 may be based on analyses performed annually or analyses performed more frequently than monthly (based on the requirements of 40 CFR 98.164(b)). Additionally, we are revising the term definitions in Equations P-1, P-2, and P-3 to remove references to the frequency of analyses in equation terms “CC_n” and “MW_n” in Equation P-1 and equation term “CC_p” in Equations P-2 and P-3, since the analysis frequencies are not described in the introductory text at 40 CFR 98.163(b), as discussed above.

The final amendments to subpart P include revising the equation term “Fdstck_n” in Equations P-1 and P-2 and revising the language in paragraphs 40 CFR 98.166(b)(2) and (b)(5). These changes optionally allow the gaseous or liquid feedstock quantity to be measured on a mass basis in addition to the already-specified volumetric basis. The change to the equation term “Fdstck_n” is consistent with changes made to subpart X, and allows the results from flow meters that measure gas and liquid materials on a mass basis to be used directly in Equation P-1 or P-2 without first having to perform unit conversions. All changes add flexibility for reporters, and should lead to fewer reporting errors.

We are modifying 40 CFR 98.164(b)(5) as proposed by allowing a facility to analyze fuels and feedstocks using chromatographic analysis, whether continuous or non-continuous. Additionally, we are moving recordkeeping requirements 40 CFR 98.164(c) and (d) to new paragraphs 40 CFR 98.167(c) and (d) in 40 CFR 98.167 (Records that must be retained). Finally, we are revising 40 CFR 98.166(a)(2) and (a)(3) to remove the requirement to report hydrogen and ammonia production for all units combined. These amendments are finalized as proposed. The EPA received no comments objecting to the proposed changes to subpart P.

2. Summary of Comments and Responses

See the comment response document in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to

subpart P. The EPA received only supportive comments for subpart P, therefore, there are no changes from proposal to the final rule based on these comments.

I. Subpart Q—Iron and Steel Production

1. Summary of Final Amendments

The EPA is finalizing clarifying amendments to subpart Q (Iron and Steel Production) as proposed. The more substantive corrections, clarifying, and other amendments to subpart Q are found here. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA-HQ-OAR-2012-0934).

We are amending the definition of the iron and steel production source category in subpart Q, 40 CFR 98.170, as proposed, to include direct reduction furnaces not co-located with an integrated iron and steel manufacturing process. We are amending Equation Q-5 in subpart Q to account for the use of gaseous fuels in EAFs. Specifically, we are modifying Equation Q-5 by adding terms to account for the amount of gaseous fuel combusted and the carbon content of the gaseous fuel. We are also amending Equation Q-5 by correcting the term “ C_f ” to “ C_{flux} ” and the term “ C_c ” to “ C_{carbon} ” to match those presented in the definitions, and to add a closing bracket at the end of the equation. These amendments are finalized as proposed.

We are revising 40 CFR 98.173(d) as proposed to clarify when the Tier 4 calculation methodology must be used to calculate and report combined stack emissions. The amendment clarifies that the Tier 4 calculation methodology should be used (and emissions reported under subpart C of Part 98) if the GHG emissions from a taconite indurating furnace, basic oxygen furnace, non-recovery coke oven battery, sinter process, EAF, decarburization vessel, or direct reduction furnace are vented through a stack equipped with a CEMS that complies with the Tier 4 methodology in subpart C of this part, or through the same stack as any combustion unit or process equipment that reports CO₂ emissions using a CEMS that complies with the Tier 4 Calculation Methodology in subpart C.

We are amending 40 CFR 98.174(c)(2) as proposed by removing the term “furnace” from the statement “For the furnace exhaust,” because decarburization vessels are not furnaces. We are also amending 40 CFR 98.174(c)(2) by dividing (c)(2) into two separate sub paragraphs to separately specify the sampling time for

continuously charged EAFs. We are removing the term “production cycles” for continuous EAFs and provide owners or operators with the option of sampling for a period spanning at least three hours. These amendments are finalized as proposed.

We are amending 40 CFR 98.175(a) as proposed to clarify that 100 percent data availability is not required for process inputs and outputs that contribute less than one percent of the total mass of carbon into or out of the process. Similarly, we are finalizing the amendment to 40 CFR 98.176(e) clarifying that the reporting requirements of 40 CFR 98.176(e) do not apply to process inputs and outputs that contribute less than one percent of the total mass of carbon into or out of the process.

2. Summary of Comments and Responses

See the comment response document in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart Q. The EPA received only supportive comments for subpart Q, therefore, there are no changes from proposal to the final rule based on these comments.

J. Subpart W—Petroleum and Natural Gas Systems

The EPA is amending subpart W to incorporate minor revisions to three equations for consistency with the revisions to Table A-1 that we are finalizing in this action. The subpart W calculations for annual mass of GHG emissions for gas pneumatic device venting and natural gas driven pneumatic pump venting in CO₂e are calculated using a conversion factor that was developed using the methane GWP from Table A-1. The affected equations are Equation W-1, which calculates the mass of CO₂e using a conversion factor (Conv_i) that is developed from the methane GWP; Equation W-2, which also calculates the mass of CO₂e using a conversion factor (Conv_i) that is developed from the methane GWP; and Equation W-36 in 40 CFR 98.233(u)(2)(v), which incorporates numeric GWPs for CH₄ and N₂O. Because the GWP values that inform the methane calculations in these three equations reference the previous GWP value, each equation needs to be amended separately to change the numeric GWP. While the EPA proposed that the new GWP apply throughout all of Part 98, the EPA did not specifically propose amendments to the regulatory text referencing the numeric GWP in these three discrete equations. In

addition to finalizing the GWP value for methane in Table A-1, we are also amending the methane conversion factor and methane GWP used in these three subpart W equations to ensure the correct GWP value for methane in Table A-1 is used in these calculations.

K. Subpart X—Petrochemical Production

1. Summary of Final Amendments

The EPA is finalizing corrections and clarifications to subpart X. The more substantive corrections, clarifying, and other amendments to subpart X are found here. Additional minor corrections to subpart X, including changes to the final rule, are discussed in the Table of 2013 Revisions (see Docket Id. No. EPA-HQ-OAR-2012-0934).

We are finalizing several amendments to subpart X as proposed. We are revising the calculation methodology in 40 CFR 98.243(b) for CH₄ and N₂O emissions from burning process off-gas for reporters using the CEMS method to determine CO₂ emissions; the revision requires reporters to use Equation C-10 of subpart C of Part 98. Reporters must use the cumulative annual heat input from combustion of the off-gas (mmBtu) and fuel gas emission factors from Table C-2 to calculate emissions of CH₄ and N₂O. We are revising 40 CFR 98.243(c)(3) and 40 CFR 98.244(b)(4) to allow subpart X reporters that use the mass balance calculation method to obtain carbon content measurements from a customer of the product. Additionally, we are revising 40 CFR 98.243(c)(4) to allow the alternative sampling requirements to be used during all times that the average monthly concentration is above 99.5 percent of a single compound for reporters using the mass balance calculation method. We are also replacing the Equation X-1 parameters “(MW_f)_i” and “(MW_p)_i” with parameters “(MW_f)_{i,n}” and “(MW_p)_{i,n}”, respectively, and adding the associated equation term definitions, and revising the definitions for the terms “C_g”, “(F_{gr})_{i,n}” and “(P_{gp})_{i,n}” in Equation X-1 as proposed.

We are revising the test method description for chromatographic analysis in 40 CFR 98.244(b)(4)(xiii) to remove the word “gas”. We are also modifying 40 CFR 98.244(b)(4)(xv) to allow additional methods for the analysis of carbon black feedstock oils and carbon black products. We are revising the missing data procedures in 40 CFR 98.245 to clarify that the procedures for missing fuel carbon contents in 40 CFR 98.35(b)(1) are to be used only for missing feedstock and

product carbon contents, and the procedures for missing fuel usage in 40 CFR 98.35(b)(2) are to be used to develop substitute values for missing feedstock and product flow rates. We are also adding missing data requirements for missing flare data and for missing molecular weights for gaseous feedstocks and products. These amendments are finalized as proposed.

We are finalizing two amendments to clarify the reporting requirements of 40 CFR 98.246(a)(6) for reporters using the mass balance method. Specifically, we are amending 40 CFR 98.246(a)(6) to require reporters to report the name of each method that is used to determine carbon content or molecular weight in accordance with 40 CFR 98.244(b)(4). We are also requiring reporters to describe each type of device used to determine flow or mass (e.g., flow meter or weighing device) and identify the method used to determine flow or mass for each device in accordance with 40 CFR 98.244(b)(1) through (b)(3). We are revising 40 CFR 98.246(a)(8) to specify that reporters using the mass balance calculation method must identify combustion units outside of the petrochemical process unit that burned process off-gas. These amendments are finalized as proposed.

As proposed, we are removing the requirements in 40 CFR 98.246(b)(4) and (b)(5) to report CO₂, CH₄, and N₂O emissions from each CEMS location and the requirement to report the aggregated total emissions from all CEMS locations. In 40 CFR 98.246(b)(5) we are removing the requirements to report inputs to Equation C–8. Instead of the Equation C–8 inputs, reporters will report the total annual heat input for Equation C–10, as required in 40 CFR 98.35(c)(2). Finally, we are removing the requirement to identify each stationary combustion unit that burns petrochemical process off-gas. These amendments are finalized as proposed.

The final amendments include several changes to proposed language to better reflect our intent but that do not change the underlying requirement. For example, a proposed change in 40 CFR 98.242(b)(2) specified that emissions from burning petrochemical process off-gas in any combustion unit are not to be reported under subpart C. The final amendments clarify that “any combustion unit” includes combustion units that are not part of the petrochemical process unit.

The final amendments to subpart X include changes to the proposed quality assurance/quality control (QA/QC) requirements for flare gas monitoring instruments. After consideration of a public comment, we are specifying in

the final amendments (40 CFR 98.244(c)) that reporters using the methodology in 40 CFR 98.243(b) or (d) must be complying with all applicable QA/QC requirements in 40 CFR 98.254(b) through (e) for flare gas monitoring instruments beginning no later than January 1, 2015. The proposed amendments did not specify when reporters would be required to comply with these requirements. The final amendments also clarify that QA/QC requirements for flare gas monitoring instruments apply in the same manner as under other subparts such as subpart Y. Specifically, if a facility has installed a flare gas monitor, then specified QA/QC requirements apply to that monitor. However, if the reporter estimates a flare gas characteristic based on engineering records or other information, as allowed under 40 CFR 98.253(b)(1) through (b)(3), then the QA/QC requirements in 40 CFR 98.254(b) through (e) do not apply.

The final amendments include changes to clarify the reporting requirements in 40 CFR 98.246(a)(9) for reporters using the alternative to sampling and analysis in 40 CFR 98.243(c)(4). The proposed changes to this section addressed various reporting requirements related to off-spec production of a product. The final amendments clarify that the off-spec production reporting requirements apply only if the alternative methodology is being used for the product in question. The purpose of the off-spec reporting is to ensure that appropriate carbon content values are being used. Carbon content of a feedstock is not affected by process upsets that result in off-spec product. Thus, there is no need to report off-spec product when the alternative methodology is being used only for a feedstock. This section of subpart X also requires reporting of the dates of any process changes that reduce the composition of the primary component in the subject stream to less than 99.5 percent. According to 40 CFR 98.243(c)(4), the alternative methodology is not allowed if the “average monthly” concentration falls below 99.5 percent. Thus, to make the two sections consistent, the final amendments to 40 CFR 98.246(a)(9) require reporting of dates of process changes that cause the “monthly average” composition to fall below 99.5 percent.

The final amendments also include changes to 40 CFR 98.246(b)(4). The proposed amendments to this section required reporting of an estimate of the fraction of total CO₂ emissions measured by the CEMS that is

“attributable to the petrochemical process unit.” After further consideration, we determined that the term “attributable to” may be ambiguous. Therefore, the final amendments clarify that the emissions to use in estimating the fraction include both CO₂ directly emitted by the process plus CO₂ generated by combustion of off-gas from the petrochemical process unit.²⁶ The final amendments also include several additional changes throughout subpart X to replace incorrect paragraph references as well as to fix formatting, typographical, and grammatical errors. All of these changes, as well as the changes that are described in more detail above, are presented in the Table of Revisions to this rulemaking (see Docket Id. No. EPA–HQ–OAR–2012–0934).

The EPA received two suggested revisions for subpart X that are beyond the scope of this rulemaking. These included a request to report vinyl chloride monomer production in lieu of ethylene dichloride production, and a request for alternative options for determining and reporting carbon content of small feedstock streams (streams that constitute less than 0.5% of the total feedstock flow on an annual basis). Although we are not including the suggested revisions in this final rule, the EPA is considering these comments for inclusion in a future rulemaking. See the comment response document for subpart X in Docket Id. No. EPA–HQ–OAR–2012–0934 for additional information.

2. Summary of Comments and Responses

This section summarizes the significant comments and responses related to the proposed amendments to subpart X. See the comment response document for subpart X in Docket Id. No. EPA–HQ–OAR–2012–0934 for a complete listing of all comments and responses related to subpart X.

Comment: One commenter stated that the EPA should provide additional time for reporters to add any existing flare gas monitoring instrumentation to the GHG Monitoring Plan and into existing maintenance database systems to ensure that they are calibrated in accordance with the new QA/QC requirements in 40 CFR 98.244(c). The commenter stated that the compliance date should be no earlier than July 1, 2014.

Response: We agree with the commenter that some time is needed for

²⁶ We are finalizing confidentiality determinations for the revised data element in 40 CFR 98.246(b)(4). See Section V of this preamble for additional information.

reporters to modify their monitoring plans and maintenance systems if they are not already implementing procedures consistent with the new requirements. Although compliance could be achieved any time during a year, for reporting purposes we have set the compliance date at the beginning of a reporting year. While we considered setting the compliance date on January 1, 2014, we determined that that date would not provide sufficient time for all facilities to come into compliance with these requirements. We determined that January 1, 2015 would provide sufficient time for all facilities to come into compliance regardless of the number of flares they use or the number of monitoring instruments that they use.

L. Subpart Y—Petroleum Refineries

1. Summary of Final Amendments

The EPA is finalizing changes, technical corrections, and clarifying amendments to subpart Y (Petroleum Refineries) as proposed. The more substantive corrections, clarifying, and other amendments to subpart Y are found here. Additional minor corrections, including changes to the final rule, are presented in the Table of 2013 Revisions (see Docket Id. No. EPA-HQ-OAR-2012-0934).

As proposed, we are revising in 40 CFR 98.252(a) the reference to the default emission factors for “Petroleum (All fuel types in Table C–1)” to “Fuel Gas” and in 40 CFR 98.253(b)(2) and (b)(3) from “Petroleum Products” to “Fuel Gas” for calculation of CH₄ and N₂O from combustion of fuel gas.

We are revising 40 CFR 98.253(f)(2), (f)(3), and (f)(4) and the terms “F_{SG}” and “MF_c” in Equation Y–12 as proposed to clarify the calculation methods for sulfur recovery plants to address both on-site and off-site sulfur recovery plants. We are also revising the reporting requirements in 40 CFR 98.256(h) as proposed in order to clarify the reporting requirements for on-site and off-site units.

As proposed, we are clarifying 40 CFR 98.253(j) regarding when Equation Y–19 must be used for calculation of CH₄ and CO₂ emissions. The change clarifies that Equation Y–19 must be used to calculate CH₄ emissions if the reporter elected to use the method in 40 CFR 98.253(i)(1), and may be used to calculate CO₂ and/or CH₄ emissions, as applicable, if the reporter elects this method as an alternative to the methods in paragraphs (f), (h), or (k) of 40 CFR 98.253. We are also clarifying reporting requirements to 40 CFR 98.256(j) and (k) as proposed to specify that when Equation Y–19 is used for asphalt blowing operations or

delayed coking units, the facility must report the relevant information required under 40 CFR 98.256(l)(5) rather than all of the reporting elements in 40 CFR 98.256(l).

2. Summary of Comments and Responses

See the comment response document in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart Y. The EPA did not receive any significant comments on this subpart and there are no changes from proposal to the final rule based on these comments.

M. Subpart Z—Phosphoric Acid Production

1. Summary of Final Amendments

The EPA is finalizing the amendments to subpart Z (Phosphoric Acid Production) as proposed. The more substantive corrections, clarifying, and other amendments to subpart Z of Part 98 are discussed in this section. Additional minor corrections are discussed in the Table of 2013 Revisions (see Docket Id. No. EPA-HQ-OAR-2012-0934). We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed. The EPA received one comment requesting clarification on the proposed changes to subpart Z. See the comment response document in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart Z.

We are amending 40 CFR 98.263(b)(1)(ii) and the description of “CO_{2ni}” as proposed to indicate that the sampling method provides CO₂ content, and not emissions. We are also revising 40 CFR 98.266(b) as proposed to require that the annual report must include the annual phosphoric acid production capacity (tons), rather than the annual permitted phosphoric acid production capacity. Finally, we are amending 40 CFR 98.266 as proposed to add a requirement to report the number of times missing data procedures were used to estimate the CO₂ content of the phosphate rock.

2. Summary of Comments and Responses

See the comment response document in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart Z. The EPA did not receive any significant comments for this subpart, therefore, there are no changes from proposal to the final rule based on these comments.

N. Subpart AA—Pulp and Paper Manufacturing

1. Summary of Final Amendments

The EPA is finalizing the corrections and clarifications to subpart AA as proposed and is removing the subpart AA requirement to report paper production in response to public comments. The more substantive corrections, clarifying, and other amendments to subpart AA of Part 98 are discussed in this section. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions.

As proposed, we are amending 40 CFR 98.276(k) to clarify the EPA’s intent regarding the annual pulp and/or paper production information that must be reported. In the final amendments, we are eliminating the requirement to report paper production and further clarifying that the pulp production total to be reported under subpart AA includes only virgin chemical pulp produced onsite.

We are revising Tables AA–1 and AA–2 as proposed to include the CH₄ and N₂O emission factors for each individual fuel and adding kraft lime kiln N₂O factors.

We are also revising Table AA–2 to (1) Amend the title to remove the reference to fossil fuel since the table also includes a biomass fuel (i.e., biogas); (2) specify that the emission factors for residual and distillate oil apply for any type of residual (no. 5 or 6) or distillate (no. 1, 2 or 4) fuel oil; and (3) add a row to specify that the Table C–2 emission factor for CH₄ and the Table C–2 emission factors for CH₄ and N₂O may be used, respectively, for lime kilns and calciners combusting fuels (e.g., propane, used oil, and lubricants) that are not listed in Table AA–2.

The EPA received one comment suggesting a revision to subpart AA that is beyond the scope of this rulemaking. Specifically, the commenter requested revisions to the missing data reporting requirements for spent liquor solids in 40 CFR 98.275. Although we are not including the suggested revisions in this final rule, the EPA is considering these comments for inclusion in a future rulemaking. See the comment response document for subpart AA in Docket Id. No. EPA-HQ-OAR-2012-0934 for additional information.

2. Summary of Comments and Responses

This section summarizes the significant comments and responses related to the proposed amendments to subpart AA. See the comment response document for subpart AA in Docket Id.

No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart AA.

Comment: A commenter requested clarification regarding inclusion of non-chemical pulp (e.g., mechanical pulp) in the pulp production total to be reported. The commenter also requested that paper production be eliminated from the subpart AA reporting requirements because paper production does not relate to GHG emissions generated in the pulp mill and reported under subpart AA.

Response: In the final amendments we are clarifying that the pulp production total to be reported is the total air-dried, unbleached virgin chemical pulp produced onsite during the reporting year and that mechanical pulp does not need to be included in the total. Greenhouse gas emissions reported under subpart AA depend on the amount of pulp produced using chemical (e.g., kraft, soda, sulfite, and semichemical) pulping processes. Emissions associated with onsite energy generation for mechanical pulping are reported under subpart C of Part 98 (Stationary Combustion). Reporting the total annual production of air-dried unbleached virgin chemical pulp provides a common pulp reporting basis regardless of production processes (e.g., bleaching, secondary fiber pulping, and paper making) that happen downstream of the virgin chemical pulping process where the subpart AA GHG emissions are generated.

Mills with positive subpart AA emissions should always report a positive virgin chemical pulp production value. In the final amendments we removed the proposed requirement to report a positive (non-zero) value for pulp production because some mills may wish to report zero pulp production in conjunction with zero subpart AA emissions in years when they do not produce any virgin chemical pulp.

We also examined the correlation between paper production and subpart AA emissions and agree that additional information would need to be collected for GHG emissions to be meaningfully normalized based on paper production. The tonnage of paper produced does not necessarily relate to the subpart AA GHG emissions generated in the chemical pulp mill. Paper is often produced using combinations of chemical pulp, non-chemical pulp, and secondary (recycled) fiber that may be either purchased or produced onsite, along with clay fillers, on-machine coatings, and other additives that contribute to the metric tons of paper produced. Bleaching processes that

occur between the pulp and paper production areas of integrated pulp mills result in a slight loss of virgin pulp tonnage, further reducing the correlation between chemical pulp mill emissions reported under subpart AA and paper production. Furthermore, the paper production data reported under subpart AA provides an incomplete picture of GHG emissions normalized per metric ton of paper produced because reporting of paper production is not required under Part 98 for mills that do not report under subpart AA, such as mechanical pulp mills and mills that manufacture paper from purchased pulp (e.g., paper-only mills that report under subpart C). For these reasons, we have eliminated reporting of paper production from subpart AA in the final amendments. The EPA may consider at a later date whether it is necessary to propose new reporting requirements under Part 98 that would allow for a refined normalization of GHG emissions per ton of paper produced for all types of pulp and paper mills.

O. Subpart BB—Silicon Carbide Production

We are finalizing several revisions to subpart BB of Part 98 (Silicon Carbide Production) as proposed. The more substantive corrections, clarifying, and other amendments to subpart BB of Part 98 are discussed in this section. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed.

We are revising 40 CFR 98.282(a) to remove the requirement for silicon carbide production facilities to report CH₄ emissions from silicon carbide process units or furnaces. We are removing 40 CFR 98.283(d) to remove the CH₄ calculation methodology. As discussed in the preamble to the proposed amendments (78 FR 19802, April 2, 2013), the EPA has determined that the requirement to report CH₄ emissions is not necessary to understand the emissions profile of the industry.

Reporters must continue to monitor and report CO₂ emissions from silicon carbide process units and production furnaces. We are revising 40 CFR 98.283 so that CO₂ emissions are to be calculated and reported for all process units and furnaces combined. The final rule revises 40 CFR 98.283 for consistency with the reporting requirements of 40 CFR 98.286. These amendments are finalized as proposed. The EPA received no comments on the proposed changes.

P. Subpart DD—Electrical Transmission and Distribution Equipment Use

We are finalizing two substantive corrections to subpart DD (Electrical Transmission and Distribution Equipment Use) as proposed. We are revising 40 CFR 98.304(c)(1) and (c)(2) to correct the accuracy and precision requirements for weighing cylinders from “2 pounds of the scale’s capacity” to “2 pounds of true weight”. The EPA received no comments objecting to the proposed changes.

Q. Subpart FF—Underground Coal Mines

We are finalizing multiple amendments to subpart FF of Part 98 (Underground Coal Mines) as proposed. The final amendments clarify certain provisions and equation terms, harmonize reporting requirements, and improve verification of annual GHG reports. The more substantive corrections, clarifying, and other amendments to subpart FF of Part 98 are discussed in this section. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed.

We are revising the terminology in subpart FF provisions in 40 CFR 98.320(b), 40 CFR 98.322(b) and (d), 40 CFR 98.323(c), 40 CFR 98.324(b) and (c), and 40 CFR 98.326(r) as proposed to adopt terminology that more accurately reflects industry operation. Specifically, for ventilation systems, we have replaced the terminology “wells” with “ventilation system shafts” or “vent holes”, and for degasification systems, we have replaced the terminology “shafts” with “gob gas vent holes”. We have also revised the term “flaring” to clarify that mine ventilation air is destroyed using a ventilation air methane (VAM) oxidizer.

We are revising the reporting requirements of subpart FF as proposed to include additional data elements that will allow the EPA to verify the data submitted, perform a year to year comparison of the data, and assess the reasonableness of the data reported. The additional data elements are included in revised 40 CFR 98.326(h), (i), (j), (o), (r), and new requirement (t) include: The moisture correction factor used in the emissions equations, units of measure for the volumetric flow rates reported, method of determining the gas composition, the start date and close date of each well, shaft, or vent hole, and the number of days the well, shaft, or vent hole was in operation during the reporting year. We are also adding a requirement (40 CFR 98.326(t)) for a reporting mine to provide the

identification number assigned to it by the Mine Safety and Health Administration (MSHA). The reporting requirements have also been updated to harmonize with changes to the calculation methods as itemized in the Table of 2013 Revisions (see Docket Id. No. EPA-HQ-2012-0934). These amendments are finalized as proposed.²⁷

The EPA received no comments to the proposed changes. However, one reporting requirement that was proposed to be added as 40 CFR 98.326(t), the amount of CH₄ routed to each destruction device, was subsequently discovered to be redundant with information already collected under the rule, namely, 40 CFR 98.326(c) quarterly CH₄ destruction at each ventilation and degasification system destruction device or point of offsite transport. Therefore, the proposed requirement is no longer being added. Additionally, the new reporting requirement to provide the identification number assigned by MSHA is now numbered as 40 CFR 98.326(t), instead of 40 CFR 98.326(u) as it was proposed.

R. Subpart HH—Municipal Solid Waste Landfills

1. Summary of Final Amendments

We are finalizing several amendments to 40 CFR Part 98, subpart HH (Municipal Solid Waste Landfills) to clarify equations and amend monitoring requirements to reduce burden for reporters, where appropriate. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA-HQ-OAR-2012-0934). We are finalizing amendments to the definition of the DOC term (degradable organic carbon) for Equation HH-1, as proposed, to indicate that the DOC values for a waste type must be selected from Table HH-1. We are also finalizing amendments, as proposed, to the definition of the term “F” in Equation HH-1 (fraction by volume of CH₄ in the landfill gas) to specify that this term must be corrected to zero percent (0%) oxygen and finalizing amendments to the monitoring requirements at 40 CFR 98.344(e) to specify how to correct this term to zero percent (0%) oxygen.

We are finalizing amendments, as proposed, to change the minimum CH₄ concentration monitoring frequency in recovered landfill gas from weekly to monthly. We are retaining the

requirement, as proposed, to have 14 days between monthly sampling events if only one sample is collected per calendar month.

We are finalizing revisions to the definition of oxidation fraction in Equations HH-5, HH-6, HH-7, and HH-8 of subpart HH to refer to the oxidation fractions in Table HH-4 (although, as discussed below, we are revising Table HH-4 based on comments received). We are finalizing revisions to Equations HH-6, HH-7, and HH-8 to generalize these equations in the event that the landfill contains multiple landfill gas collection system measurement locations and/or multiple destruction devices. While we are finalizing amendments to nearly all of the terms for Equations HH-6, HH-7, and HH-8 as proposed, we are further revising the proposed definition $f_{Dest,n}$ in Equations HH-6 and HH-8 to delete the phrase “. . . is destroyed in a back-up flare (or similar device) or if the gas . . .” Since the revised equations explicitly consider on-site back-up control devices, it is no longer necessary to assume $f_{Dest} = 1$ when a back-up flare is used. We are also finalizing proposed revisions to the reporting requirements associated with $f_{Dest,n}$ in 40 CFR 98.346(i)(5). As proposed, we are finalizing amendments to generalize the reporting requirements for each measurement location. Additionally, based on the revisions to $f_{Dest,n}$ outlined above, we are replacing requirements to report operating hours for the “primary” and “back-up” destruction device and a single value of destruction efficiency with requirements to report the number of destruction devices and the operating hours and destruction efficiency for each device associated with a given measurement location. We are also finalizing amendments to 40 CFR 98.346(i)(6) and 40 CFR 98.346(i)(7) to clarify that methane recovery calculated using Equation HH-4 is to be reported separately for each measurement location.²⁸ We are finalizing amendments as proposed to revise “in reporting years” to “in the reporting year” in the first sentence in 40 CFR 98.345(c). We are also finalizing, as proposed, amendments to move the reporting elements pertaining to the methane correction factor (MCF) from paragraph (d)(1) to paragraph (e).

We are finalizing numerous revisions to the proposed oxidation fractions in Table HH-4. First, we are specifying that the oxidation fractions based on

methane flux are only applicable for the 2013 reporting year and subsequent reporting years and that an oxidation fraction of 0.10 must be used for reporting years prior to 2013. We are also specifying that, for the 2013 reporting year and subsequent reporting years, owners or operators of landfills that do not have a soil cover of at least twenty-four inches in depth for a majority of the landfill area containing waste must use an oxidation fraction of 0.10 and owners or operators of landfills that have a geomembrane cover with less than 12 inches of soil must use an oxidation fraction of 0.0. We are allowing owners or operators of landfills to use the default oxidation fraction of 0.10 (except for geomembrane covers with less than 12 inches of soil) without determining their methane flux rate in lieu of the new oxidation fractions based on methane flux rates. This limits any additional burden associated with determining the methane flux rates to only those owners or operators of landfills that elect to use the new methane flux-dependent oxidation fractions.

While we are finalizing the methane flux-dependent oxidation fraction values as proposed, we are limiting to some extent, considering the public comments received, the landfills that can use these new methane flux-dependent oxidation fractions to those that have cover soils of 24 inches or more over a majority of the landfill area containing waste. Nearly all of the data upon which the new methane flux-dependent oxidation fractions were based were for landfills with soil covers over 30 inches in depth, so it is reasonable to limit the use of the new methane flux-dependent oxidation fractions to landfills with similar soil cover systems.

We are revising the definition of the term G_{CH_4} (modeled methane generation rate) in the footnote to Table HH-4 to indicate that the modeled methane generation rate is determined from Equation HH-1 of subpart HH or Equation TT-1 of subpart TT, as applicable, because Table HH-4 is referenced in subpart TT and owners or operators of industrial waste landfills must use Equation TT-1 rather than Equation HH-1 to determine the modeled methane generation rate.

We are making one revision to subpart HH based on comments received on the expansion of applicability that will occur in the MSW Landfill sector due to the revision of the GWP for methane to the IPCC AR4 value. Specifically, we are providing a very limited exclusion within 40 CFR 98.340 for certain closed landfills that have not previously had to

²⁷ We are finalizing confidentiality determinations for the new and significantly revised data elements in 40 CFR 98.326. See Section V of this preamble for additional information.

²⁸ We are finalizing confidentiality determinations for the revised data elements in 40 CFR 98.346(i)(5), (i)(6), and (i)(7). See Section IV.A of this preamble for additional information.

report under subpart HH, but would newly be required to report starting in reporting year 2014 because the amended methane GWP causes them to exceed the 25,000 metric tons CO_{2e} emissions threshold for the first time. We have added this exclusion to reduce the burden for these closed landfills, who would otherwise be required to estimate historical waste quantities and develop their first annual report. See Section II.R.2 of this preamble for additional information.

Finally, the EPA received one comment on subpart HH on the need to revisit the k-value decay rates used in the first order decay model for wet landfills, although we did not propose to revise these values. Although we are not including the suggested revisions in this final rule, the EPA may consider these comments for inclusion in a future rulemaking. See the comment response document for subpart HH in Docket Id. No. EPA-HQ-OAR-2012-0934 for additional information.

2. Summary of Comments and Responses

This section summarizes the significant comments and responses related to the proposed amendments to subpart HH. See the comment response document for subpart HH in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart HH.

Comment: Several commenters noted that the proposed revised definition of $f_{Dest,n}$ for Equations HH-6 and HH-8 includes a special provision when gas is destroyed in a “back-up flare (or similar device).” The commenters stated that this distinction is an artifact of the original rule and is no longer necessary because the proposed revisions to HH-6 and HH-8 properly account for multiple control devices regardless of the amount of time any given control device operates during the year, or whether it is considered a primary or backup device. Therefore, the commenters recommended deleting the phrase “is destroyed in a back-up flare (or similar device) or if the gas” from the definition of $f_{Dest,n}$.

Response: We agree with the commenters. Because Equations HH-6 and HH-8 have been generalized to directly account for on-site back-up destruction devices, the default of 1 is no longer necessary in the definition of $f_{Dest,n}$ for these devices. The phrase requested to be deleted has been removed from the definition of $f_{Dest,n}$ in today’s final rule. In addition, we found that the reporting requirements in 40 CFR 98.346(i)(5) still had reporting requirements for “back-up” destruction

devices. We proposed to revise this paragraph to require reporting for each measurement location, but considering the public comments and the revised definition for $f_{Dest,n}$ in these final amendments, we also find that the reporting requirements in 40 CFR 98.346(i)(5) for “back-up destruction devices” is confusing and obsolete. Therefore, based on our proposed revisions to Equations HH-6 and HH-8 and our proposed revisions to 40 CFR 98.346(i)(5), considering these public comments, we are finalizing the reporting requirements related to $f_{Dest,n}$ in the today’s final rule as follows: “If destruction occurs at the landfill facility, also report for each measurement location the number of destruction devices associated with that measurement location and the annual operating hours and the destruction efficiency (percent) for each destruction device associated with that measurement location.”

In our review of the reporting requirements corresponding to the revisions to Equations HH-6 and HH-8 in response to these comments, we also found that, when there are multiple methane recovery measurement locations, the methane recovery should be reported for each measurement location. We consider that 40 CFR 98.343(b)(1) and (2) require use of Equation HH-4 separately for each monitoring location (e.g., 40 CFR 98.343(b)(1) requires owners or operators of MSW landfills that have continuous monitoring systems to “. . . use this monitoring system and calculate the quantity of CH₄ recovered for destruction using Equation HH-4 of this section.”). It is also clear that the methane recovery and the fraction of hours the recovery system operated needs to be determined separately for each measurement location as these are separate inputs for Equations HH-6 and HH-8, as amended, when multiple measurement locations are used. For e-GGRT to perform the necessary calculations and to support verification of reported methane generation and emissions, the measurement location-specific recovery values need to be reported. Therefore, based on our review of the reporting requirements corresponding to the revisions to Equations HH-6 and HH-8 in response to these comments, we are also finalizing amendments to 40 CFR 98.346(i)(6) to specify that the annual quantity of recovered CH₄ calculated using Equation HH-4 must be reported for each measurement location and to 40 CFR 98.346(i)(7) to specify that the annual operating hours of the gas

collection system must be reported for each measurement location.

Comment: Several commenters expressed support of the revisions to allow methane concentration measurements to be performed monthly rather than weekly; however, these commenters objected to the inclusion of the 14 day interval between monthly samples (if only one sample is collected per calendar month). The commenters stated that the EPA’s analysis of three years of data provided for 395 landfills showed that there is very little variability in methane concentration across either weekly or monthly measurements. Some of the commenters also stated that qualified personnel properly trained in instrument calibration, sample measurement, and documentation procedures must be used to collect the readings for QA purposes and the 14 day limitation significantly and unnecessarily complicates scheduling of required personnel. Finally, a commenter argued that, for destruction devices that operate only intermittently (a common occurrence), it may not be possible to take a monthly reading at least fourteen days apart due to the operating schedule of the device. For example, if a device only operates for several days at the end of one month and the beginning of the next month, it would be impossible to acquire a reading for each month at least 14 days apart. For these reasons, the commenters suggested that the proposed 14 day interval between monthly samples be deleted from the rule.

Response: As described in the memo “Review of Weekly Landfill Gas Volumetric Flow and Methane Concentration” (dated October 18, 2012 in Docket Id. No. EPA-HQ-OAR-2012-0934), our analysis concluded there was an increase in the uncertainty of the annual methane recovery estimate if the sampling frequency was reduced from weekly to monthly, but that the increase in the uncertainty was acceptable given the significant reduction in sampling and analysis costs. In our analysis, we used monthly data readings that were a minimum of four weeks apart. That is, the monthly analysis assumed the measurement readings were taken at discrete monthly intervals. If no intervening interval is included, one could collect one sample near midnight on the last day of the month and a second sample just after midnight (i.e., the morning on the first day of the month), which would effectively be equivalent to monitoring bi-monthly. Further analysis of the same set of landfill data suggests the deletion of a minimum interval between monthly samples further increases the

uncertainty of the resulting recovery estimates without reducing costs for the landfill owner or operator (See “Uncertainty of Monthly Landfill Gas Methane Concentration Measurements,” June 7, 2013 in Docket Id. No. EPA-HQ-OAR-2012-0934). Thus, while the variability in the methane composition may be limited, it is still somewhat variable and reducing the sampling frequency will increase the uncertainty of the methane recovery values. Without a significant corresponding reduction in burden, this increase in uncertainty cannot be justified.

It is not clear how reducing the monitoring frequency to monthly with a minimum of a 14 day interval would be onerous for scheduling purposes given that the previous requirement was weekly monitoring with a minimum of 3 days between samples (note: the existing rule has a similar minimum 3 day interval between weekly samples). Based on the weekly data provided by the landfill representatives, it appears that most landfills were able to collect weekly measurement data and most recovery systems operated continuously. The weekly data also suggest that there are very few instances (one landfill, for two month interval) where calendar month sampling could be accomplished only during the last week of one month and the first week of this month. Based on the weekly monitoring data, there does not appear to be any issue with collecting monthly samples at least 14 days apart.

We note that, like the previous weekly monitoring requirement, there are missing data procedures for assessing the composition of the landfill gas if no sample could be collected during the calendar month. We do note that there were some landfills that did not operate their collection system for an entire month. In this case, the methane concentration is not a critical parameter since any concentration times zero flow equals zero methane recovery.

Because the fourteen day period between monthly measurements limits the uncertainty of the methane recovery value and with no real increase in the cost of compliance, we are finalizing this requirement as proposed.

Comment: Several commenters supported the proposed provisions to determine oxidation fractions on a site-specific basis based on the methane flux rate. However, a few commenters indicated that the proposed higher oxidation fractions would result in erroneously low methane emissions. While many of the arguments regarding under-predicting methane emissions focused on factors other than the oxidation fraction (i.e., the methane

recovery factors and the decay rate constants, which were not issues opened in the proposed amendments), two commenters noted that oxidation only occurs in landfill covers that are comprised of soil with the necessary depth, porosity, temperature and microbial population to effect oxidation. These commenters noted that landfills with composite or geomembrane covers that do not have a soil cover or a sufficient soil cover will not have any surface oxidation. One commenter indicated that the tests upon which the revised factors are based were conducted primarily on systems with landfill gas collection systems and well-engineered cover systems so the data were not representative of typical landfills.

One commenter noted that, in order to streamline the calculations and to use a consistent basis from year to year, the EPA should allow the reporter an option to continue to use an oxidation factor of 0.1.

Response: We appreciate the support of commenters that agreed with the proposed provisions to determine oxidation fractions on a site-specific basis based on the methane flux rate. We agree that the site-specific oxidation fraction should improve the methane emission estimates for facilities with low methane flux rates and sufficient soil cover to effect oxidation. However, we also agree with the commenters who noted that oxidation must be predicated on the presence of sufficient soil cover. We reviewed the available data upon which the proposed oxidation fractions were based. Nearly all of the recent tests were conducted using distinct location measurement techniques (surface air, chamber or soil probe measurements) and all measurements were made in areas that had a soil cover system of 30 inches or more. While we would have preferred to have more “full-plume” tests, which would better characterize the oxidation fraction over the entire landfill area, the surface and flux chamber measurements are not biased provided the surface locations are randomly selected and a sufficient number of measurements are made. We expect that most landfills will have intermediate or final soil covers over most of the areas of the landfill that contain waste, so these tests are generally applicable to most landfills. However, Table HH-4, as proposed, contained no restrictions on the use of the new methane flux-dependent oxidation fractions so it is conceivable that landfills that predominantly have a daily soil cover could use these oxidation fractions that were developed for landfills with a much deeper cover

soil layer. Therefore, we have revised Table HH-4 to limit the applicability of the new methane flux-dependent oxidation fractions to owners or operators of landfills that have a soil cover of at least 24 inches in depth for a majority of the landfill containing waste. We are also adding a new oxidation fraction for landfills that have a geomembrane cover and less than 12 inches of cover soil. Starting with the 2013 reporting year, these landfills must use an oxidation fraction of zero.

We agree that the oxidation study data are heavily weighted to landfills with gas collection systems, which is why we do not support the average oxidation fractions by soil type presented in the summary table of the SWICS addendum. We note that all but one of the average oxidation fractions by soil type presented in the summary table of the SWICS addendum are greater than the 0.35 oxidation fraction proposed for landfills with “low flux rates” and all of them are higher than the 0.25 oxidation fraction proposed for landfills with “medium flux rates.” By grouping the oxidation data into bins based on the methane flux rate (prior to any oxidation), we avoid the obvious bias in the average oxidation fractions as recommended in the SWICS addendum caused by the preponderance of studies conducted at landfills with gas collection systems. Although there are fewer measurements in the high methane flux range (i.e., greater the 70 grams methane per square meter per day) as compared to number of measurements in the other methane flux bins, there are a sufficient number of test runs in each bin to adequately characterize the average oxidation fraction for each bin. Therefore, we maintain that the oxidation fractions grouped into bins by methane flux rates provides the most accurate and unbiased means of estimating oxidation fractions for landfills based on the available data.

Finally, we agree that for many landfills that do not have gas collection systems, the new oxidation fractions based on methane flux rates is not likely to significantly alter their predicted methane emissions compared to using the general oxidation fraction default of 0.10. Therefore, we also include in Table HH-4 the option for any landfill owner or operator, except those of landfills with geomembrane covers with little cover soil, to simply use the default oxidation fraction of 0.10 without the need to calculate methane flux rates.

Comment: One commenter requested that the EPA clarify in the final rule that the proposed revised oxidation factor

approach for calculating CH₄ emissions be used for reporting years 2013 and forward, and not require facilities to revise emissions data from reporting years 2010–2012. Such retroactive revisions would be time-consuming and expensive while resulting in minimal changes to reported emissions.

Response: As indicated in our response to similar comments on the general reporting requirements in Section III.B of this preamble, these final amendments do not require facility owners or operators to resubmit previous annual reports. In the case of the oxidation factor, this value only impacts the emissions for the current reporting year and subsequent reporting years. Landfill owners or operators will not be required to determine methane fluxes for previous annual reports and revise those reports if a different oxidation factor applies. We have revised Table HH–4 to clarify that an oxidation factor of 0.1 must be used for reports prior to the 2013 reporting year and that the new oxidation factors can only be used starting with the 2013 and later reporting years.

Comment: One commenter noted that an expansion of applicability that will occur in the MSW Landfill sector due to the revision of the GWP for methane that would not occur in certain other sectors (e.g., subpart FF: Underground Coal Mines, subpart NN: Natural Gas) because those sectors' applicability threshold is not based on CO₂e emissions. The commenter described requiring reporting from more very small landfills and requiring other very small closed landfills to continue reporting as costly and of limited policy relevance. The commenter further noted that the applicability determination for MSW Landfills is already based on the methane generation level, which was converted to tons CO₂e so that emissions of CO₂ from stationary combustion sources are not considered in determining applicability under the rule.

Given the increased cost and limited utility of these “side effects” of revising the GWPs, the commenter recommended that the EPA establish both a methane-based reporting threshold for subpart HH to replace the CO₂e based reporting threshold and a methane-based requirement for exiting the program. The commenter stated that changes are easily implemented by simply establishing a methane reporting threshold of 1190 metric tons/year or more and by adding new language to clarify off-ramp provisions for both the five-year exit threshold (1190 metric tons CH₄) and the three-year exit threshold (714 tons metric tons CH₄).

The commenter noted that subpart HH facilities would still calculate and report methane as well as CO₂e emissions for EPA inventory purposes but rule applicability and program exit provisions would be based upon methane emissions, not CO₂e. According to the commenter, the proposed exit provisions do not consider ancillary subpart C anthropogenic emissions because MSW Landfills that meet the exit provisions are very small and primarily closed landfills, and they do not operate subpart C devices. The commenter described subpart C emissions as either non-existent or at such negligible amount that including these emissions would not prevent a subpart HH facility from exiting the program. Therefore, according to the commenter, subpart HH reporters would not exit the program prematurely due to exclusion of subpart C anthropogenic emissions.

According to the commenter, a methane based reporting threshold would allow the Agency to avoid increasing the reporting program burden for the MSW landfill sector and the EPA staff. It would also prevent subjecting additional small and primarily closed landfills with negligible emissions to reporting requirements and new compliance costs. Existing reporters would not be delayed five additional years or more from exiting the reporting program. It also, according to the commenter, would allow the EPA to meet national and global inventory program commitments without needlessly affecting GHG MRR applicability.

Response: As a programmatic issue, we have determined that the 25,000 tons CO₂e reporting threshold is a reasonable reporting threshold. Because MSW landfills are primarily a methane emissions source and the size of the landfill is expected to be correlated with its methane generation, we did establish applicability based on methane generation as calculated using the methods specified in subpart HH. However, the threshold value for reporting has always been the CO₂e of that methane generation at a value of 25,000 metric tons CO₂e, which is consistent with most other subparts in Part 98.

As noted in the preamble to the proposed rule, the revised GWP for methane more accurately reflects the estimated radiative forcing effects of methane emissions. We also noted in the preamble to the proposed rule that revisions to the GWP values would cause a number of facilities to have to newly report under subpart W: Petroleum and Natural Gas Systems,

subpart II: Industrial Wastewater Treatment, and subpart TT: Industrial Waste Landfills, in addition to subpart HH. We specifically estimated the number of new reporters by subpart, the additional costs incurred for all new reporters in each subpart, and the additional emissions reported under the GHGRP for each subpart. Based on the cost estimates provided in the preamble to the proposed rule, the costs per ton of newly reported CO₂e for MSW landfills were among the lowest of any of the subparts projected to have an increase in the number of reporters due to the revisions to GWP values in Table A–1. Therefore, we do not agree that the revision to the GWP for methane unduly burdens owner or operators of MSW landfills in general.

We project most of the new reporters to be open landfills that reach the reporting threshold a year or two earlier than they would otherwise (without the revision in GWP values). We see no need to alter the reporting threshold for these open landfills. Emissions from open landfills generally increase every year, so the change in the GWP of methane may cause them to report one year earlier, but that is a small incremental burden over the facility's expected annual reports over the following years. We see advantages to open landfills reporting into the program earlier based on the revised GWP for both nationwide inventory purposes and policy matters. Therefore, we are not providing a blanket applicability change in terms of methane generation.

We also do not find merit in the argument that the terms of the off-ramp provisions should be changed to methane emissions. Besides neglecting the stationary combustion source CO₂ emissions, which may, as the commenter noted, be small, we find that the “additional years of reporting” do not constitute a significant increase in burden. Landfills on the off-ramp provisions are expected to have no real monitoring requirements under subpart HH since waste is no longer received at the landfill and the gas collection system (if once present) will generally not be operated given the declining methane generation. Consequently, all of the data they would need to determine their subpart HH emissions will already be in the e-GGRT system. The e-GGRT system will automatically carry forward the historical waste disposal records and perform the necessary calculations. The landfill owner or operator will only need to review, verify, and submit the report. While the landfill may have to submit

a few additional annual reports, the additional burden incurred is minimal.

On the other hand, there may be a limited number of small, older, closed landfills that have not previously had to report under subpart HH that would be required to newly report in 2014 by exceeding the 25,000 metric tons CO₂e emissions threshold for the first time solely due to the increase in the GWP of methane. We expect very few small, older, closed landfills would have the specific characteristics to have to newly report solely due to the increase in the GWP of methane; however, for these closed landfills, it would be a substantial additional burden to estimate historical waste quantities and develop their first annual report. As these landfills are closed, they no longer have a source of revenue from waste disposal fees, and the burden of reporting would be greater for them than for reporters with active revenue. Furthermore, these closed landfills will have declining emissions in all future years since they are no longer receiving waste and additional methane is not being produced. The first consequence of these declining emissions is that these reporters would provide data for only a few years until they can exit the program because their emissions are below threshold levels for the required period of time. The second consequence is that it is extremely unlikely that the information collected from these closed landfills would be useful when considering future policy options. The minor incremental improvement to overall emission totals for this sector does not warrant the disproportionate burden that would be imposed on these older, small, closed facilities for information that is not useful for policy purposes. Consequently, we consider it reasonable to provide a very limited exclusion within subpart HH to reduce the burden for these specific older, small, closed landfills. Specifically, we are finalizing an amendment to 40 CFR 98.340 to modify paragraph (a) to specify that the source category does not include MSW landfills that have not received waste on or after January 1, 2013, and that had CH₄ generation, as determined using both Equation HH-5 and Equation HH-7 of this subpart, of less than 1,190 metric tons of CH₄ in the 2013 reporting year, and that were not required to submit an annual report under any requirement of Part 98 in the reporting years prior to 2013.

In conclusion, we maintain that the revised GWP values in Table A-1 of Subpart A more accurately reflect the climate impacts of methane emissions and that the existing applicability threshold for MSW landfills in subpart

A in terms of CO₂e emissions is reasonable. We have adequately considered the impacts of the revisions of the GWP of methane on MSW landfills (as well as other subparts in Part 98) and have concluded that these impacts are reasonable. However, we are providing a specific exclusion for certain small, older, closed MSW landfills that did not previously have to report to eliminate the impacts of the revisions to the GWP of methane for these landfills. Finally, we are not making any revisions to off-ramp provisions for subpart HH as requested by the commenter.

S. Subpart LL—Suppliers of Coal-based Liquid Fuels

We are finalizing multiple revisions to 40 CFR part 98, subpart LL (Suppliers of Coal-based Liquid Fuels). This section includes the more substantive corrections, clarifying, and other amendments to subpart LL. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA-HQ-OAR-2012-0934).

As proposed, we are removing the requirements at 40 CFR 98.386(a)(1), (a)(5), (a)(13), (b)(1), and (c)(1) for each facility, importer, and exporter to report the annual quantity of each product or natural gas liquid on the basis of the measurement method used. The EPA received no comments to the proposed changes.

T. Subpart MM—Suppliers of Petroleum Products

1. Summary of Final Amendments

We are finalizing revisions to 40 CFR part 98, subpart MM (Suppliers of Petroleum Products) as proposed to clarify requirements and amend data reporting requirements to reduce burden for reporters. Based on a comment received, we are also removing the requirement to report a complete list of methods used to measure the annual quantities reported for each product or natural gas liquid. The more substantive corrections, clarifications, and other amendments to subpart MM are found here. Additional minor corrections, including changes to the final rule, are presented in the Table of 2013 Revisions (see Docket Id. No. EPA-HQ-OAR-2012-0934).

We are finalizing the amendments to clarify the equation term for “Product_i” at 40 CFR 98.393(a)(1) and (a)(2) to exclude those products that entered the refinery but are not reported under 40 CFR 98.396(a)(2) as proposed.

We are finalizing as proposed the harmonizing changes to 40 CFR

98.394(b)(3) to make the equipment calibration requirements for petroleum products suppliers consistent with other Part 98 calibration requirements.

We are removing as proposed the requirements of 40 CFR 98.396(a)(1), (a)(5), (a)(13), (b)(1), and (c)(1) for each facility, importer, and exporter to report the annual quantity of each petroleum product or natural gas liquid on the basis of the measurement method used. We are also removing the requirements of 40 CFR 98.396(a)(4), (a)(8), (a)(15), (b)(4), and (c)(4) for each facility, importer, and exporter to report a complete list of methods used to measure the annual quantities reported for each product or natural gas liquid.

We are eliminating as proposed the reporting requirement for individual batches of crude oil feedstocks. The reporting requirements for crude oil at 40 CFR 98.396(a)(20) are changed, as proposed, to require only the annual quantity of crude oil.

We are eliminating the requirement to measure the API gravity and the sulfur content of each batch of crude oil at 40 CFR 98.394(d) as proposed. We are also removing, as proposed, the requirement at 40 CFR 98.394(a)(1) that a standard method by a consensus-based standards organization be used to measure crude oil on site at a refinery, if such a method exists. Other associated changes to the rule to harmonize with this change include removing the definition of “batch” from 40 CFR 98.398, removing the procedures for estimating missing data for determination of API gravity and sulfur content at 40 CFR 98.395(c), and the recordkeeping requirement for crude oil quantities at 40 CFR 98.397(b).

We are including, as proposed, the definitions of natural gas liquids (NGL) and bulk NGLs in the subpart MM definitions at 40 CFR 98.398 to clarify the distinction between NGL and bulk NGL for reporting purposes under subpart MM. We are also clarifying, as proposed, the reporting requirements for bulk NGLs and NGLs. We are modifying, as proposed, the requirement at 40 CFR 98.396(a)(22) to specify that NGLs reported in 40 CFR 98.396(a)(2) should not be reported again in 40 CFR 98.396(a)(22).

We are revising, as proposed, the default density and emission factors in Table MM-1 for propane, propylene, ethane, ethylene, isobutane, isobutylene, butane, and butylene. Please refer to the preamble to the proposed rule (78 FR 19802, April 2, 2013) for additional information regarding the amendments to subpart MM.

2. Summary of Comments and Responses

This section summarizes the significant comments and responses related to the proposed amendments to subpart MM. See the comment response document for subpart MM in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart MM. The majority of comments received on subpart MM supported the proposed revisions. A small number of comments were received requesting additional revisions to the reporting requirements that were not proposed. No comments were received opposing the proposed revisions.

Comment: We received several comments supporting the EPA's proposed revision to eliminate reporting of product volumes by measurement method, but one commenter suggested that the requirement to report a list of methods used to measure the annual product quantities reported should also be eliminated as it is tangential to the GHG emissions data.

Response: While the list of measurement methods would help the EPA assess the appropriateness of the standard methods and industry practices that individual reporters select, to further reduce the burden on reporters, the EPA incorporated the commenter's proposed changes because the EPA agrees that the list is tangential to the GHG emissions data when considered along with the other revisions to subpart MM that are being finalized. The EPA will not require that petroleum product suppliers report the standard method or industry standard practice used to measure product quantities that are reported to the EPA.

U. Subpart NN—Suppliers of Natural Gas and Natural Gas Liquids

1. Summary of Final Amendments

We are finalizing several amendments to 40 CFR part 98, subpart NN (Suppliers of Natural Gas and Natural Gas Liquids) to clarify reporting requirements and improve data quality, where appropriate. Additional minor corrections, including changes to the final rule, are presented in the Table of 2013 Revisions (see Docket Id. No. EPA-HQ-OAR-2012-0934). We are finalizing, as proposed, the amendments to the definition of Local Distribution Companies (LDCs) in 40 CFR 98.400(b) to coincide with the definition of LDCs in 40 CFR 98.230(a)(8) (40 CFR part 98, subpart W) to clarify that for LDCs operating in multiple states, operations in each state are considered a separate LDC. We are also finalizing, as

proposed, the revision to clarify that interstate and intrastate pipelines delivering natural gas directly to major industrial users or to farm taps upstream of the LDC inlet are not included in the definition of an LDC.

We are finalizing, with revisions, the proposal to change the way LDCs report the annual volume of natural gas delivered to each large end-user registering supply equal to or greater than 460,000 thousand standard cubic feet (Mscf) during the calendar year. The EPA had previously proposed changing this requirement so that if an LDC knows that a group of meters serves one particular facility receiving a total of greater than 460,000 Mscf during the year, the LDC would be required to report those deliveries per facility rather than per meter. The EPA received two comments that the proposed amendments did not make it clear how LDCs could ensure compliance, specifically, commenters stated it was unclear how much research an LDC should do in order to back up an assertion that the LDC does not "know" whether a series of meters serves one large facility. The commenters suggested that the EPA modify the proposed text to state that the reporting be done at the facility level only if the LDC "knows based on readily available information that multiple meters serve one end user facility." As a result of this comment, the EPA has finalized language to state that an LDC must report the large end-user in this manner if the LDC "knows based on readily available information in the LDC's possession" that multiple meters serve an individual end-user facility to clarify our intention that new research is not required on the behalf of the LDC to determine which meters serve which facilities. Further, the commenters expressed concern that the terms "customer" and "end user facility" were used inconsistently in the rule and preamble and suggested the term "end user facility" be used throughout to improve clarity. As a result of this comment, the EPA has modified the final rule to consistently refer to such end-users as "large end-users." In 98.404(b)(2)(i), the EPA has defined a large end-user as any facility receiving greater than or equal to 460,000 Mscf of natural gas per year, or, if the LDC does not know the total quantity of gas delivered to the end-user facility based on readily available information in the LDC's possession, any single meter at an end-user facility to which the LDC delivers equal to or greater than 460,000 Mscf per year. The term "large end-user" was added throughout the regulatory text to replace

"end-user", as appropriate, and references to this definition were inserted as appropriate to reduce confusion and increase consistency and clarity.

We are finalizing, as proposed, the revision to replace Equation NN-5 with two Equations, NN-5a and NN-5b, to allow LDCs to more accurately calculate the amount of carbon dioxide associated with the net change in natural gas stored on system and natural gas received by the LDC that bypassed the city gate. The EPA is also finalizing the harmonizing revisions to Equation NN-6 that incorporates the two proposed NN-5 equations.

Additionally, we are finalizing, as proposed, the revision to require natural gas liquids fractionators to report the quantity of o-grade, y-grade, and other types of bulk NGLs received and the quantity of these NGLs not fractionated, but supplied downstream.²⁹

Finally, we are finalizing, as proposed, the changes to the default HHV and emission factors in Table NN-1 and NN-2 for LPGs including propane, ethane, isobutane and butane, as well as the factors for natural gas.

2. Summary of Comments and Responses

This section summarizes the significant comments and responses related to the proposed amendments to subpart NN. See the comment response document for subpart NN in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart NN.

Comment: The EPA received four comment letters regarding the proposed amendments to subpart NN. While most of the comments supported the EPA's amendments, we received two comment letters expressing concern that the proposed amendments to the LDC reporting requirements for natural gas supplied to large end-users (i.e., those meters or facilities receiving more than 460,000 Mscf per year) are confusing and lacked clarity. The commenters noted the phrases "customer meter" and "end-user facility" were used inconsistently throughout the rule. They believe this inconsistency could be confusing to reporters. To improve clarity, the commenters recommended the term "end-user facility" be used throughout the rule. The commenters are also concerned the proposed phrase "if known" in 40 CFR 98.406(b)(7) does not provide sufficient clarity regarding

²⁹ We are finalizing confidentiality determinations for significantly revised data element in 40 CFR 98.406. See Section V of this preamble for additional information.

the level of research required by LDCs to determine which meters supply natural gas to each large end-user facility. They noted that LDCs often send one bill to a company's main office reflecting gas usage for all facilities across a state and in such cases gas usage from one individual facility may not be readily known. The commenter suggested the phrase "if known" be replaced with "if known based on readily available information." One commenter suggested the "end-user" be defined as "a single service address" to avoid confusion with the EIA Form 176 reporting of natural gas supply by end-user categories. Finally, one commenter was concerned about the reporting burden associated with determining total fuel deliveries to facilities with many meters, especially those facilities with many meters that receive only a small quantity of gas (less than 50,000 Mscf). The commenter suggested that only meters which record an annual total of 50,000 Mscf or greater per year be included in the total reported deliveries to a large end-user facility.

Response: In the existing rule, LDCs are required to report natural gas delivered to individual meters that received equal to or more than 460,000 Mscf per calendar year. Under Part 98, the CO₂ quantity reported by LDCs associated with deliveries to large end-user meters (i.e., the value calculated using Equation NN-4) has been collected because the large end-user facilities that receive gas through these meters report GHG emissions from natural gas combustion to the EPA in other subparts of Part 98. With the information collected in Equation NN-4, the EPA has been able to quantify a significant portion of the total CO₂ that is double reported by LDCs and large end-user facilities. This has helped the EPA to estimate the total national CO₂ emissions from natural gas combustion reported under the GHGRP.

As we noted in the preamble to the proposed amendments, this approach did not always address the overlap in CO₂ reported by LDCs in subpart NN and large end-user facilities subject to other subparts of Part 98 (for example subpart C or D). For example, in situations where 460,000 Mscf or more of natural gas is supplied to a single large end-user facility in a calendar year by a series or group of meters, where each individual meter receives less than 460,000 Mscf, the CO₂ associated with this gas was not reported under subpart NN, and the quantity of overlap could not be determined. To improve the quality of the national CO₂ emissions estimate for natural gas combustion, we are finalizing the proposed amendments

requiring LDCs to report the quantity of natural gas delivered to each facility known by the LDC to receive equal to or greater than the 460,000 Mscf per year, with some clarifications. The EPA is not requiring LDCs undertake any new research to determine which meters supply gas to each large end-user facility. Rather LDCs should use the information already available to them in their existing records (e.g., meter addresses or billing records). If an LDC has insufficient information to make the determination, they may continue to report data for each gas meter that receives equal to or greater than 460,000 Mscf per year. To clarify our intention, we agreed with the commenter and have amended 40 CFR 98.403(b)(2)(i) to define the term "large end-user" as either any large end-user facility receiving greater than or equal to 460,000 Mscf of natural gas per year or a single meter receiving equal to or greater than 460,000 Mscf per year when the LDC does not know the total quantity of gas delivered to the facility, based on readily available information in the LDC's possession. We revised 40 CFR 98.404 and 40 CFR 98.406 to make those sections consistent with the changes made in 40 CFR 98.403(b)(2).

The EPA considered using the term "single service address" to refer to facilities that receive equal to or greater than 460,000 Mscf per year as suggested by one commenter as a means of reducing potential confusion between natural gas supply data reported under 40 CFR 98.406(b)(7) for individual large end-users (either a facility or meter) and natural gas reported under 40 CFR 98.403(b)(13) for the EIA end-use categories. However, we decided not to make this change since the new definition added to 40 CFR 98.403(b)(2)(i) should reduce the likelihood that reporters will confuse the two reporting requirements. Also, the term "facility" is already defined in Part 98 and used consistently throughout the rule. We were concerned that introducing a new term to refer to a facility could result in greater confusion as the suggested change would make subpart NN inconsistent with other subparts of the rule.

The EPA disagrees with the commenter's recommendation that LDCs be required to report only meters with fuel usage of 50,000 Mscf or greater for large end-user facilities that exceed the reporting threshold in aggregate and have multiple meters. We disagree with this recommendation for several reasons. First, the approach suggested by the commenter would compromise the quality and usefulness of the data collected. The EPA's intention in

collecting these data is to quantify the overlap in reported CO₂ between subpart NN and other subparts in estimating total U.S. CO₂ emissions from natural gas combustion. Under the subparts applicable to large end-user facilities, direct emitters report emissions for all combustion units and processes located at their facility, regardless of the quantity of emissions from the unit or process. Therefore, if LDCs did not report the CO₂ quantity associated with gas delivered through small meters, the overlap could not be properly determined. While the impact on the CO₂ quantity for an individual facility would be small, the impact on the quality of national CO₂ estimates would be more significant and would be difficult to quantify. Since Part 98 requires direct emitters to report all emissions from combustion sources, allowing LDCs to report natural gas supplied to some but not all meters located at large end-user facilities would result in an overestimate of national CO₂ emissions from natural gas combustion. It is EPA's intention to quantify national CO₂ emissions from natural gas combustion as accurately as possible.

Second, under the suggested approach, the reporter would be required to determine the quantity of natural gas flowing through each of these meters to assess whether it exceeds the 50,000 Mscf threshold, which means the quantity of gas flowing through each meter would still need to be determined under the commenter's proposed approach as it is under the final rule. The methodology used to calculate the CO₂ quantity associated with this gas is simple, once the quantity of fuel has been determined (fuel quantity times an emission factor and heating rate, which may be default factors). Therefore, the EPA has determined that there is not a significant burden associated with calculating and reporting this CO₂ quantity.

Finally, the suggested approach to require that only gas delivered through a meter with a fuel usage of 50,000 Mscf per year or greater be reported would result in additional reporting burden for many LDCs. This is the case, for example, when the total quantity of gas delivered to a customer is known based on billing records or other information. Requiring LDCs to evaluate, and subtract out, the usage for each individual meter that supplies a single large end-user facility with less than 50,000 Mscf per year could be time consuming. This evaluation would need to be completed for each reporting year, since the gas delivered through a particular meter may be above the threshold one year and below the

threshold the next year. We anticipate that the process of evaluating and subtracting out the gas supplied to smaller meters, as recommended by the commenter, would require considerable additional work for LDCs.

V. Subpart PP—Suppliers of Carbon Dioxide

We are finalizing three substantive amendments to subpart PP of Part 98 (Suppliers of Carbon Dioxide) as proposed. One additional minor correction, discussed in the Table of Revisions (see Docket Id. No. EPA–HQ–OAR–2012–0934), is finalized as proposed.

We are amending 40 CFR 98.423(a)(3)(i) as proposed to clarify that facilities with CO₂ production wells that extract or produce a CO₂ stream may use Equation PP–3a to aggregate the total annual mass of CO₂ from multiple extracted streams. This clarifying change increases the reporting flexibility for facilities with CO₂ production wells by allowing them to aggregate CO₂ emissions from multiple CO₂ streams.

We are also amending the reporting requirements of 40 CFR 98.426(f)(10) and (f)(11) as proposed, which require reporting the aggregated annual CO₂ quantities transferred to enhanced oil and natural gas recovery or geologic sequestration. The final rule amendments clarify that these end use application options reflect injection of CO₂ to geologic sequestration or enhanced oil recovery as covered by 40 CFR part 98, subparts RR and UU, respectively. The EPA received no comments on the proposed changes.

W. Subpart QQ—Importers and Exporters of Fluorinated Greenhouse Gases Contained in Pre-Charged Equipment or Closed-Cell Foams

1. Summary of Final Amendments

The EPA is finalizing multiple revisions to subpart QQ (Importers and Exporters of Fluorinated Greenhouse Gases Contained in Pre-Charged Equipment or Closed-Cell Foams) as proposed. The more substantive corrections, clarifying, and other amendments to subpart QQ are discussed in this section. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA–HQ–OAR–2012–0934).

We are correcting the equation term “S_i” in Equations QQ–1 and QQ–2 as proposed to clarify that the input may be mass (charge per piece of equipment) or density (charge per cubic foot of foam, kg per cubic foot). We are

amending an example within the definition of “closed-cell foam” at 40 CFR 98.438 as proposed. We are replacing the term “appliance” with the term “equipment” at 40 CFR 98.436(a)(3), (a)(4), (a)(6)(ii), (a)(6)(iii), (b)(3), (b)(4), (b)(6)(ii), and (b)(6)(iii). We are revising the reporting requirements for 40 CFR 98.436(a)(6)(iii) and (b)(6)(iii) as proposed to match the reported data element to the units required to be reported. The revision is a change from “mass in CO₂e” to “density in CO₂e.” We are amending the definition of “pre-charged electrical equipment component” at 40 CFR 98.438 as proposed.

Finally, we are removing the following reporting requirements to alleviate burden on reporters as proposed: 40 CFR 98.436(a)(5), (a)(6)(iv), (b)(5), and (b)(6)(iv). Please refer to the preamble to the proposed rule (78 FR 19802, April 2, 2013) for additional information regarding the amendments. The EPA received no comments opposing the proposed changes to subpart QQ.

2. Summary of Comments and Responses

See the comment response document in Docket Id. No. EPA–HQ–OAR–2012–0934 for a complete listing of all comments and responses related to subpart QQ. The EPA did not receive any significant comments on the proposed changes and there are no changes to the rule based on these comments.

X. Subpart RR—Geologic Sequestration of Carbon Dioxide

We are finalizing corrections to subpart RR of Part 98 (Geologic Sequestration of Carbon dioxide). The more substantive corrections, clarifying, and other amendments to subpart RR are discussed in this section. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA–HQ–OAR–2012–0934).

As proposed, we are adding a requirement for facilities to report the standard or method used to calculate the mass or volume of contents in containers that is redelivered to another facility without being injected into the well.³⁰ The EPA received no comments on the proposed changes.

³⁰The EPA is also finalizing a data category and confidentiality determination for this data element. See the Confidentiality Determinations Memorandum, “Final data category assignments and confidentiality determinations for (Docket Id. No. EPA–HQ–OAR–2012–0934).

Y. Subpart SS—Electrical Equipment Manufacture or Refurbishment

We are finalizing clarifying amendments and other corrections to subpart SS of Part 98 (Electrical Equipment Manufacture or Refurbishment). The more substantive corrections, clarifying, and other amendments to subpart SS are discussed in this section. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA–HQ–OAR–2012–0934).

We are harmonizing 40 CFR 98.453(d) and 40 CFR 98.453(h) as proposed to clarify the options available to estimate the mass of SF₆ and PFCs disbursed to customers in new equipment. The final rule corrects inconsistencies between paragraphs so that all options are clearly identified as available.

We are adding text to 40 CFR 98.453(d) to include the options to use the nameplate capacity of the equipment by itself and to use the nameplate capacity along with a calculation of the partial shipping charge. We are also revising 40 CFR 98.453(h) to clarify that these calculation requirements only apply where reporters choose to estimate the mass of SF₆ or PFCs disbursed to customers in new equipment using the nameplate capacity of the equipment, either by itself or together with a calculation of the partial shipping charge. These amendments are finalized as proposed. The EPA received no comments on the proposed changes.

Z. Subpart TT—Industrial Waste Landfills

1. Summary of Final Amendments

We are finalizing several amendments to 40 CFR part 98, subpart TT to clarify and correct calculation methods, provide additional flexibility for certain monitoring requirements, and clarify reporting requirements. We are finalizing, as proposed, the minor corrections discussed in the Table of 2013 Revisions (see Docket Id. No. EPA–HQ–OAR–2012–0934). We are finalizing amendments, as proposed, to revise the definition of the term “DOC_F” in Equation TT–1 when a 60-day anaerobic biodegradation test is used as well as revisions to Equation TT–7, which is used to determine a waste stream-specific DOC value when a facility performs a 60-day anaerobic biodegradation test.

We are finalizing revisions to 40 CFR 98.464(b) and (c) to broaden the provisions to determine volatile solids concentration for historically managed waste streams. The revisions to 40 CFR

98.464(b) are being finalized as proposed. The revisions to 40 CFR 98.464(c) are being finalized as proposed except that we are deleting the proposed phrase “but was not received during the first reporting year” to broaden the applicability of these provisions in consideration of the public comments received.

We are finalizing amendments to 40 CFR 98.466(b)(1), as proposed, to clarify that waste quantities for inert waste streams must be reported. We are also finalizing amendments to the reporting requirements specific to Equations TT-4a and TT-4b in 40 CFR 98.466(c)(4), as proposed.³¹

We are finalizing amendments, as proposed, to revise the oxidation fraction default value (“OX”) in Equation TT-6 to reference the default values in Table HH-4; however, there are a number of revisions to Table HH-4 from the proposed table upon consideration of the public comments received. These revisions include limiting the new oxidation factors to landfills with soil covers of at least 24 inches for a majority of the landfill area containing waste, allowing the continued use of the 0.10 default oxidation factor, and clarifying that the modeled methane generation term for facilities subject to subpart TT is the result from Equation TT-1, not Equation HH-1. Please see Section II.R of this preamble for more details regarding these revisions.

We are finalizing amendments, as proposed to Table TT-1 of subpart TT of Part 98 to include an “industrial sludge category” and to clarify certain industry default DOC values were applicable to wastes “other than industrial sludge.” Based on public comments received, we are adding a definition of “industrial sludge” to 40 CFR 98.468 to clarify what waste streams are included in this waste category.

2. Summary of Comments and Responses

Several comments were received from industrial waste landfill owners or operators regarding the proposed oxidation fractions assigned by methane flux rates in Table HH-3. These comments and responses are included in Section II.R. of this preamble. The significant comments and responses related to other proposed amendments to subpart TT are summarized in this section. See the comment response

document in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to subpart TT.

Comment: A commenter noted that the original subpart TT regulations allowed facilities to develop a DOC for use when estimating emissions from historic waste deposits. According to the commenter, it appeared that once such a DOC was developed, the same DOC was required to be used for these historic deposits in all future reports under the Greenhouse Gas Reporting Rule, even if better information became available. The commenter pointed to 40 CFR 98.463(a)(3), particularly the passage: “The historical values for DOC or DOCx must be developed only for the first annual report required for the industrial waste landfill; and used for all subsequent annual reports (e.g., if DOC for year x = 1990 was determined to be 0.15 in the first reporting year, you must use 0.15 for the 1990 DOC value for all subsequent annual reports).” The commenter stated that this was not reasonable since facilities had relatively little time to develop such historical DOCs, following the EPA’s protocol, for the first required reporting of landfill methane emissions under a new reporting scheme and procedures. Making those initial determinations unchangeable, the commenter noted, would not make sense when the EPA is revising DOCs applicable to various wastes landfilled in the forest products industry.

The commenter further asserted that this interpretation that the historical DOC that the facility first chose is fixed for all time appears to be at odds with 40 CFR 98.3(h), which requires a facility to submit a revised report if the facility becomes aware of a substantive error in the prior report—which presumably could include an error in the DOC applied to historical deposits in the landfill. The commenter pointed to a response to a question from the EPA e-GGRT Help Desk, which indicated that a facility could recalculate and resubmit an annual GHG report if it determined that there is a more accurate method for estimating emissions, which could include a more accurate DOC than what was used in the past.

Response: The requirements in 40 CFR 98.463(a) to determine the historical waste quantities and DOC values for the first annual report and to use those values for all subsequent annual reports is based on the need to have a single, consistent waste disposal timeline across annual reports. The requirement was also intended to make it clear that owners or operators of landfills did not have to recalculate an

average DOC value determined according to the provisions in 40 CFR 98.463(a)(3)(iv) if additional measurements are made for subsequent reporting years. The EPA did not intend, however, to prevent landfill owners and operators from correcting known errors or inaccuracies in the historical waste disposal quantities or DOC values. For example, if DOC values are determined using the anaerobic degradation method for the first time in the 2013 reporting year and that determination indicates that the historical DOC values used are in error, we do not interpret the language in 40 CFR 98.463(a)(3) to prevent correction of these historical DOC values. We note that the language in 40 CFR 98.463(a)(2) and (3) specifically uses the phrase “for the first annual report” and does not require that the measurements be made in the “first reporting year.” That is, we interpret the language used in 40 CFR 98.463(a)(2) and (3) to require a consistent historical time series for waste quantities and DOC values be used in all annual reports. Revisions to the historical waste quantities and DOC values are permissible, but the entire time series of annual reports must be revised and resubmitted so that they are consistent with the revised “first annual report.”

However, we do not agree that the proposed language in 40 CFR 98.464(c) effectively limits the applicability of the methods to determine historical DOC values to waste streams that were not received “during the first reporting year.” Although this provision was specifically added to address comments that some waste streams that were historically managed in the landfill were not generated during the first reporting year, it is unnecessary to limit the use of these methods to only waste streams that were not received in the first reporting year. Specifically, we acknowledge that the anaerobic test method was not included in subpart TT until late 2011, so that this method could not be used to establish waste stream-specific DOC values for the first annual report. We did not intend to limit the use of the anaerobic test method to only those streams that were not received during the first reporting year. Therefore, we are revising the proposed language at 40 CFR 98.464(c) to delete the phrase “but was not received during the first reporting year” to remove this restriction. Therefore, facilities can use test data from more recent years to revise the historical waste records provided that all annual reports are revised to use the same historical waste records. However, we also clarify, per our original intent, that

³¹ We are finalizing confidentiality determinations for the significantly revised data elements in 40 CFR 98.466. See Section V of this preamble for additional information.

it is not necessary to revise these historical DOC values (and all historical annual reports) each year new DOC measurements are made. Thus, the owner or operator can choose to use "current reporting year" DOC measurement values only for the current reporting year. Alternatively, the owner or operator can use the new information to revise the historical waste values, but then they must revise and resubmit all previous annual reports so that the historical waste records for all annual reports are consistent with the records used in the "first annual report."

Comment: A commenter noted that they have several waste streams that have DOC values more similar to the new default for industrial sludge than the defaults for waste streams "(other than sludge)." The commenter stated that the approach to DOCs that EPA has proposed would therefore continue to overstate substantially the GHG emissions from industrial waste landfills. The commenter suggested that the EPA either add more detailed DOC waste stream defaults to Table TT-1 or clarify that the term "industrial sludge" (which is undefined in the proposed rule) is intended to encompass materials that meet the common, dictionary meaning of "sludge" (e.g., "thick, soft, wet mud or a similar viscous mixture of liquid and solid components, especially the product of an industrial or refining process"), as well as the meaning the EPA often gives to "sludge," i.e. residue removed from wastewater treatment or air pollution control equipment. This would then allow industrial waste landfill owners or operators to apply the "industrial sludge" DOC to a wider array of waste streams.

Response: With respect to adding more detailed waste stream-specific DOC defaults to Table TT-1, we note that industrial waste landfill owners and operators may elect to determine a waste stream specific DOC value specific for their operations. We included in subpart TT a series of simple and inexpensive tests by which landfill owners and operators may elect to develop more accurate DOC values, as well as a more detailed anaerobic degradation tests if even more accurate values are desired. Landfill owners or operators that have a significant quantity of waste that is not well-characterized by the Table TT-1 defaults may elect to determine their own waste stream-specific DOC value to use in their emission calculations. As noted in our previous response, if these site-specific values are determined for the first time in the 2013 reporting year, the landfill owner or operator can elect to (but is not required to) revise their

historical DOC values and resubmit all previous annual reports based on the revised historical DOC values.

The EPA is willing to consider expanding the list of default DOC values in Table TT-1 to include additional waste streams that are commonly found at industrial landfills. We are willing to work with the commenter and other stakeholders to gather further information to support the change requested and examine whether it should be included in a future rulemaking. However, the information provided by the commenter is new, contains only limited data, and was not part of the original proposal. Additional DOC test data for these waste streams from a larger and more representative sample of facilities would greatly inform such a decision.

With respect to the lack of a definition of "industrial sludge," we agree that clarity is needed. This category was specifically added to address concerns regarding inconsistencies with the DOC values for industrial waste in the 2006 IPCC Guidelines. The 2006 IPCC Guidelines appears to refer to "sludge" in reference to wastewater treatment sludges. As the "industrial sludge" waste category was specifically added to provide consistency with the 2006 IPCC Guidelines, we are adding a definition of "industrial sludge" to clarify that this term specifically refers to sludges collected in wastewater treatment systems or sludges from "wet" air control systems (e.g., wet scrubbers). Specifically, "*Industrial sludge* means the residual, semi-solid material left from industrial wastewater treatment processes or wet air pollution control devices (e.g., wet scrubbers). *Industrial sludge* includes underflow material collected in primary or secondary clarifiers, settling basins, or precipitation tanks as well as dredged materials from wastewater tanks or impoundments. *Industrial sludge* also includes the semi-solid material remaining after these materials are dewatered via a belt press, centrifuge, or similar dewatering process." The EPA believes that the definition suggested by the commenter is overly broad and could encompass materials not intended to be covered. As stated above, the EPA is willing to work with stakeholders to gather and analyze information needed to further refine the list of default DOC values in Table TT-1.

AA. Subpart UU—Injection of Carbon Dioxide

We are finalizing amendments to 40 CFR part 98, subpart UU (Injection of Carbon Dioxide). The more substantive corrections, clarifying, and other

amendments to subpart UU are discussed in this section. We are finalizing all of the minor corrections presented in the Table of 2013 Revisions as proposed (see Docket Id. No. EPA-HQ-OAR-2012-0934).

The EPA is adding a requirement to subpart UU for a facility to report the purpose of CO₂ injection (i.e., Research and Development (R&D) project exemption from subpart RR, enhanced oil or gas recovery, acid gas disposal, or some other reason).³² We are adding a requirement for facilities to report the standard or method used to calculate the parameters for CO₂ received in containers.³³ These amendments are finalized as proposed. The EPA received no comments on the proposed changes.

BB. Other Technical Corrections

1. Summary of Final Amendments

The EPA is finalizing minor corrections to subparts E, G, S, V, and II of Part 98 as proposed. The changes to these subparts are provided in the Table of Revisions for this rulemaking, available in Docket Id. No. EPA-HQ-OAR-2012-0934, and include clarifying requirements to better reflect the EPA's intent, corrections to calculation terms or cross-references that do not revise the output of calculations, harmonizing changes within a subpart (such as changes to terminology), simple typo or error corrections, and removal of redundant text.

2. Summary of Comments and Responses

This section summarizes the significant comments and responses related to minor corrections to subparts E, G, S, V, and II. The EPA received one comment related to subpart G. See the comment response document in Docket Id. No. EPA-HQ-OAR-2012-0934.

Comment: One commenter asked that the EPA revise subpart G to require the reporting of CO₂ emitted directly to the atmosphere from the synthetic ammonia production process.

The commenter noted that the CO₂ captured during ammonia production and used to produce urea "does not contribute to the CO₂ emission estimates for ammonia production." The commenter reasoned that reporting the CO₂ which is bound in urea, as required under subpart G, is inconsistent with other source categories covered by the rule, and is contrary to EPA's

³² The EPA is also finalizing category assignments and confidentiality determinations for new and revised data elements in the Confidentiality Determinations Memorandum (Docket Id. No. EPA-HQ-OAR-2012-0934).

³³ *Id.*

methodology used in the Inventory. The commenter also noted that the structure of subpart G is similar to the structure of subpart P, but should be revised to be similar to the structure of subpart X. The commenter argued that sources in subpart G should be allowed to “reduce their CO₂ reporting for CO₂ in urea” in the same way that sources in subpart X are allowed to “reduce their carbon reporting for carbon in products.”

Response: The EPA acknowledges the commenter’s suggested revisions to the language in subpart G to require reporting only CO₂ that is emitted directly to the atmosphere from ammonia manufacturing rather than reporting CO₂ that is bound in the urea that is produced from ammonia at some facilities. However, the comment falls outside of the scope of this rulemaking. The EPA had proposed clarifications to 40 CFR 98.76(b)(13) of subpart G but had not proposed any revisions to the calculation and monitoring methods described in the rule. Therefore, the EPA is not proposing any revisions in response to this comment at this time.

However, the commenter has raised a consistency issue within Part 98, that subpart G facilities currently are required to report CO₂ that is bound in urea rather than emitted directly to the atmosphere, that merits evaluation and requires further analysis by the EPA. Prior to any modification of the rule language, the EPA will comprehensively assess the implications of such a change to the rule and propose any such revisions for public comment. This will ensure that the EPA is not introducing new or additional issues for facilities reporting under subpart G and other similar subparts, especially in the treatment of emissions that are collected onsite for other uses.

CC. Subpart I Correction

Following signature of the final rule titled, “Greenhouse Gas Reporting Program: Final Amendments and Confidentiality Determinations for Electronics Manufacturing” [78 FR 68162] (“final subpart I rule”), the EPA identified an inconsistency between the preamble and final rule text. In the preamble, we stated that we were finalizing the requirements for the triennial technology report in section 98.96(y) as proposed, which was our intention. However, a sentence was inadvertently added to 98.96(y)(3)(i) in the final subpart I rule. In today’s final rule, we are correcting this error to finalize 98.96(y)(3)(i) as proposed in “Greenhouse Gas Reporting Program: Proposed Amendments and Confidentiality Determinations for Subpart I” [77 FR 63538].

III. Schedule for the Final Amendments and Republication of Emission Estimates for Prior Year Reports

A. Schedule for Final Amendments and Significant Comments

1. Summary of Final Amendments

This section describes when the final amendments become effective for existing reporters and new facilities that are required to report as a result of the amendments to Table A–1. This section also discusses final amendments to subpart A for the use of best available monitoring methods (BAMM) by new reporters and the EPA’s intentions for republishing emissions estimates for the 2010, 2011, and 2012 reporting years that reflect the changes in GWPs, based on the annual reports previously submitted by existing reporters.

Existing Reporters. The final rule requires that existing GHGRP reporters begin using the updated GWPs in Table A–1 for their reporting year 2013 annual reports, which must be submitted by March 31, 2014, as proposed. We have determined that it is feasible for existing reporters to implement the final rule changes for the 2013 reporting year because these revisions do not require changes to the data collection and calculation methodologies in the existing rule. The EPA does not anticipate that the revised GWPs in Table A–1 will require any existing reporters to report under new subparts. The EPA received no comments identifying such a reporter. Such a reporter, if one exists, is not required to report for any past years under any subparts for which the reporter’s emissions newly exceed a reporting threshold, and may use the BAMM provisions described below.

Reporters subject to any subpart of Part 98 for the first time. We are finalizing the schedule for reporters that become newly subject to any subpart as proposed. The final rule requires reporters who are newly required to report under any subpart of Part 98 as a result of the changes to Table A–1 to begin collecting data on January 1, 2014 for the 2014 reporting year. These reporters are required to submit their first reports, covering the 2014 reporting year, by March 31, 2015. This schedule allows time for reporters to acquire, install, and calibrate any necessary monitoring equipment for the subparts to which they are subject in the 2014 reporting year.

As proposed, we are adding provision 40 CFR 98.3(l) to subpart A to allow reporters who are required to newly report under any subpart solely as a result of the revised GWPs in Table A–

1 to have the option of using BAMM from January 1, 2014 to March 31, 2014 for any parameter that cannot reasonably be measured according to the monitoring and QA/QC requirements of a relevant subpart. We are allowing reporters to use BAMM during the January 1, 2014 to March 31, 2014 time period without submitting a formal request to the EPA. Reporters will also have the opportunity to request an extension for the use of BAMM beyond March 31, 2014; those owners or operators must submit a request to the Administrator by January 31, 2014. The EPA does not anticipate allowing the use of BAMM for reporters subject to any subpart of Part 98 for the first time as a result of Table A–1 changes beyond December 31, 2014. The final schedule will allow five to six months after publication of this final rule to prepare for data collection while automatically being able to use BAMM, which is consistent with prior BAMM schedules. These provisions provide additional flexibility for new reporters and do not supersede existing subpart-specific BAMM requirements (e.g., the ability to request BAMM beyond 2011 for subpart W reporters (*see* 40 CFR 98.1(b))). This additional time for new reporters to comply with the monitoring methods in Part 98 will allow many facilities to install the necessary monitoring equipment during other planned (or unplanned) process unit downtime, thus avoiding process interruptions.

2. Summary of Comments and Responses—Schedule

Comment: One commenter recommended that the effective date for the revised and new GWPs be 12 months after the new values are finalized. The commenter stated that a one-year transition would allow reporters to address compliance issues related to GHG reporting, GHG permitting, and related projects that may arise due to the revised GWPs. The commenter stated that delaying implementation of GWPs for one year is reasonable because the changes will create compliance problems. The commenter asserted that it is not appropriate to apply the revised GWPs to 2013 emissions, given that the rulemaking affects who must report and the gases that must be reported. The commenter suggested that the new GWPs be used starting in reporting year 2014.

Some commenters stated that companies and facilities will have to reprogram their data acquisition, analysis, and reporting systems to incorporate revised emission factors, revised emission estimation methods,

and revised reporting requirements. Commenters suggested that the final rule should defer the reporting deadline for 2013 emissions, suggesting increments of at least three or six months after the final revisions are published in the **Federal Register**. Commenters expressed concern about the time required to implement the final rule changes into existing reporting systems, particularly with respect to making changes to internal reporting systems to align with EPA's final extensible markup language (XML) schema or reporting forms.

Response: Because the revised GWPs finalized in this rule are only for compounds that are already listed in Table A-1, reporters do not have to provide additional information for their reporting year 2013 reports and there is no additional burden associated with calculating CO₂e using the revised GWPs. In this final rule, we are not incorporating GWPs from the additional 26 compounds that we proposed to add to Table A-1 in the proposed 2013 Revisions Rule (see Section I.D. of this preamble). As discussed in the preamble to the 2013 Revisions proposal, the EPA intends to use data from the reporting year 2013 GHGRP reports to supplement the top-down national estimate and develop the 2015 Inventory. Therefore, and because the final GWP changes add no burden to existing reporters, we are requiring existing GHGRP reporters to calculate GHG emissions and supply using the revised GWPs from AR4 beginning with RY 2013 reports, which must be submitted by March 31, 2014. New reporters who are required to report under Part 98 as a result of the changes to Table A-1 are required to begin collecting data on January 1, 2014 and must submit their first annual reports by March 31, 2015. We have included provisions in 40 CFR 98.3(l) to allow new reporters to have the option of using BAMM from January 1, 2014 to March 31, 2014, and to request extended BAMM beyond March 31, 2014, which will allow additional time for facilities to prepare for data collection. For concerns regarding the schedule and how this final rule impacts the Tailoring Rule and permitting programs, see Section II.A.2.b of this preamble.

The EPA disagrees with the commenters' recommendations to extend the reporting deadline to accommodate changes to revised emission factors, revised emission estimation methods, and revised reporting requirements. We expect that the final rule changes for the 2013 reporting year are feasible to implement prior to the March 31, 2014 reporting deadline. These changes are consistent

with the data collection and calculation methodologies in the existing rule, and primarily provide additional clarifications or flexibility regarding existing regulatory requirements and do not add new monitoring requirements. Therefore, they do not substantially affect the information that must be collected. Where calculation equations are modified, the changes clarify equation terms or simplify the calculations and do not require any additional data monitoring. Because reporters are not required to actually submit reporting year 2013 reports until March 31, 2014, reporters will have adequate time to adjust their internal reporting programs to the finalized amendments before the reporting deadline.

We note that many reporters use the e-GGRT Web-forms or spreadsheets developed by the EPA for preparing submitting their annual reports. The changes to the GWP values finalized in this rule will have minimal impact on these reporters since the CO₂e values are automatically calculated for reporters using these reporting forms. While we agree that reporters using the XML format to report emissions will need to make revisions, we anticipate that there is sufficient time to make these changes and submit annual reports by the March 31, 2014 deadline for reporting year 2013 data. The EPA will ensure that the e-GGRT reporting system is modified in a timely manner so as to not shorten the window for data reporting. The EPA acknowledges commenters' concerns regarding the XML reporting schema. The EPA will work to finalize the XML schema as early as possible to allow reporters adequate time to complete and upload their XML reports.

Comment: One commenter recommends that the criteria in proposed 40 CFR 93.3(l)(2)(ii) associated with BAMM requests be revised to take into consideration other considerations, such as safety, that may warrant the use of BAMM. The commenter requests that the EPA provide additional flexibility for use of BAMM under 40 CFR 98.3(l); ensure that BAMM is accessible beyond 2014; ensure that 40 CFR 93.3(l) criteria do not conflict with or supersede other subpart-specific BAMM provisions; and, if BAMM provisions in both subpart A and subpart W apply, clarify and harmonize requirements and schedules under the two subparts, especially for the first and second reporting years for new reporters. The commenter further requested that reporters who must comply with subpart W should have the option to use BAMM from January 1, 2014 to June 30, 2014 without having to request EPA approval.

Response: The BAMM provisions in 40 CFR 98.3(l) of subpart A allow new reporters subject to any subpart under Part 98 who would be required to report as a result of the proposed new or revised GWPs to have the option to use BAMM from January 1, 2014 to March 31, 2014 for any parameter that cannot reasonably be measured according to the monitoring and QA/QC requirements of the relevant subpart. These new reporters are allowed to use BAMM during the January 1, 2014 to March 31, 2014 time period without making a formal request to the EPA. Reporters may also request an extension for the use of BAMM beyond March 31, 2014 by submitting a request to and receiving approval from the Administrator in accordance with the provisions in 40 CFR 98.3(l)(2). We do not anticipate permitting the use of BAMM under the provisions of 40 CFR 98.3(l)(2) beyond December 31, 2014. Under the provisions of 40 CFR 98.3(l)(2), new reporters have more than a year to comply with the monitoring and QA/QC requirements of the applicable subparts. We consider this time period sufficient for facilities subject to the rule for the first time in 2014 to acquire, install, and calibrate monitoring equipment to meet the monitoring and QA/QC requirements of the rule. This time period is the same as was allowed for the initial reporting years.

As noted by the commenter, the EPA promulgated additional subpart-specific BAMM provisions for those subparts with unique or unusual situations that would make compliance with the monitoring and QA/QC procedures in those subparts challenging (e.g., subparts I, L, and W). These subpart-specific provisions allow for additional use of BAMM that is not provided under the General Provisions. Under these existing subpart-specific BAMM provisions, a reporter subject to the subpart may request approval to use BAMM for unique and extreme circumstances, such as safety concerns, technical infeasibility, or inconsistency with other local, State or Federal regulations. For example, pursuant to 40 CFR 98.234(f)(8), a reporter subject to subpart W may use BAMM beyond 2011 if it receives approval from the EPA. The new BAMM provisions in the General Provisions, 40 CFR 98.3(l) do not supersede any of these previously promulgated subpart-specific BAMM requirements (see 40 CFR 98.1(b)). Since the deadline to submit subpart W BAMM requests covered in 40 CFR 98.234(f)(8) for the 2014 reporting year has passed, a facility that becomes newly subject to subpart W of Part 98

will be able to use BMM without making a formal request between January 1, 2014 and March 31, 2014 under the provisions for new reporters in 40 CFR 98.3(l). This reporter may seek approval to use BMM after this period (between April 1, 2014 and December 31, 2014) under 40 CFR 98.3(l) by submitting an extension request no later than 60 days after the effective date of the final rule. However, for the 2015 reporting year and forward, the new reporter should request approval to further continue using BMM under subpart W by following the provisions covered in subpart W, 40 CFR 98.234(f)(8).

We decided not to extend the time period during which BMM may be used without seeking EPA approval despite the commenter's recommendation. Extending the deadline to June 30, 2014 as suggested by the commenter would likely result in some facilities taking longer to comply with the rule than is actually necessary. When facilities use BMM, the quality of the reported emissions is impacted. Our aim in setting a March 31, 2014 deadline for using BMM without prior EPA approval is to balance the EPA's need for high-quality data of known accuracy against the reporter's need for sufficient time to install, test, and calibrate new monitoring equipment. For most Part 98 subparts, reporters should have little problem complying with the monitoring provisions by the March 31, 2014 deadline. By requiring reporters to apply for approval to use BMM beyond March 31, 2014, the EPA will be able to ensure that BMM is used only in those situations and times periods where its use is necessary.

B. Republication of Emissions Estimates for Prior Year Reports and Significant Comments

1. Summary of Republication of Emission Estimates for 2010, 2011, and 2012

In the proposed rule, we presented two options for the revision and republication of the CO₂e estimates from annual reports for reporting years 2010, 2011, and 2012 using the proposed GWP values in Table A-1. Under Option 1, reporters who submitted annual reports for the reporting years 2010, 2011, and 2012 would be required to resubmit their prior year reports using the built-in calculation methods in the EPA's Electronic Greenhouse Gas Reporting Tool (e-GGRT) to convert reported quantities of GHGs to CO₂e. Under Option 2, the EPA would independently recalculate revised CO₂e emissions from the prior year reports for each facility

using the revised GWPs in Table A-1. Under this scenario, each reporter would be able to view the EPA's revision of its emission or supply totals in previously submitted 2010, 2011, and 2012 reports through e-GGRT. The reporter would not be able to comment on or change the revised estimate.

The EPA received several comments on these proposed options. In general, commenters were concerned about the impact of revising totals from prior year reports that had previously been published. Commenters also expressed concern that facilities would be liable for changes to applicability under Part 98 or other EPA programs if the CO₂e totals in their annual reports for 2010 through 2012 were recalculated. Of those commenters that supported Option 2, several recommended that the EPA allow reporters to comment on the revised CO₂e estimates prior to publication. These comments and the EPA's response to these comments are described in detail in Section III.B.2 of this preamble.

After reviewing the comments submitted by stakeholders, the EPA is finalizing Option 2. Due to concerns raised by commenters, we are clarifying in this final rule that we do not intend to revise the annual reports submitted and certified by reporters for reporting years 2010, 2011, and 2012 to reflect the revised GWPs finalized in this rulemaking. Prior year reports, using original GWPs, will remain publicly available. The EPA will also publish a version of the CO₂e emissions and supply estimates for the reporting years 2010, 2011, and 2012 using the revised GWPs in Table A-1. The EPA will clearly label the information as a product of EPA analysis, conducted to reflect a consistent time-series of carbon dioxide equivalent (i.e., emissions from the start of the program using the amended GWPs). Under this approach, the EPA's analysis will supplement, not revise or supersede, the previously published data. This will allow the Agency and public to view and compare trends in GHG data, beginning with the first year of GHGRP reporting, using consistent GWPs and without placing any additional burden on reporters. See Section III.B.2 for additional information on the EPA's revised approach.

2. Summary of Comments and Responses—Republication of Emission Estimates for Prior Year Reports

This section summarizes the significant comments and responses related to EPA's proposal to publish recalculated emissions from 2010, 2011, and 2012 reporting years. See the

comment response document in Docket Id. No. EPA-HQ-OAR-2012-0934 for a complete listing of all comments and responses related to emissions recalculations for prior reporting years.

Comment: Several commenters requested that, if the EPA chooses to proceed with revising the CO₂e emission estimates in annual reports for prior reporting years using the proposed revised GWP values, the EPA should pursue this through Option 2 as described in the proposal preamble (where the EPA would itself calculate the revised CO₂e emissions), rather than mandating that reporters revise their prior reports. Many commenters preferred Option 2 because it would not place added burden on reporters to recalculate previously reported data. One commenter stated that Option 2 would enable the EPA to automatically revise CO₂e emissions without the need for company review, pointing out that a programming modification would easily update emissions data universally without the need for responses from each individual facility and eliminate the time consuming reentry of data at the plant level. Another commenter insisted that the EPA must publish the revised estimates with a caveat explaining how the estimates were obtained and explaining that the emission values are not those submitted and certified by reporters.

One commenter suggested the EPA revise the emissions data (as described in Option 2) and then present it in the published database as a parallel metric, leaving the certified facility-reported data unchanged. The commenter explained that this approach would ensure that a facility's reported emission data appropriately remains the official emission report for that facility while creating a "continuous" emission series dating to reporting year 2010. Another commenter suggested including the revised estimates on FLIGHT and listing both the previous and new GWPs. The commenter noted that addressing the emissions in this way would eliminate the need to revise even more reports if the EPA decides to update the GWPs again in the future.

Many commenters opposed both options, asserting that retroactively revising data submitted in prior reports would undermine regulatory and business certainty. Commenters stated that it is inappropriate to require that emission estimates previously calculated in good faith be reassessed based on a revised rule. The commenters maintained that either option would create a substantial reporting burden without any real benefit. One commenter argued that

either option could have the unintended consequence of altering GHG mitigation strategies currently being deployed by facilities. Several commenters opposed recalculating prior reporting year emissions because these emissions are in the public domain, and the GWP values used to derive them were also used by sources for purposes of evaluating applicability of PSD and title V under the Tailoring Rule. Commenters argued that changing the emission totals that have already been published would also undermine transparency in the regulatory process and the public's confidence in the overall database.

Commenters also disagreed that these revisions would allow for the comparison of emission data submitted for those reporting years with data submitted for reporting year 2013 and future reporting years. Some commenters indicated that the EPA has neglected to consider other proposed significant changes that can affect the overall emission estimates, citing, for example, the proposal to increase the cover methane oxidation rates at landfills from 10 percent to up to 35 percent. The commenters contended that revised GHG emissions data will have little value if revisions address one change (e.g., GWP values) but not others (e.g., revised emission factors or oxidation rates). Another commenter emphasized the impacts of the retroactive application of changes on other EPA regulations as well as state programs such as California's AB 32 GHG reduction program. Commenters recommended that new GWPs, and in fact all revisions within the GHG Reporting Rule, be applied prospectively to future emission reports, contending that this is more logical from a legal, scientific, and workload perspective. Finally, no commenter supported Option 1.

Response: After reviewing the comments submitted by stakeholders, we have selected Option 2 as the best means of meeting the need for GHG emissions data that accurately reflect the relative effect of each GHG. Option 2 will allow the EPA to provide a complete, consistent data set for prior years with the amended GWPs, including reports submitted for facilities and suppliers that have ceased operations, for comparison to data reported for 2013 and future years without increasing the burden on reporters or revising previously submitted reports.

In response to the concerns raised by commenters, we emphasize that although we will recalculate the 2010 through 2012 CO₂e values using the revised GHGs, we will not be making

revisions to the annual reports submitted and certified by reporters to reflect the revised GWPs finalized in this rulemaking. We intend to publish the submitted and certified annual reports in FLIGHT and publish a version of the CO₂e emissions and supply estimates for the reporting years 2010, 2011, and 2012 using the revised GWPs in Table A-1 separately. The EPA will clearly delineate data submitted to the EPA by reporters and data recalculated by EPA. The revised emission and supply estimates will be used to create a consistent time series of CO₂e estimates using the amended GWPs. We may present the annual report totals and the revised CO₂e estimates in parallel thru FLIGHT; however, any revised CO₂e values published will be clearly identified with a caveat explaining how the revised CO₂e values were calculated and the reason why the values were recalculated. As such, the dataset provided will be an analysis of the data submitted by reporters, and will not constitute changes to the annual reports. The certified 2010 through 2012 reports (excluding confidential business information) will continue to be made available to the public through our Web site and will reflect the data as reported and certified by the reporter.

This approach allows the EPA to publish revised emission and supply totals without increasing burden on reporters for the submittal of revised reports and allows for comparison of emissions on an individual facility basis from reporting years 2010 through 2012 with those published in 2013 and beyond. This revised CO₂e data will provide a more accurate picture of facility-level emissions for each industry over time.

This approach also clarifies that the GWPs finalized in this rulemaking are only applied prospectively, and do not affect the applicability for reporters that was determined for prior years. The revised emission and supply totals for years 2010 through 2012 will be wholly separate from the published values supplied by reporters for annual reports that may be used by sources for purposes of evaluating applicability of under other GHG programs, such as the EPA's Tailoring Rule. As discussed in Section II.A.2.c of this preamble, applicability determinations and permits issued prior to the effective date of the revised Table A-1 will not be affected by the new GWPs. Therefore, the revised totals will not retroactively affect determinations of permitting applicability.

We disagree with the commenters' statement that the decision to recalculate CO₂e values for 2010

through 2012 creates confusion, undermines regulatory or business certainty, or will alter GHG mitigation methods. No additional burden is placed on reporters since reporters are not required to resubmit reports for 2010 through 2012 reporting years. In the 2013 reporting year and subsequent years, reporters will use the revised GWP values in Table A-1 of subpart A to calculate emissions in CO₂e. In most cases, however, reporters use the e-GGRT webforms or spreadsheets that automatically calculate CO₂e values based on the GHG emissions and supply data entered by the facility. Only facilities that use the XML schema for reporting will need to make revisions for the 2013 reporting year.

We note that the reported emissions of each individual GHG emitted by the facility or supplied by a supplier for reporting years 2010, 2011, and 2012 remain unchanged. Only the relative weighting of the impacts of each GHG are changed by revisions to the GWPs. Using consistent and up-to-date GWP values, reviewed and approved by the scientific community, enables us to better evaluate the relative impact of GHG emissions on global warming, make better informed decisions on future mitigation methods, and track emission trends.

Although the EPA is revising the GWPs and making other minor rule revisions in this final rule, none of these changes apply retroactively to reporters. The EPA is not requiring new reporters who became subject to reporting only as the result of changes in the GWP values to submit reports for previous reporting years. Nor are we requiring existing reporters to submit and certify revised annual reports for previous reporting years or review and certify revised CO₂e values calculated by the EPA.

Comment: Although most commenters supported Option 2 (either outright or as compared to Option 1), many suggested that EPA provide an opportunity for reporting entities to review and provide comment on CO₂e values recalculated by the EPA before those values are published. These commenters stated that review is important to avoid errors being made in the published data. Some commenters also stated that reporters should be given the option to voluntarily revise their previous annual reports themselves.

Response: The EPA intends to provide an opportunity for facilities to view their recalculated facility-level CO₂e totals before publication. The Agency does not believe it will be useful to formally solicit comments on the recalculated GWPs. Because application

of the new GWPs will be a very simple recalculation that has no bearing on a facility's annual report, the EPA does not want to place any additional burden on reporters. However, if a reporter were to find an error, we would as always welcome feedback through our Help Desk. We do not plan to make a formal solicitation for comment from reporters prior to publication of the recalculated CO₂e emissions and supply because these republished values will be clearly labeled as the results of EPA analysis to avoid their confusion with the certified emissions reports submitted by facilities. The EPA will review the recalculated CO₂e values to ensure they are accurate before making them available to the public. We have decided not to allow reporters to submit revised certified reports for reporting years 2010, 2011, and 2012 with CO₂e values calculated using the revised GWPs. Based on the comments we received on

Option 1, we consider it unlikely that many reporters would voluntarily revise their 2010 through 2012 reports, and to allow a few reporters to do so would be confusing to the public when reviewing non-CBI versions of the annual reports published on our Web site.

IV. Confidentiality Determinations

A. Final Confidentiality Determinations for New and Revised Data Elements

The EPA received only supportive comments on the proposed confidentiality determinations, and is finalizing the confidentiality determinations as proposed for all but 2 of the new and substantially revised data elements that were proposed. The EPA is not finalizing two proposed data elements: one in subpart AA, annual production of paper products exiting the paper machine(s) prior to application of any off-machine coatings (40 CFR

98.276(k)(2) proposed) as discussed in Section II.N of this preamble; and one in subpart FF, amount of CH₄ routed to each destruction device (40 CFR 98.326(t) proposed) as discussed in Section II.Q of this preamble. As a result, the EPA is not finalizing category assignments or confidentiality determinations for these two data elements.

In addition, there are some data elements in subparts A, C, X, FF, HH, NN, and TT that have been clarified since proposal, although the same information will be collected. These data elements and how they have been clarified in the final rule are listed in the following table. Because the information to be collected has not changed since proposal, we are finalizing the proposed confidentiality determinations for these data elements as proposed (see Table 3 of this preamble).

TABLE 3—REVISED DATA ELEMENTS WITH FINAL CATEGORY ASSIGNMENT AND CONFIDENTIALITY DETERMINATION

Citation	Data category assigned to during proposal	Data element description, as proposed	Data element description, as finalized
40 CFR 98.3(c)(1) (proposed); 40 CFR 98.3(c)(1) (finalized).	Facility and Unit Identifier Information.	If a facility does not have a physical street address, then the facility must provide the latitude and longitude representing the location of facility operations in decimal degree format.	If the facility does not have a physical street address, then the facility must provide the latitude and longitude representing the geographic centroid or center point of facility operations in decimal degree format.
40 CFR 98.3(c)(13) (proposed); 40 CFR 98.3(c)(13) and (e.g., annual operation hours of the gas collection system (98.346(i)(7)), 40 CFR 98.36(b)(11), 40 CFR 98.36 (c) (1)(xi), 40 CFR 98.36 (c)(2)(x), 40 CFR 98.36 (c)(3)(x), 40 CFR 98.36 (d)(1)(x), 40 CFR 98.36 (d)(2)(ii)(J), and 40 CFR 98.36 (d)(2)(iii)(J) (finalized).	Facility and Unit Identifier Information.	For combustion units used to generate electricity for delivery to the grid, ORIS code for each combustion unit serving an electric generator.	An indication of whether the facility includes one or more plant sites that have been assigned a "plant code" (as defined under 40 CFR 98.6) by either the Department of Energy's (DOE) Energy Information Administration (EIA) or by the EPA's Clean Air Markets Division (CAMD). 40 CFR 98.36(b)(11): Plant code (as defined in 98.6), 40 CFR 98.36(c)(1)(xi): Plant code (as defined in 98.6), 40 CFR 98.36(c)(2)(x): Plant code (as defined in 98.6), 40 CFR 98.36(c)(3)(x): Plant code (as defined in 98.6), 40 CFR 98.36(d)(1)(x): Plant code (as defined in 98.6), 40 CFR 98.36(d)(2)(ii)(J): Plant code (as defined in 98.6), 40 CFR 98.36(d)(2)(iii)(J): Plant code (as defined in 98.6).
40 CFR 98.246(b)(4) (proposed); 40 CFR 98.246(b)(4) finalized.	Emissions	For each CEMS monitoring location that meets the conditions in paragraph (b)(2) or (3) of this section, provide an estimate based on engineering judgment of the fraction of the total CO ₂ emissions that is attributable to the petrochemical process unit.	For each CEMS monitoring location that meets the conditions in paragraph (b)(2) or (3) of this section, provide an estimate based on engineering judgment of the fraction of the total CO ₂ emissions that results from CO ₂ directly emitted by the petrochemical process unit plus CO ₂ generated by the combustion of off-gas from the petrochemical process unit.

TABLE 3—REVISED DATA ELEMENTS WITH FINAL CATEGORY ASSIGNMENT AND CONFIDENTIALITY DETERMINATION—Continued

Citation	Data category assigned to during proposal	Data element description, as proposed	Data element description, as finalized
40 CFR 98.326(r)(2)(proposed); 40 CFR 98.326(r)(2) (finalized).	Unit/process Operating Characteristics That are Not Inputs to Emission Equations; Not Emissions Data and Not CBI.	Start date of each well and shaft	Start date of each well, shaft, and vent hole.
40 CFR 98.326(r)(2) (proposed); 40 CFR 98.326(r)(2) (finalized).		Close date of each well and shaft	Close date of each well, shaft, and vent hole.
40 CFR 98.326(r)(3) (proposed); 40 CFR 98.326(r)(3) (finalized).		Number of days each or shaft was in operation during the reporting year.	Number of days each well, shaft, or vent hole was in operation during the reporting year.
40 CFR 98.466(h) (proposed); 40 CFR 98.466(h)(1) (finalized).	Emissions	For landfills with gas collection systems, methane generation, using equation TT-6.	For landfills with gas collection systems, methane generation, adjusted for oxidation, calculated using equation TT-6.
40 CFR 98.466(h) (proposed); 40 CFR 98.466(h)(2) (finalized).	Inputs to Emission Equations.	For landfills with gas collection systems, oxidation factor.	For landfills with gas collection systems, oxidation factor used in Equation TT-6.
40 CFR 98.406(b)(7)	Customer and Vendor Information.	LCDs: Annual volume in Mscf of natural gas delivered by the LDC to each sales or transportation customer's facility that received from the LDC deliveries equal to or greater than 460,000 Mscf during the calendar year, if known; otherwise, the annual volume in Mscf of natural gas delivered by the LDC to each meter registering supply equal to or greater than 460,000 Mscf during the calendar year.	LCDs: Annual volume in Mscf of natural gas delivered by the LDC to each large end-user as defined in 40 CFR 98.403(b)(2)(i).
40 CFR 98.406(b)(12)	Customer and Vendor Information.	LCDs: Meter number for each end-user reported in paragraph (b)(7).	LCDs: Meter number for each large end-user reported in paragraph (b)(7).
40 CFR 98.406(b)(12)	Customer and Vendor Information.	LCDs: Whether the quantity of natural gas reported in paragraph (b)(7) is the total quantity delivered or the quantity delivered to a specific meter.	LCDs: Whether the quantity of natural gas reported in paragraph (b)(7) is the total quantity delivered or the quantity delivered to a large end-user's facility, or the quantity delivered to a specific meter located at the facility.

In the proposed rule, the EPA assigned thirteen proposed new data elements to the inputs to emission equations data category and received no comment on the proposed category assignments. As discussed above, one proposed new data element, from subpart FF, which was proposed to be assigned to the inputs to emission equations category is no longer included in this action. Additionally, as discussed in Section II.R of this preamble, the final revision to 40 CFR 98.346(i) includes three more new data elements than were proposed in subpart HH. The current rule had assumed only one measurement location and two possible destruction devices and therefore required reporting of only the operating hours for the “primary” and “back-up” destruction devices and a

single value for destruction efficiency and methane recovery using Equation HH-4, all of which were categorized as inputs to emission equations. With these final revisions, the EPA is now requiring facilities to report the number of destruction devices and the operating hours and destruction efficiency for each device associated with a given measurement location (40 CFR 98.346(i)(5) and (7)). The EPA is also finalizing an amendment that methane recovery calculated using Equation HH-4 be reported separately for each measurement location (40 CFR 98.346(i)(6)). Because the three additional data elements are the same type of information as had been collected previously, the only difference being that they are now collected by measurement location, the EPA

similarly assigns them to the inputs to emission equations data category in the final rule. As a result, there are now a total of 15 new data elements assigned to the inputs to emission equations category.

The EPA had previously expressed an intent to conduct an “in-depth evaluation of the potential impact from the release of inputs to equations” (76FR 53057 and 53060, August 25, 2011); (77 FR 48072, August 13, 2012). We conducted an evaluation of these fifteen new inputs following the process outline in the memorandum “Process for Evaluating and Potentially Amending Part 98 Inputs to Emission Equations” (Docket Id. No. EPA-HQ-OAR-2010-0929). This evaluation is summarized in the memorandum “Summary of Evaluation of Inputs to

Emission Equations' Data Elements Added with the 2013 Revisions to the Greenhouse Gas Reporting Rule." (See Docket Id. No. EPA-HQ-OAR-2012-0934.)

Please see the memorandum titled "Final data category assignments and confidentiality determinations for new and substantially revised data elements in the '2013 Revisions to the Greenhouse Gas Reporting Rule and Confidentiality Determinations for New or Substantially Revised Data Elements'" ("Confidentiality Determinations Memorandum") in Docket Id. No. EPA-HQ-OAR-2012-0934 for a list of the new or substantially revised data elements, their final category assignments, and their confidentiality determinations (whether categorical or individual) except for those assigned to the inputs to equations category.

B. Public Comments on the Proposed Confidentiality Determinations and Responses to Public Comment

The EPA is finalizing all confidentiality determinations as they were proposed. Please refer to the preamble to the proposed rule (77 FR 63570) for additional information regarding the proposed confidentiality determinations. For comments and responses regarding confidentiality determinations for new and revised data elements, please refer to the comment response document in Docket Id. No. EPA-HQ-OAR-2012-0934.

V. Impacts of the Final Rule

A. Impacts of the Final Amendments Due to Revised Global Warming Potentials

This section of the preamble examines the costs and economic impacts of the final rulemaking and the estimated economic impacts of the rule on affected entities, including estimated impacts on small entities.

As discussed in the proposed rule, the amendments to Table A-1 of Part 98 may affect both the number of facilities required to report under Part 98 and the quantities of GHGs reported. This is because the GWPs in Table A-1 are used to calculate emissions (or supply) of GHGs in CO₂e for determination of whether a facility meets a CO₂e-based threshold and is required to report and to calculate total facility emissions for submittal in the annual report. The amendments to Table A-1 include adopting GWPs that generally are higher than the values currently in the table and will result in higher reported emissions of CO₂e for facilities that emit compounds for which the revised GWP

is greater. In some cases, this will increase the number of facilities required to report under Part 98 and the total emissions reported for these facilities.

The EPA received several comments on the impacts of the proposed rule. Specifically, we received comments stating that EPA significantly underestimated both the number of newly subject subpart HH MSW Landfills and the added costs of compliance imposed on both new and existing reporters, who are affected by the increase in the GWP for methane. As a result of these comments, the EPA has revised the impacts analysis for subpart HH, Municipal Landfills. The EPA has also updated the impacts assessment to calculate the total emissions increase from all reporters using 2011 reported data that became available following the publication of the proposed rule. In the proposed rule, the impacts assessment for the subparts that began reporting in RY 2011 relied on information from the EPA's Economic Impacts Analyses and technical support documents for each of those subparts from the final Part 98. The new data is based on emissions estimates and data submitted in 2011 annual reports and is more accurate for the purposes of calculating the impacts from this final rule. We have also revised the analysis to exclude the 26 additional fluorinated GHGs that were proposed to be included in Table A-1, as we are not finalizing GWPs for these compounds in this rulemaking (see Section I.D of this preamble). Although some commenters requested that the impacts analysis should include the costs associated with implementation issues related to other EPA programs (e.g., EPA's Tailoring Rule), we have determined that it is not appropriate to include these impacts under this Part 98 rulemaking. See Section V.C of this preamble for the EPA's response to these comments.

The final amendments to Table A-1 will result in a collective increase in annual reported emissions from all subparts of more than 79 million metric tons CO₂e (a 1.1 percent increase in existing emissions), which the EPA has concluded more accurately reflects the estimated radiative forcing from the emissions reported under Part 98. The increase includes 4.8 million metric tons CO₂e from an estimated 184 additional facilities that may be newly required to report under Part 98 based on the revised GWPs. The number of new reporters estimated, the estimated increase in emissions or supply from existing reporters (reporters who submitted 2010 and 2011 reports) and new reporters, and the estimated total

change in source category emissions or supply for each subpart are summarized in the memorandum "Assessment of Emissions and Cost Impacts of 2013 Revisions to the Greenhouse Gas Reporting Rule and Confidentiality Determinations for New or Substantially Revised Data Elements" (hereinafter referred to as "Impacts Analysis") (see Docket Id. No. EPA-HQ-OAR-2012-0934).

Additional reporters are expected to report under subparts I, W, HH, II, OO, and TT due to an increase in the number of facilities exceeding the CO₂e threshold. The majority of these additional reporters are expected from subpart W, Petroleum and Natural Gas Systems, and subpart HH, Municipal Solid Waste Landfills. There are no expected additional reporters from the remaining subparts. The revisions do not reduce the number of reporters that meet CO₂e thresholds for any subpart. A detailed analysis of the impacts for each subpart, including the number of additional reporters expected, the quantities of annual GHGs reported, and the compliance costs for expected additional reporters, is included in the Impacts Analysis for the final rule (see Docket Id. No. EPA-HQ-OAR-2012-0934).

The total cost of compliance for the additional reporters is expected to be \$2.2 million for the first year and \$1.3 million per year for subsequent years. The annual costs for the additional reporters is an approximate increase of 1.3 percent above the existing reporters cost of compliance with Part 98. The costs of the final amendments and the associated methodology are summarized in Section V.A.2 of this preamble.

1. How were the number of reporters and the change in annual emissions or supply estimated?

As in the proposed rule, the EPA evaluated the number of reporters affected by the final amendments by examining the 2010 and 2011 reporters that are already required to report under Part 98. For the number of affected facilities, the EPA examined available e-GGRT data from the 2010 and 2011 reporting years and summary data that were developed to support the existing Part 98 to determine the number of existing affected facilities. We then evaluated the number of additional facilities that are required to report under each subpart by determining what additional facilities could exceed Part 98 source category thresholds, using the criteria presented in the 2013 Revisions proposal (see 78 FR 19841, April 2, 2013). The subparts that could have new reporters as a result of the changes to

Table A–1 are subparts I, W, HH, II, OO, and TT. We identified the number of additional reporters expected under each subpart following the methodology outlined in the proposed rule (78 FR 19841).

The EPA determined the estimated increases in reported emissions for each subpart by examining the available data from facilities that submitted an annual report for reporting year 2011. For these reporters, we estimated the increase in calculated emissions from each facility by adjusting the reported GHG mass emissions to CO₂e using the proposed AR4 GWPs. We also estimated the increase in emissions that would result from additional reporters in each subpart expected to exceed the source category threshold. For those facilities, the available source-specific emissions data for the expected new reporters was calculated in terms of CO₂e and the

estimated emissions were included in the total source category emissions. Additional information on the EPA’s analysis of the estimated number of reporters and the increase in reported CO₂e for each subpart is in the Impacts Analysis for the final rule (see Docket Id. No. EPA–HQ–OAR–2012–0934).

2. How were the costs of this final rule estimated?

The compliance costs associated with the final amendments were determined for those additional reporters who are required to submit an annual report under Part 98. The total compliance costs for additional reporters are estimated to be \$2.2 million for the first year and \$1.3 million for subsequent years (2011 dollars).

Costs for additional reporters are summarized in Table 4 of this preamble, which presents the first-year and subsequent-year costs for each source

category. To estimate the cost impacts for additional reporters, the EPA used the same methodology from the 2013 Revisions proposal. In addition to the costs for new reporters, the EPA estimated costs for closed landfills, or landfills expected to close within the next ten years, that would have an extended number of years of required reporting due to the increase in the GWP for methane. The cost for these additional years of reporting is included in Table 4 of this preamble. Costs are not included for landfills that were closed prior to January 1, 2013, have not previously reported under Part 98, and who generated less than 1,190 metric tons of CH₄ in the 2010, 2011, 2012 and 2013 reporting years. Landfills meeting these conditions are not required to report per the final revisions to subpart HH applicability (see Section II.R of this preamble for additional information).

TABLE 4—COST IMPACTS OF FINAL AMENDMENTS FOR ADDITIONAL REPORTERS

Subpart	Number of additional reporters due to revised GWP	Incremental cost impact for additional reporters (\$/yr for first year)	Incremental cost impact for additional reporters (\$/yr for subsequent years)
I—Electronics Manufacturing	4	129,500	237,000
W—Petroleum & Natural Gas Systems	99	1,648,000	772,000
HH—Municipal Solid Waste Landfills	57	246,000	182,200
II—Industrial Wastewater	2	10,800	10,500
OO—Industrial GHG Suppliers	3	13,100	10,000
TT—Industrial Waste Landfills	19	112,000	98,050
Total	184	2,195,400	1,316,750

^a Subpart HH cost impact includes the reporting costs for 43 closed landfills that will exit the reporting program later than expected. Similarly, subpart TT cost impact includes the cost for 8 closed facilities.

For existing reporters that have submitted an annual report for reporting year 2010 or 2011, there will be no significant cost impacts resulting from the proposed amendments to Table A–1; using the revised GWPs does not affect the cost of monitoring and recordkeeping and does not materially affect the cost for calculating emissions for these facilities. See the Impacts Analysis (Docket Id. No. EPA–HQ–OAR–2012–0934) for more details.

B. What are the impacts of the other amendments and revisions in this final rule?

There are no other changes from proposed rule to the impacts from the remaining amendments and revisions in this final rule. This final rule continues to include clarifications to terms and definitions for certain emission equations, simplifications to calculation methods and data reporting requirements, or corrections for

consistency between provisions within a subpart or between subparts in Part 98. These amendments do not fundamentally affect the applicability, monitoring requirements, or data collected and reported, or increase the recordkeeping and reporting burden associated with Part 98. Additionally, the final confidentiality determinations for new or substantially revised data elements do not affect whether and how data are reported and therefore, do not impose any additional burden on sources. See the EPA’s full analysis of the additional impacts of the corrections, clarifying, and other amendments in the Impacts Analysis in Docket Id. No. EPA–HQ–OAR–2012–0934).

C. Summary of Comments and Responses Regarding Impacts

This section summarizes the significant comments and responses related to the impacts and burden of the

proposed revisions. See the comment response document in Docket Id. No. EPA–HQ–OAR–2012–0934 for a complete listing of all comments and responses related to the impacts of this rulemaking.

Comment: Several commenters argued that the proposed rule does not calculate the complete cost of amending Table A–1, stating that the proposal merely estimates the costs that would be incurred by facilities that become subject to the Reporting Rule due to the amended GWP values. The commenters explained that the EPA should also calculate the costs incurred by facilities that become major sources of GHGs as a result of the amended GWP values and solicit public comment on the new cost calculations. The commenters asserted that the costs of performing a PSD review and obtaining a title V permit are substantial, and that the costs of obtaining a synthetic minor permit, while lower, are not insignificant. In

addition, commenters pointed out that some projects will be delayed or modified because of the requirement to obtain a permit before commencing construction, and that costs are especially significant in cases where a company planned and designed a project with the expectation that the facility would be a minor source for purposes of PSD, but must now conduct a PSD review because the facility is a major source under the new GWP values. One commenter stated that these added burdens are unwarranted, particularly since the added burdens are not a response to any increase in emissions. Other commenters maintained that it is insufficient for the EPA to simply state that EPA will work with permitting authorities and other stakeholders as necessary to provide guidance, that the EPA must provide some meaningful analysis of the impacts on these changes on regulators and industry under other affected regulatory programs, and that issues and concerns needing guidance should be addressed through public comment before promulgation of the final rule.

Response: The EPA disagrees with commenters that the Impacts Analysis for the GHG Reporting Rule must include the costs incurred by facilities that become major sources of GHGs as a result of the amended GWP values. The cost impacts and burden associated with exceeding permitting thresholds were analyzed under the Tailoring Rule. Even though the Tailoring Rule analysis was based on the GWP values that were effective at the time of the analysis (from the 2009 GHG Reporting Rule), we do not believe that the amended GWP values would significantly change the Tailoring Rule analysis and the overall conclusions on permitting burden relief reached in terms of establishing thresholds for GHG permitting.

With regard to the commenters' suggestion that some projects will be delayed or modified because of the amended GWP values, the EPA believes that permit applicants who may be potentially impacted by the amended GWP changes have been made aware of the anticipated GWP changes through the notice and comment regulatory process of amending Part 98. The effects of the updates to Table A-1 on the Tailoring Rule were addressed in the Response to Public Comments on the Tailoring Rule (see Docket Id. No. EPA-HQ-OAR-2009-0517-19181, p. 101): "Any changes to Table A-1 of the mandatory GHG reporting rule regulatory text must go through an appropriate notice-and-comment regulatory process. . . . the lead time for adopting changes to that rule will

provide a transition time to address implementation concerns raised by commenters."

As noted in Section II.A.2.c of this preamble, to the extent that a Table A-1 amendment raises permitting implementation questions or concerns, the EPA will work with permitting authorities and other stakeholders as necessary to provide guidance on their issues and concerns.

Comment: Several comments stated that the EPA did not accurately assess the impact of the GWP revisions on MSW landfills. Commenters indicated that the EPA significantly underestimated both the number of newly subject subpart HH MSW Landfills and the added costs of compliance imposed by these changes on both new and existing reporters. The commenters disputed the EPA's conclusion in the Impacts Analysis accompanying the proposal that no closed landfills would be affected by the change in GWPs. According to commenters, several closed landfills with methane generations between 21,000 and 24,999 metric tons/year CO₂e could exceed the threshold due to the proposed revision of the GWP for methane. One commenter claimed that, although emissions from these landfills will steadily decline, they could be required to report for at least three to five years as a result of the revised GWP for methane, and would thus face a significant impact. Commenters also pointed out that this situation is also likely to arise for small municipalities that own closed facilities.

Commenters also stated that the EPA failed to recognize that revising GWPs will delay the date by which low-emitting MSW landfills can exit the reporting program. They explained that while the proposal Impacts Analysis estimated methane generation at a closed landfill decreases 18% in 5 years, an increase in GWP from 21 to 25 will increase modeled emissions by 20% and will therefore delay exit from the reporting program obligations by more than 5 years.

Commenters also asserted that EPA underestimated the cost of complying with the proposed amended reporting requirements under subpart HH. They stated that, based on industry reporting experience, they believe actual annual costs to comply with the monitoring recordkeeping and reporting requirements are four to five times higher than the EPA estimates in Table 11 of the proposal preamble and Tables 4-1 and 6-16 of the Impacts Analysis, which state the incremental annual cost impact for new subpart HH reporters is \$309,700 (or \$5,434 per facility) for the

initial year of reporting and \$137,500 (or \$2,413 per site) in subsequent years of reporting (2011 US Dollars). Two commenters attested that data they had submitted to the EPA previously on ongoing reporting showed that the annual cost per landfill for subsequent years of reporting ranged from \$10,000 to \$15,000 per site. One commenter stated that the EPA also did not account for the cost of responding to EPA questions raised on facility reports, which require a facility to respond within 45 days and may require corrections and report re-submittal.

Response: Upon further analysis, the EPA agrees that there may be closed landfills with methane generation between 21,000 and 24,999 metric tons/year CO₂e, and that under the proposed rule these closed facilities would be subject to new reporting requirements. For this reason, a provision has been included in the final amendments to subpart HH that specifically exempts landfills that did not accept waste on or after January 1, 2013 and had methane generation less than 1,190 metric tons of methane (25,000 CO₂e). See Section II.R of this preamble for additional discussion.

The EPA also agrees that the economic impact assessment for the changes to the GWP of methane did not include the cost that closed, or soon to be closed, landfills would incur due to the extended number of years that reporting will be required. In response to this comment, we have estimated that there are approximately 196 closed MSW landfills, and 233 open MSW landfills, expected to close within the next ten years, that will be required to submit reports for an additional 5 years. Of these facilities, we estimated there are 43 facilities that will incur one or more additional years of reporting within the next ten years. The average additional annual cost for these facilities is estimated at \$37,360. The EPA has also made a similar estimate of costs for industrial landfills (subpart TT), and has concluded that there are eight facilities that may be required to report for one or more additional years within the next ten years. The annual average cost associated with these reports is \$12,000. The details of these changes to the cost impact are available in the Impacts Analysis in Docket Id. No. EPA-HQ-OAR-2012-0934.

With regard to the comment that the EPA underestimated the cost to submit reports for all facilities and that the costs incurred by facilities are four to five times higher than the EPA originally estimated, this information was taken into consideration in the most recent Information Collection Request

(ICR) (see Docket Id. No. EPA–HQ–OAR–2012–0333) and no changes were made to the estimated cost to report based on the information submitted (see EPA’s response to comments on the GHGRP renewal ICR, dated May 2013, in Docket Id. No. EPA–HQ–OAR–2012–0333). The major factor influencing the cost from both companies was the frequency of monitoring required for estimating emissions from Municipal Solid Waste Landfills (subpart HH). The EPA disagrees with the feedback provided. In making the cost estimates, the EPA assumes that the operators will pick the lowest cost operations for monitoring emissions. Part of this assumption includes that landfill operators will be visiting the landfills at least once a week under normal operation to check and maintain equipment. The majority of landfills in the U.S. are active and would not require additional visits to monitor emissions. We concluded, after evaluating comments about underestimating the reporting burden, that the Agency’s methodology and assumptions used in the Economic Impact Analysis were sound and relied on the best available data. Therefore, it is reasonable of EPA to use the Economic Impact Analysis to estimate total cost burden on landfills affected by the changes to the revised GWP, and the Economic Impact Analysis provides a reasonable characterization of costs and adequate explanation of how the costs were estimated. As we discussed in Section VII of the final Part 98 preamble (74 FR 56362, October 30, 2009), the EPA collected and evaluated cost data from multiple sources, thoroughly reviewed the input received through public comments, and weighed the analysis against this input.

Comment: Some commenters asserted that any time the EPA changes factors to be used in estimating a facility’s GHG emissions for reporting purposes (such as GWPs, fuel emission factors, or high heating values), companies have to expend substantial efforts to revise systems they have developed and put in place, often at considerable cost, to collect the required information, apply the GHG emission estimation methods the EPA requires, and consolidate and report GHG emission estimates to the EPA. They explained that in addition to imposing substantial burdens on businesses and public and private institutions, it also introduces the potential for errors every time existing reporting systems have to be modified. The commenters argued that the EPA is neglecting to account for the costs

incurred by existing reporters to implement these changes.

One commenter contended that, if the primary use for GHG emissions reported under the GHGRP is for comparative purposes (i.e. determining trends in GHG emissions, comparing U.S. emissions to those of other countries, etc.), making relatively small revisions to the methods for calculating estimated GHG emissions is not going to produce a benefit that warrants the burden imposed on regulated facilities to adjust to those revisions. The commenter recommended that the EPA not promulgate future changes to GWPs, nor other changes to the methodologies for estimating GHG emissions in the Greenhouse Gas Reporting Rule, if the change is unlikely to produce more than a five percent change in estimated emissions.

Response: As the EPA stated in the preamble for the proposed amendments (78 FR 19802, April 2, 2013), the amendments reflect the EPA’s engagement with reporters and stakeholders and our understanding of the technical challenges and burden associated with implementation of Part 98 provisions. The changes improve the GHGRP by clarifying compliance obligations and reducing confusion for reporters, improving the consistency of the data collected, and ensuring that data collected through the GHGRP is representative of industry and comparable to other inventories. The proposed changes simplify data collection and reporting for reporters and reduce the burden associated with implementing certain provisions of 40 CFR part 98. These clarifications and corrections do not fundamentally affect the applicability, monitoring requirements, or data collected and reported or increase the recordkeeping and reporting burden associated with Part 98. The EPA estimated the impacts of the corrections, clarifying, and other amendments in the Impacts Analysis in Docket Id. No. EPA–HQ–OAR–2012–0934 and determined that the impacts from these changes to each subpart was minimal. As such, the EPA has determined the amendments to the final rule do not present an undue cost burden on reporters.

VI. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a “significant regulatory action” under the terms of Executive Order 12866 (58 FR 51735,

October 4, 1993) and is therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011). This action (1) clarifies or changes specific provisions in the Greenhouse Gas Reporting Rule, including amending Table A–1 of Subpart A to incorporate revised GWPs from the IPCC AR4, and (2) finalizes confidentiality determinations for the reporting of new or substantially revised (i.e., requiring additional or different data to be reported) data elements contained in the final amendments. The EPA prepared an analysis of the potential compliance costs associated with the final amendments and amendments to revise global warming potentials in subpart A. This analysis is contained in the Impacts Analysis (see Docket Id. No. EPA–HQ–OAR–2012–0934). A copy of the analysis is available in the docket for this action and the analysis is briefly summarized here. The total compliance costs for additional reporters are \$1,316,700 (\$2011). The highest costs are anticipated for 99 facilities affected by subpart W, Petroleum and Natural Gas Systems, (\$772,000), 4 facilities affected by subpart I, Electronics Manufacturing (\$237,000), and 57 facilities affected by subpart HH, Municipal Solid Waste Landfills (\$182,200). New facilities required to report under subparts II, OO, and TT incur a combined cost of \$118,550. The final confidentiality determinations for new and substantially revised data elements do not increase the existing compliance costs. The compliance costs associated with the final amendments are less than the significance threshold of \$100 million per year. The compliance costs for individual facilities are not expected to impose a significant economic burden.

B. Paperwork Reduction Act

The Office of Management and Budget (OMB) has approved the information collection requirements for 40 CFR part 98 under the provisions of the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.*, and has assigned OMB control number 2060–0629, ICR 2300.10. The OMB control numbers for EPA’s regulations in 40 CFR are listed in 40 CFR part 9. The revisions in this final action result in a small increase in burden, and the ICR will be modified to reflect this burden change.

This action finalizes amended GWP values in subpart A and other corrections and harmonizing revisions, and finalizes confidentiality determinations for the reporting of new or substantially revised (i.e., requiring additional or different data to be

reported) data elements contained in the final amendments. These final amendments and confidentiality determinations do not make any substantive changes to the reporting requirements in any of the subparts for which amendments are being finalized. The final amendments to subpart A include revision of existing GWP in Table A-1 of subpart A. As discussed in Section V of this preamble, the final amendments could affect the total number of facilities reporting under Part 98 and increase the collective annual emissions or supply reported. The EPA prepared an analysis of the compliance costs associated with the final amendments to Table A-1 in the Impacts Analysis (see Docket Id. No. EPA-HQ-OAR-2012-0934).

Other amendments to subpart A include adding requirements that provide reporters instruction regarding reporting of location, ownership, and facility identification (i.e., reporting of plant codes). The remaining changes also include revising and adding definitions. The revisions are clarifications or require reporting of information that facilities are expected to have readily available (e.g., latitude and longitude of the facility, unit-level and configuration-level "plant code"), and are not expected to result in significant burden for reporters.

The amendments to the reporting requirements in the source category-specific subparts generally do not change the nature of the data reported and are not anticipated to result in significant burden for reporters. For example, several of the amendments are clarifications or corrections to existing reporting requirements. For example, for subpart H, the EPA is requiring reporting of annual, facility-wide cement production instead of monthly, kiln-specific cement production for facilities that use a CEMS to measure CO₂ emissions. Because facilities are already expected to track facility-wide cement production for budgeting purposes, we do not expect this revision to result in any additional burden for cement production facilities. In some cases we are including reporting requirements for data that are already collected by reporters. For instance, for subpart RR, the EPA is adding a reporting requirement for facilities to report the standard or method used to calculate the mass or volume of contents in containers that is redelivered to another facility without being injected into the well. The new data element does not require additional data collection or monitoring from reporters, and is not a significant change.

The EPA is also finalizing changes that would reduce the reporting burden. For example, for subpart BB (Silicon Carbide Production), the EPA is removing the requirement for facilities to report CH₄ emissions from silicon carbide process units or furnaces. Additionally, the EPA is amending subpart BB such that facilities would calculate and report CO₂ emissions for all process units and furnaces combined, instead of each process unit or production furnace. We expect that both of these major changes will reduce the reporting burden for facilities subject to subpart BB.

Additional changes to the reporting requirements in each subpart are detailed in the Impacts Analysis (see Docket Id. No. EPA-HQ-OAR-2012-0934).

C. Regulatory Flexibility Act (RFA)

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impact of this final rule on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration's regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. The small entities directly regulated by this final rule are small businesses. We have determined that up to 80 small municipal solid waste landfills, representing up to a 1 percent increase in regulated businesses in this industry, will experience an impact of 0.02 to 0.6 percent of revenues; up to 3 suppliers of industrial GHGs, representing up to a 0.85 percent increase in regulated businesses in this industry, will experience an impact of 0.02 to 0.14 percent of revenues; and that up to 27 industrial waste landfills (primarily co-

located with food processing facilities), representing up to a 7.3 percent increase in regulated businesses in this industry, will experience an impact of 0.01 to 0.48 percent of revenues.

Although this final rule will not have a significant economic impact on a substantial number of small entities, the EPA nonetheless has tried to reduce the impact of Part 98 on small entities. For example, the EPA conducted several meetings with industry associations to discuss regulatory options and the corresponding burden on industry, such as recordkeeping and reporting. The EPA continues to conduct significant outreach on Part 98 and maintains an "open door" policy for stakeholders to help inform the EPA's understanding of key issues for the industries.

D. Unfunded Mandates Reform Act (UMRA)

The final rule amendments and confidentiality determinations do not contain a federal mandate that may result in expenditures of \$100 million or more for state, local, and tribal governments, in the aggregate, or the private sector in any one year. Thus, the final rule amendments and confidentiality determinations are not subject to the requirements of section 202 and 205 of the UMRA.

This final rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. The final rule amends specific provisions in subpart A, General Provisions, to reflect global warming potentials that have been published by the IPCC. Also in this action, the EPA is revising specific provisions to provide clarity on what is to be reported. In some cases, the EPA has increased flexibility in the selection of methods used for calculating and monitoring GHGs. Therefore, this action is not subject to the requirements of section 203 of the UMRA.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132.

The final amendments and confidentiality determinations apply directly to facilities that directly emit greenhouse gases or that are suppliers of greenhouse gases. They do not apply to governmental entities unless the government entity owns a facility that

directly emits greenhouse gases above threshold levels (such as a landfill or large combustion device), so relatively few government facilities would be affected. Moreover, for government facilities that are subject to the rule, the final revisions will not have a significant cost impact. This regulation also does not limit the power of States or localities to collect GHG data and/or regulate GHG emissions. Thus, Executive Order 13132 does not apply to this action.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, the EPA specifically solicited comment on the proposed action from State and local officials. The EPA carefully considered the comments received in developing this final rule, including providing regulatory flexibility for certain municipally-owned solid waste landfills under subpart HH.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). The final amendments and confidentiality determinations apply directly to facilities that directly emit greenhouse gases or that are suppliers of greenhouse gases. They would not have tribal implications unless the tribal entity owns a facility that directly emits greenhouse gases above threshold levels (such as a landfill or large combustion device). Relatively few tribal facilities would be affected. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

The EPA interprets Executive Order 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the Executive Order has the potential to influence the regulation. This action is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant

regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113 (15 U.S.C. 272 note) directs the EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs the EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This final rule does not involve any new technical standards, but allows for greater flexibility for reporters to use consensus standards where they are available. Therefore, the EPA did not consider the use of specific voluntary consensus standards.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, (February 16, 1994) establishes Federal executive policy on environmental justice. Its main provision directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

The EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment because it is a rule addressing information collection and reporting procedures.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the

Congress and to the Comptroller General of the United States. The EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A Major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a “major rule” as defined by 5 U.S.C. 804(2). This rule will be effective on January 1, 2014.

List of Subjects 40 CFR Part 98

Environmental protection, Administrative practice and procedure, Greenhouse gases, Reporting and recordkeeping requirements.

Dated: November 15, 2013.

Gina McCarthy,
Administrator.

For the reasons stated in the preamble, title 40, chapter I, of the Code of Federal Regulations is amended as follows:

PART 98—MANDATORY GREENHOUSE GAS REPORTING

■ 1. The authority citation for part 98 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart A—[Amended]

- 2. Section 98.3 is amended by:
 - a. Revising paragraph (c)(1).
 - b. Adding paragraphs (c)(11)(viii) and (c)(13).
 - c. Revising paragraphs (h)(4) and (j)(3)(ii).
 - d. Adding paragraphs (k) and (l).

The revisions and additions read as follows:

§ 98.3 What are the general monitoring, reporting, recordkeeping and verification requirements of this part?

* * * * *

(c) * * *

(1) Facility name or supplier name (as appropriate), and physical street address of the facility or supplier, including the city, State, and zip code. If the facility does not have a physical street address, then the facility must provide the latitude and longitude representing the geographic centroid or center point of facility operations in decimal degree format. This must be provided in a comma-delimited “latitude, longitude” coordinate pair reported in decimal degrees to at least four digits to the right of the decimal point.

* * * * *

(11) * * *

(viii) The facility or supplier must refer to the reporting instructions of the

electronic GHG reporting tool regarding standardized conventions for the naming of a parent company.

* * * * *

(13) An indication of whether the facility includes one or more plant sites that have been assigned a "plant code" (as defined under § 98.6) by either the Department of Energy's Energy Information Administration or by the EPA's Clean Air Markets Division.

* * * * *

(h) * * *

(4) Notwithstanding paragraphs (h)(1) and (2) of this section, upon request by the owner or operator, the Administrator may provide reasonable extensions of the 45-day period for submission of the revised report or information under paragraphs (h)(1) and (2) of this section. If the Administrator receives a request for extension of the 45-day period, by email to an address prescribed by the Administrator prior to the expiration of the 45-day period, the extension request is deemed to be automatically granted for 30 days. The Administrator may grant an additional extension beyond the automatic 30-day extension if the owner or operator submits a request for an additional extension and the request is received by the Administrator at least 5 business days prior to the expiration of the automatic 30-day extension, provided the request demonstrates that it is not practicable to submit a revised report or information under paragraphs (h)(1) and (2) within 75 days. The Administrator will approve the extension request if the request demonstrates to the Administrator's satisfaction that it is not practicable to collect and process the data needed to resolve potential reporting errors identified pursuant to paragraphs (h)(1) or (2) of this section within 75 days.

* * * * *

(j) * * *

(3) * * *

(ii) Any subsequent extensions to the original request must be submitted to the Administrator within 4 weeks of the owner or operator identifying the need to extend the request, but in any event no later than 4 weeks before the date for the planned process equipment or unit shutdown that was provided in the original or most recently approved request.

* * * * *

(k) *Revised global warming potentials and special provisions for reporting year 2013.* This paragraph (k) applies to owners or operators of facilities or suppliers that first become subject to any subpart of part 98 solely due to an

amendment to Table A-1 of this subpart.

(1) A facility or supplier that was not subject to any subpart of part 98 for reporting year 2012, but first becomes subject to any subpart of part 98 due to a change in the GWP for one or more compounds in Table A-1 of this subpart, Global Warming Potentials, is not required to submit an annual GHG report for reporting year 2013.

(2) A facility or supplier that is subject to a subpart of part 98 for reporting year 2012, but first becomes subject to any subpart of part 98 due to a change in the GWP for one or more compounds in Table A-1 of this subpart, is not required to include those subparts for which the facility is subject only due to the change in the GWP in the annual GHG report submitted for reporting year 2013.

(3) Starting on January 1, 2014, facilities or suppliers identified in paragraphs (k)(1) or (2) of this section must start monitoring and collecting GHG data in compliance with the applicable subparts of part 98 for which the facility is subject due to the change in the GWP for the annual greenhouse gas report for reporting year 2014, which is due by March 31, 2015.

(l) *Special provision for best available monitoring methods in 2014.* This paragraph (l) applies to owners or operators of facilities or suppliers that first become subject to any subpart of part 98 due to an amendment to Table A-1 of this subpart, Global Warming Potentials.

(1) *Best available monitoring methods.* From January 1, 2014 to March 31, 2014, owners or operators subject to this paragraph (l) may use best available monitoring methods for any parameter (e.g., fuel use, feedstock rates) that cannot reasonably be measured according to the monitoring and QA/QC requirements of a relevant subpart. The owner or operator must use the calculation methodologies and equations in the "Calculating GHG Emissions" sections of each relevant subpart, but may use the best available monitoring method for any parameter for which it is not reasonably feasible to acquire, install, and operate a required piece of monitoring equipment by January 1, 2014. Starting no later than April 1, 2014, the owner or operator must discontinue using best available methods and begin following all applicable monitoring and QA/QC requirements of this part, except as provided in paragraph (l)(2) of this section. Best available monitoring methods means any of the following methods:

(i) Monitoring methods currently used by the facility that do not meet the specifications of a relevant subpart.

(ii) Supplier data.

(iii) Engineering calculations.

(iv) Other company records.

(2) *Requests for extension of the use of best available monitoring methods.*

The owner or operator may submit a request to the Administrator to use one or more best available monitoring methods beyond March 31, 2014.

(i) *Timing of request.* The extension request must be submitted to EPA no later than January 31, 2014.

(ii) *Content of request.* Requests must contain the following information:

(A) A list of specific items of monitoring instrumentation for which the request is being made and the locations where each piece of monitoring instrumentation will be installed.

(B) Identification of the specific rule requirements (by rule subpart, section, and paragraph numbers) for which the instrumentation is needed.

(C) A description of the reasons that the needed equipment could not be obtained and installed before April 1, 2014.

(D) If the reason for the extension is that the equipment cannot be purchased and delivered by April 1, 2014, supporting documentation such as the date the monitoring equipment was ordered, investigation of alternative suppliers and the dates by which alternative vendors promised delivery, backorder notices or unexpected delays, descriptions of actions taken to expedite delivery, and the current expected date of delivery.

(E) If the reason for the extension is that the equipment cannot be installed without a process unit shutdown, include supporting documentation demonstrating that it is not practicable to isolate the equipment and install the monitoring instrument without a full process unit shutdown. Include the date of the most recent process unit shutdown, the frequency of shutdowns for this process unit, and the date of the next planned shutdown during which the monitoring equipment can be installed. If there has been a shutdown or if there is a planned process unit shutdown between November 29, 2013 and April 1, 2014, include a justification of why the equipment could not be obtained and installed during that shutdown.

(F) A description of the specific actions the facility will take to obtain and install the equipment as soon as reasonably feasible and the expected date by which the equipment will be installed and operating.

(iii) Approval criteria. To obtain approval, the owner or operator must demonstrate to the Administrator's satisfaction that it is not reasonably feasible to acquire, install, and operate a required piece of monitoring equipment by April 1, 2014. The use of best available methods under this paragraph (l) will not be approved beyond December 31, 2014.

- 3. Section 98.6 is amended by:
 - a. Revising the definitions for "Continuous bleed", "Degasification system", and "Intermittent bleed pneumatic devices".
 - b. Adding the definition of "Plant code" in alphabetical order.
 - c. Revising the term "Ventilation well or shaft" to read "Ventilation hole or shaft" and revising the definition of the term.
 - d. Revising the definition of "Ventilation system".

The revisions and addition read as follows:

§ 98.6 Definitions.

* * * * *

Continuous bleed means a continuous flow of pneumatic supply natural gas to the process control device (e.g. level control, temperature control, pressure control) where the supply gas pressure is modulated by the process condition, and then flows to the valve controller

where the signal is compared with the process set-point to adjust gas pressure in the valve actuator.

* * * * *

Degasification system means the entirety of the equipment that is used to drain gas from underground coal mines. This includes all degasification wells and gob gas vent holes at the underground coal mine. Degasification systems include gob and premine surface drainage wells, gob and premine in-mine drainage wells, and in-mine gob and premine cross-measure borehole wells.

* * * * *

Intermittent bleed pneumatic devices mean automated flow control devices powered by pressurized natural gas and used for automatically maintaining a process condition such as liquid level, pressure, delta-pressure and temperature. These are snap-acting or throttling devices that discharge all or a portion of the full volume of the actuator intermittently when control action is necessary, but does not bleed continuously.

* * * * *

Plant code means either of the following:
 (1) The Plant ID code assigned by the Department of Energy's Energy Information Administration. The Energy

Information Administration Plant ID code is also referred to as the "ORIS code", "ORISPL code", "Facility ID", or "Facility code", among other names.

(2) If a Plant ID code has not been assigned by the Department of Energy's Energy Information Administration, then plant code means a code beginning with "88" assigned by the EPA's Clean Air Markets Division for electronic reporting.

* * * * *

Ventilation hole or shaft means a vent hole or shaft employed at an underground coal mine to serve as the outlet or conduit to move air from the ventilation system out of the mine.

Ventilation system means a system that is used to control the concentration of methane and other gases within mine working areas through mine ventilation, rather than a mine degasification system. A ventilation system consists of fans that move air through the mine workings to dilute methane concentrations.

* * * * *

§ 98.7 [Amended]

- 4. Section 98.7 is amended by removing and reserving paragraph (n).
- 5. Table A-1 to Subpart A is revised to read as follows:

TABLE A-1 TO SUBPART A OF PART 98—GLOBAL WARMING POTENTIALS [100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
Carbon dioxide	124-38-9	CO ₂	1
Methane	74-82-8	CH ₄	^a 25
Nitrous oxide	10024-97-2	N ₂ O	^a 298
HFC-23	75-46-7	CHF ₃	^a 14,800
HFC-32	75-10-5	CH ₂ F ₂	^a 675
HFC-41	593-53-3	CH ₃ F	^a 92
HFC-125	354-33-6	C ₂ HF ₅	^a 3,500
HFC-134	359-35-3	C ₂ H ₂ F ₄	^a 1,100
HFC-134a	811-97-2	CH ₂ FCF ₃	^a 1,430
HFC-143	430-66-0	C ₂ H ₃ F ₃	^a 353
HFC-143a	420-46-2	C ₂ H ₃ F ₃	^a 4,470
HFC-152	624-72-6	CH ₂ FCH ₂ F	53
HFC-152a	75-37-6	CH ₃ CHF ₂	^a 124
HFC-161	353-36-6	CH ₃ CH ₂ F	12
HFC-227ea	431-89-0	C ₃ HF ₇	^a 3,220
HFC-236cb	677-56-5	CH ₂ FCF ₂ CF ₃	1,340
HFC-236ea	431-63-0	CHF ₂ CHF ₂ CF ₃	1,370
HFC-236fa	690-39-1	C ₃ H ₂ F ₆	^a 9,810
HFC-245ca	679-86-7	C ₃ H ₃ F ₅	^a 693
HFC-245fa	460-73-1	CHF ₂ CH ₂ CF ₃	1,030
HFC-365mfc	406-58-6	CH ₃ CF ₂ CH ₂ CF ₃	794
HFC-43-10mee	138495-42-8	CF ₃ CFHCFHCF ₂ CF ₃	^a 1,640
Sulfur hexafluoride	2551-62-4	SF ₆	^a 22,800
Trifluoromethyl sulphur pentafluoride	373-80-8	SF ₅ CF ₃	17,700
Nitrogen trifluoride	7783-54-2	NF ₃	17,200
PFC-14 (Perfluoromethane)	75-73-0	CF ₄	^a 7,390
PFC-116 (Perfluoroethane)	76-16-4	C ₂ F ₆	^a 12,200
PFC-218 (Perfluoropropane)	76-19-7	C ₃ F ₈	^a 8,830
Perfluorocyclopropane	931-91-9	C-C ₃ F ₆	17,340
PFC-3-1-10 (Perfluorobutane)	355-25-9	C ₄ F ₁₀	^a 8,860

TABLE A-1 TO SUBPART A OF PART 98—GLOBAL WARMING POTENTIALS—Continued
[100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
PFC-318 (Perfluorocyclobutane)	115-25-3	C-C ₄ F ₈	^a 10,300
PFC-4-1-12 (Perfluoropentane)	678-26-2	C ₅ F ₁₂	^a 9,160
PFC-5-1-14 (Perfluorohexane, FC-72)	355-42-0	C ₆ F ₁₄	^a 9,300
PFC-9-1-18	306-94-5	C ₁₀ F ₁₈	7,500
HCFE-235da2 (Isoflurane)	26675-46-7	CHF ₂ OCHClCF ₃	350
HFE-43-10pccc (H-Galden 1040x, HG-11)	E1730133	CHF ₂ OCF ₂ OC ₂ F ₄ OCHF ₂	1,870
HFE-125	3822-68-2	CHF ₂ OCHF ₂	14,900
HFE-134 (HG-00)	1691-17-4	CHF ₂ OCHF ₂	6,320
HFE-143a	421-14-7	CH ₃ OCF ₃	756
HFE-227ea	2356-62-9	CF ₃ CHFOCF ₃	1,540
HFE-236ca12 (HG-10)	78522-47-1	CHF ₂ OCF ₂ OCHF ₂	2,800
HFE-236ea2 (Desflurane)	57041-67-5	CHF ₂ OCHF ₂ CF ₃	989
HFE-236fa	20193-67-3	CF ₃ CH ₂ OCF ₃	487
HFE-245cb2	22410-44-2	CH ₃ OCF ₂ CF ₃	708
HFE-245fa1	84011-15-4	CHF ₂ CH ₂ OCF ₃	286
HFE-245fa2	1885-48-9	CHF ₂ OCH ₂ CF ₃	659
HFE-254cb2	425-88-7	CH ₃ OCF ₂ CHF ₂	359
HFE-263fb2	460-43-5	CF ₃ CH ₂ OCH ₃	11
HFE-329mcc2	134769-21-4	CF ₃ CF ₂ OCF ₂ CHF ₂	919
HFE-338mcf2	156053-88-2	CF ₃ CF ₂ OCH ₂ CF ₃	552
HFE-338pcc13 (HG-01)	188690-78-0	CHF ₂ OCF ₂ CF ₂ OCHF ₂	1,500
HFE-347mcc3 (HFE-7000)	375-03-1	CH ₃ OCF ₂ CF ₂ CF ₃	575
HFE-347mcf2	171182-95-9	CF ₃ CF ₂ OCH ₂ CHF ₂	374
HFE-347pcf2	406-78-0	CHF ₂ CF ₂ OCH ₂ CF ₃	580
HFE-356mec3	382-34-3	CH ₃ OCF ₂ CHFCF ₃	101
HFE-356pcc3	160620-20-2	CH ₃ OCF ₂ CF ₂ CHF ₂	110
HFE-356pcf2	50807-77-7	CHF ₂ CH ₂ OCF ₂ CHF ₂	265
HFE-356pcf3	35042-99-0	CHF ₂ OCH ₂ CF ₂ CHF ₂	502
HFE-365mcf3	378-16-5	CF ₃ CF ₂ CH ₂ OCH ₃	11
HFE-374pc2	512-51-6	CH ₃ CH ₂ OCF ₂ CHF ₂	557
HFE-449s1 (HFE-7100)	163702-07-6	C ₄ F ₉ OCH ₃	297
Chemical blend	163702-08-7	(CF ₃) ₂ CF ₂ OCF ₂ OCH ₃	
HFE-569sf2 (HFE-7200)	163702-05-4	C ₄ F ₉ OC ₂ H ₅	59
Chemical blend	163702-06-5	(CF ₃) ₂ CF ₂ OC ₂ H ₅	
Sevoflurane (HFE-347mmz1)	28523-86-6	CH ₂ FOCH(CF ₃) ₂	345
HFE-356mm1	13171-18-1	(CF ₃) ₂ CHOCH ₃	27
HFE-338mmz1	26103-08-2	CHF ₂ OCH(CF ₃) ₂	380
(Octafluorotetramethyl-ene) hydroxymethyl group	NA	X-(CF ₂) ₄ CH(OH)-X	73
HFE-347mmy1	22052-84-2	CH ₃ OCF(CF ₃) ₂	343
Bis(trifluoromethyl)-methanol	920-66-1	(CF ₃) ₂ CHOH	195
2,2,3,3,3-pentafluoropropanol	422-05-9	CF ₃ CF ₂ CH ₂ OH	42
PFPME (HT-70)	NA	CF ₃ OCF(CF ₃)CF ₂ OCF ₂ OCF ₃	10,300

^a The GWP for this compound is different than the GWP in the version of Table A-1 to subpart A of part 98 published on October 30, 2009.

■ 6. Table A-6 is amended by removing 98.346(i)(5), 98.346(i)(7), and the entry for 98.466(c)(1) and revising 98.466(d)(3) to read as follows: the entries for 98.346(d)(1), 98.346(e),

TABLE A-6 TO SUBPART A OF PART 98—DATA ELEMENTS THAT ARE INPUTS TO EMISSION EQUATIONS AND FOR WHICH THE REPORTING DEADLINE IS MARCH 31, 2013

Subpart	Rule citation (40 CFR part 98)	Specific data elements for which reporting date is March 31, 2013 ("All" means all data elements in the cited paragraph are not required to be reported until March 31, 2013)
HH	98.346(d)(1)	Only degradable organic carbon (DOC) value, and fraction of DOC dissimilated (DOCF) values.
HH	98.346(e)	Only fraction of CH ₄ in landfill gas and methane correction factor (MCF) values.
HH	98.346(i)(5)	Only annual operating hours for the destruction devices located at the landfill facility, and the destruction efficiency for the destruction devices associated with that measurement location.

TABLE A-6 TO SUBPART A OF PART 98—DATA ELEMENTS THAT ARE INPUTS TO EMISSION EQUATIONS AND FOR WHICH THE REPORTING DEADLINE IS MARCH 31, 2013—Continued

Subpart	Rule citation (40 CFR part 98)	Specific data elements for which reporting date is March 31, 2013 ("All" means all data elements in the cited paragraph are not required to be reported until March 31, 2013)
HH	98.346(i)(7)	Only surface area specified in Table HH-3, estimated gas collection system efficiency, and annual operating hours of the gas collection system for each measurement locations.
TT	98.466(d)(3)	Only degradable organic carbon (DOCx) value for each waste stream used in calculations.

Table A-7 to Subpart A of Part 98 [Amended]

■ 7. Table A-7 is amended by removing the entries for 98.256(o)(6) and 98.256(o)(7).

Subpart C—[AMENDED]

■ 8. Section 98.33 is amended by adding paragraph (b)(1)(viii) and revising paragraphs (b)(3)(ii)(A) and (e)(1)(ii) to read as follows:

§ 98.33 Calculating GHG emissions.

(b) * * *
 (1) * * *
 (viii) May be used for the combustion of a fuel listed in Table C-1 if the fuel is combusted in a unit with a maximum rated heat input capacity greater than 250 mmBtu/hr (or, pursuant to § 98.36(c)(3), in a group of units served by a common supply pipe, having at least one unit with a maximum rated heat input capacity greater than 250 mmBtu/hr), provided that both of the following conditions apply:
 (A) The use of Tier 4 is not required.
 (B) The fuel provides less than 10 percent of the annual heat input to the unit, or if § 98.36(c)(3) applies, to the group of units served by a common supply pipe.

(3) * * *
 (ii) * * *
 (A) The use of Tier 1 or 2 is permitted, as described in paragraphs (b)(1)(iii), (b)(1)(v), (b)(1)(viii), and (b)(2)(ii) of this section.

(e) * * *
 (1) * * *
 (ii) The procedures in paragraph (e)(4) of this section.

■ 9. Section 98.36 is amended by:
 ■ a. Revising paragraph (b)(3).
 ■ b. Adding paragraphs (b)(11), (c)(1)(xi), (c)(2)(x), and (c)(2)(xi).
 ■ c. Revising the next to last sentence of paragraph (c)(3) introductory text.
 ■ d. Adding paragraphs (c)(3)(x), (d)(1)(x), (d)(2)(ii)(j), and (d)(2)(iii)(j).
 The revisions and additions read as follows:

§ 98.36 Data reporting requirements.

(b) * * *
 (3) Maximum rated heat input capacity of the unit, in mmBtu/hr.
 (11) If applicable, the plant code (as defined in § 98.6).
 (c) * * *
 (1) * * *
 (xi) If applicable, the plant code (as defined in § 98.6).

(2) * * *
 (x) Reserved.
 (xi) If applicable, the plant code (as defined in § 98.6).
 (3) * * * As a second example, in accordance with § 98.33(b)(1)(v), Tier 1 may be used regardless of unit size when natural gas is transported through the common pipe, if the annual fuel consumption is obtained from gas billing records in units of therms or mmBtu.
 (x) If applicable, the plant code (as defined in § 98.6).
 (d) * * *
 (1) * * *
 (x) If applicable, the plant code (as defined in § 98.6).
 (2) * * *
 (ii) * * *
 (j) If applicable, the plant code (as defined in § 98.6).
 (iii) * * *
 (j) If applicable, the plant code (as defined in § 98.6).
 ■ 10. Table C-1 to Subpart C is revised to read as follows:

TABLE C-1 TO SUBPART C—DEFAULT CO₂ EMISSION FACTORS AND HIGH HEAT VALUES FOR VARIOUS TYPES OF FUEL

Fuel type	Default high heat value	Default CO ₂ emission factor
Coal and coke	mmBtu/short ton	kg CO ₂ /mmBtu
Anthracite	25.09	103.69
Bituminous	24.93	93.28
Subbituminous	17.25	97.17
Lignite	14.21	97.72
Coal Coke	24.80	113.67
Mixed (Commercial sector)	21.39	94.27
Mixed (Industrial coking)	26.28	93.90
Mixed (Industrial sector)	22.35	94.67
Mixed (Electric Power sector)	19.73	95.52

TABLE C-1 TO SUBPART C—DEFAULT CO₂ EMISSION FACTORS AND HIGH HEAT VALUES FOR VARIOUS TYPES OF FUEL—Continued

Fuel type	Default high heat value	Default CO ₂ emission factor
Natural gas	mmBtu/scf	kg CO ₂ /mmBtu
(Weighted U.S. Average)	1.026×10^{-3}	53.06
Petroleum products	mmBtu/gallon	kg CO ₂ /mmBtu
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.138	74.00
Kerosene	0.135	75.20
Liquefied petroleum gases (LPG) ¹	0.092	61.71
Propane ¹	0.091	62.87
Propylene ²	0.091	67.77
Ethane ¹	0.068	59.60
Ethanol	0.084	68.44
Ethylene ²	0.058	65.96
Isobutane ¹	0.099	64.94
Isobutylene ¹	0.103	68.86
Butane ¹	0.103	64.77
Butylene ¹	0.105	68.72
Naphtha (<401 deg F)	0.125	68.02
Natural Gasoline	0.110	66.88
Other Oil (>401 deg F)	0.139	76.22
Pentanes Plus	0.110	70.02
Petrochemical Feedstocks	0.125	71.02
Petroleum Coke	0.143	102.41
Special Naphtha	0.125	72.34
Unfinished Oils	0.139	74.54
Heavy Gas Oils	0.148	74.92
Lubricants	0.144	74.27
Motor Gasoline	0.125	70.22
Aviation Gasoline	0.120	69.25
Kerosene-Type Jet Fuel	0.135	72.22
Asphalt and Road Oil	0.158	75.36
Crude Oil	0.138	74.54
Other fuels—solid	mmBtu/short ton	kg CO ₂ /mmBtu
Municipal Solid Waste	9.95 ³	90.7
Tires	28.00	85.97
Plastics	38.00	75.00
Petroleum Coke	30.00	102.41
Other fuels—gaseous	mmBtu/scf	kg CO ₂ /mmBtu
Blast Furnace Gas	0.092×10^{-3} ...	274.32
Coke Oven Gas	0.599×10^{-3} ...	46.85
Propane Gas	2.516×10^{-3} ...	61.46
Fuel Gas ⁴	1.388×10^{-3} ...	59.00
Biomass fuels—solid	mmBtu/short ton	kg CO ₂ /mmBtu
Wood and Wood Residuals (dry basis) ⁵	17.48	93.80
Agricultural Byproducts	8.25	118.17
Peat	8.00	111.84
Solid Byproducts	10.39	105.51

TABLE C-1 TO SUBPART C—DEFAULT CO₂ EMISSION FACTORS AND HIGH HEAT VALUES FOR VARIOUS TYPES OF FUEL—Continued

Fuel type	Default high heat value	Default CO ₂ emission factor
Biomass fuels—gaseous		
Landfill Gas	0.485 × 10 ⁻³ ...	52.07
Other Biomass Gases	0.655 × 10 ⁻³ ...	52.07
Biomass Fuels—Liquid		
Ethanol	0.084	68.44
Biodiesel (100%)	0.128	73.84
Rendered Animal Fat	0.125	71.06
Vegetable Oil	0.120	81.55

¹ The HHV for components of LPG determined at 60 °F and saturation pressure with the exception of ethylene.

² Ethylene HHV determined at 41 °F (5 °C) and saturation pressure.

³ Use of this default HHV is allowed only for: (a) Units that combust MSW, do not generate steam, and are allowed to use Tier 1; (b) units that derive no more than 10 percent of their annual heat input from MSW and/or tires; and (c) small batch incinerators that combust no more than 1,000 tons of MSW per year.

⁴ Reporters subject to subpart X of this part that are complying with § 98.243(d) or subpart Y of this part may only use the default HHV and the default CO₂ emission factor for fuel gas combustion under the conditions prescribed in § 98.243(d)(2)(i) and (d)(2)(ii) and § 98.252(a)(1) and (a)(2), respectively. Otherwise, reporters subject to subpart X or subpart Y shall use either Tier 3 (Equation C-5) or Tier 4.

⁵ Use the following formula to calculate a wet basis HHV for use in Equation C-1: $HHV_w = ((100 - M)/100) \cdot HHV_d$ where HHV_w = wet basis HHV, M = moisture content (percent) and HHV_d = dry basis HHV from Table C-1.

■ 11. Table C-2 to Subpart C is revised to read as follows:

TABLE C-2 TO SUBPART C—DEFAULT CH₄ AND N₂O EMISSION FACTORS FOR VARIOUS TYPES OF FUEL

Fuel type	Default CH ₄ emission factor (kg CH ₄ /mmBtu)	Default N ₂ O emission factor (kg N ₂ O/mmBtu)
Coal and Coke (All fuel types in Table C-1)	1.1 × 10 ⁻⁰²	1.6 × 10 ⁻⁰³
Natural Gas	1.0 × 10 ⁻⁰³	1.0 × 10 ⁻⁰⁴
Petroleum (All fuel types in Table C-1)	3.0 × 10 ⁻⁰³	6.0 × 10 ⁻⁰⁴
Fuel Gas	3.0 × 10 ⁻⁰³	6.0 × 10 ⁻⁰⁴
Municipal Solid Waste	3.2 × 10 ⁻⁰²	4.2 × 10 ⁻⁰³
Tires	3.2 × 10 ⁻⁰²	4.2 × 10 ⁻⁰³
Blast Furnace Gas	2.2 × 10 ⁻⁰⁵	1.0 × 10 ⁻⁰⁴
Coke Oven Gas	4.8 × 10 ⁻⁰⁴	1.0 × 10 ⁻⁰⁴
Biomass Fuels—Solid (All fuel types in Table C-1, except wood and wood residuals)	3.2 × 10 ⁻⁰²	4.2 × 10 ⁻⁰³
Wood and wood residuals	7.2 × 10 ⁻⁰³	3.6 × 10 ⁻⁰³
Biomass Fuels—Gaseous (All fuel types in Table C-1)	3.2 × 10 ⁻⁰³	6.3 × 10 ⁻⁰⁴
Biomass Fuels—Liquid (All fuel types in Table C-1)	1.1 × 10 ⁻⁰³	1.1 × 10 ⁻⁰⁴

Note: Those employing this table are assumed to fall under the IPCC definitions of the “Energy Industry” or “Manufacturing Industries and Construction”. In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC “Energy Industry” category may employ a value of 1g of CH₄/mmBtu.

Subpart E—[AMENDED]

■ 12. Section 98.53 is amended by:

- a. Revising paragraph (b)(3) and paragraph (d) introductory text.
- b. Revising paragraph (e) and Equation E-2 in paragraph (e).
- c. Revising the parameters “DF” and “AF” of Equation E-3a in paragraph (g)(1).
- d. Revising the parameters “DF₁”, “AF₁”, “DF₂”, “AF₂”, “DF_N”, and “AF_N” of Equation E-3b in paragraph (g)(2).

■ e. Revising the parameters “DF_N”, “AF_N”, and “FC_N” of Equation E-3c in paragraph (g)(3).

The revisions read as follows:

§ 98.53 Calculating GHG emissions.

* * * * *

(b) * * *

(3) You must measure the adipic acid production rate during the test and calculate the production rate for the test period in tons per hour.

* * * * *

(d) If the adipic acid production unit exhausts to any N₂O abatement

technology “N”, you must determine the destruction efficiency according to paragraphs (d)(1), (d)(2), or (d)(3) of this section.

* * * * *

(e) If the adipic acid production unit exhausts to any N₂O abatement technology “N”, you must determine the annual amount of adipic acid produced while N₂O abatement technology “N” is operating according to § 98.54(f). Then you must calculate the abatement factor for N₂O abatement technology “N” according to Equation E-2 of this section.

$$AF_N = \frac{P_{z,N}}{P_z}$$

(Eq. E-2)

* * * * *

(g) * * *
(1) * * *

* * * * *

DF = Destruction efficiency of N₂O abatement technology "N" (decimal fraction of N₂O removed from vent stream).

AF = Abatement utilization factor of N₂O abatement technology "N" (decimal fraction of time that the abatement technology is operating).

* * * * *

(2) * * *

* * * * *

DF₁ = Destruction efficiency of N₂O abatement technology 1 (decimal fraction of N₂O removed from vent stream).

AF₁ = Abatement utilization factor of N₂O abatement technology 1 (decimal fraction of time that abatement technology 1 is operating).

DF₂ = Destruction efficiency of N₂O abatement technology 2 (decimal fraction of N₂O removed from vent stream).

AF₂ = Abatement utilization factor of N₂O abatement technology 2 (decimal fraction of time that abatement technology 2 is operating).

DF_N = Destruction efficiency of N₂O abatement technology "N" (decimal fraction of N₂O removed from vent stream).

AF_N = Abatement utilization factor of N₂O abatement technology "N" (decimal

fraction of time that abatement technology N is operating).

* * * * *

(3) * * *

* * * * *

DF_N = Destruction efficiency of N₂O abatement technology "N" (decimal fraction of N₂O removed from vent stream).

AF_N = Abatement utilization factor of N₂O abatement technology "N" (decimal fraction of time that the abatement technology is operating).

FC_N = Fraction control factor of N₂O abatement technology "N" (decimal fraction of total emissions from unit "z" that are sent to abatement technology "N").

* * * * *

■ 13. Section 98.54 is amended by revising paragraphs (e) and (f) to read as follows:

§ 98.54 Monitoring and QA/QC requirements.

* * * * *

(e) You must determine the monthly amount of adipic acid produced. You must also determine the monthly amount of adipic acid produced during which N₂O abatement technology is operating. These monthly amounts are

determined according to the methods in paragraphs (c)(1) or (c)(2) of this section.

(f) You must determine the annual amount of adipic acid produced. You must also determine the annual amount of adipic acid produced during which N₂O abatement technology is operating. These are determined by summing the respective monthly adipic acid production quantities determined in paragraph (e) of this section.

Subpart G—[AMENDED]

- 14. Section 98.73 is amended by:
 - a. Revising paragraph (b)(4) introductory text and revising Equation G-4.
 - b. Revising Equation G-5 and by removing parameter "n" of Equation G-5 and adding in its place parameter "j".
 - c. Revising the parameter "E_{CO₂k}" of Equation G-5 in paragraph (b)(5).

The revisions read as follows:

§ 98.73 Calculating GHG emissions.

* * * * *

(b) * * *

(4) You must calculate the annual process CO₂ emissions from each ammonia processing unit k at your facility according to Equation G-4 of this section:

$$E_{CO_2,k} = CO_{2,G,k} + CO_{2,L,k} + CO_{2,S,k}$$

(Eq. G-4)

* * * * *

(5) * * *

$$CO_2 = \sum_{k=1}^j E_{CO_2,k}$$

(Eq. G-5)

* * * * *

E_{CO₂k} = Annual CO₂ emissions from each ammonia processing unit k (metric tons).

* * * * *

j = Total number of ammonia processing units.

* * * * *

■ 15. Section 98.75 is amended by revising paragraph (b) to read as follows:

§ 98.75 Procedures for estimating missing data.

* * * * *

(b) For missing feedstock supply rates used to determine monthly feedstock consumption, you must determine the best available estimate(s) of the parameter(s), based on all available process data.

■ 16. Section 98.76 is amended by revising paragraphs (a) introductory text, (b) introductory text, and (b)(13) to read as follows:

§ 98.76 Data reporting requirements.

* * * * *

(a) If a CEMS is used to measure CO₂ emissions, then you must report the relevant information required under § 98.36 for the Tier 4 Calculation Methodology and the information in paragraphs (a)(1) and (2) of this section:

(b) If a CEMS is not used to measure emissions, then you must report all of

the following information in this paragraph (b):

* * * * *

(13) Annual CO₂ emissions (metric tons) from the steam reforming of a hydrocarbon or the gasification of solid and liquid raw material at the ammonia manufacturing process unit used to produce urea and the method used to determine the CO₂ consumed in urea production.

Subpart H—[AMENDED]

■ 17. Section 98.86 is amended by revising paragraph (a)(2) to read as follows:

§ 98.86 Data reporting requirements.

* * * * *
 (a) * * *
 (2) Annual facility cement production.
 * * * * *

Subpart I—[AMENDED]

■ 18. Section 98.96 is amended by revising paragraph (y)(3)(i) to read as follows:

$$E_{CH_4} = \sum_i (M_{product_i} \times \frac{2}{2205} \times EF_{product_i})$$

* * * * *
 2/2205 = Conversion factor to convert kg CH₄/ton of product to metric tons CH₄.
 * * * * *

■ 20. Section 98.116 is amended by adding paragraph (e)(2) to read as follows:

§ 98.116 Data reporting requirements.

* * * * *
 (e) * * *
 (2) Annual process CH₄ emissions (in metric tons) from each EAF used for the production of any ferroalloy listed in Table K–1 of this subpart.
 * * * * *

Subpart L—[AMENDED]

■ 21. Section 98.126 is amended by revising paragraphs (j) introductory text, (j)(1), and (j)(3)(i) to read as follows:

§ 98.126 Data reporting requirements.

* * * * *
 (j) *Special provisions for reporting years 2011, 2012, and 2013 only.* For reporting years 2011, 2012, and 2013, the owner or operator of a facility must comply with paragraphs (j)(1), (j)(2), and (j)(3) of this section.

(1) *Timing.* The owner or operator of a facility is not required to report the data elements at § 98.3(c)(4)(iii) and paragraphs (a)(2), (a)(3), (a)(4), (a)(6), (b), (c), (d), (e), (f), (g), and (h) of this section until the later of March 31, 2015 or the date set forth for that data element at § 98.3(c)(4)(vii) and Table A–7 of Subpart A of this part.

(3) * * *

(i) If you choose to use a default GWP rather than your best estimate of the GWP for fluorinated GHGs whose GWPs are not listed in Table A–1 of Subpart A of this part, use a default GWP of 10,000 for fluorinated GHGs that are fully fluorinated GHGs and use a default

§ 98.96 Data reporting requirements.

* * * * *
 (y) * * *
 (3) * * *
 (i) The testing of tools to determine the potential effect on current utilization and by-product formation rates and destruction or removal efficiency values under the new conditions.
 * * * * *

GWP of 2000 for other fluorinated GHGs.
 * * * * *

Subpart N—[AMENDED]

■ 22. Section 98.143 is amended by:
 ■ a. Revising the introductory text.
 ■ b. Revising paragraph (b) introductory text.
 ■ c. Revising the parameters “MF_i” and “F_i” of Equation N–1 in paragraph (b)(2)(iv).
 The revisions read as follows:

§ 98.143 Calculating GHG emissions.

You must calculate and report the annual process CO₂ emissions from each continuous glass melting furnace using the procedure in paragraphs (a) through (c) of this section.

(b) For each continuous glass melting furnace that is not subject to the requirements in paragraph (a) of this section, calculate and report the process and combustion CO₂ emissions from the glass melting furnace by using either the procedure in paragraph (b)(1) of this section or the procedure in paragraph (b)(2) of this section, except as specified in paragraph (c) of this section.

(2) * * *
 (iv) * * *

MF_i = Annual average decimal mass fraction of carbonate-based mineral i in carbonate-based raw material i.
 * * * * *
 F_i = Decimal fraction of calcination achieved for carbonate-based raw material i, assumed to be equal to 1.0.
 * * * * *

■ 23. Section 98.144 is amended by revising paragraph (b) to read as follows:

§ 98.144 Monitoring and QA/QC requirements.

* * * * *

Subpart K—[AMENDED]

■ 19. Section 98.113 is amended by revising Equation K–3 and by removing the parameter “2000/2205” of Equation K–3 and adding in its place the parameter “2/2205” to read as follows:

§ 98.113 Calculating GHG emissions.

* * * * *
 (d) * * *
 (1) * * *

(Eq. K-3)

(b) You must measure carbonate-based mineral mass fractions at least annually to verify the mass fraction data provided by the supplier of the raw material; such measurements shall be based on sampling and chemical analysis using consensus standards that specify X-ray fluorescence. For measurements made in years prior to the emissions reporting year 2014, you may also use ASTM D3682–01 (Reapproved 2006) Standard Test Method for Major and Minor Elements in Combustion Residues from Coal Utilization Processes (incorporated by reference, *see* § 98.7) or ASTM D6349–09 Standard Test Method for Determination of Major and Minor Elements in Coal, Coke, and Solid Residues from Combustion of Coal and Coke by Inductively Coupled Plasma—Atomic Emission Spectrometry (incorporated by reference, *see* § 98.7).
 * * * * *

■ 24. Section 98.146 is amended by revising paragraphs (b)(4), (6), and (7) to read as follows:

§ 98.146 Data reporting requirements.

* * * * *
 (b) * * *
 (4) Carbonate-based mineral decimal mass fraction for each carbonate-based raw material charged to a continuous glass melting furnace.
 * * * * *
 (6) The decimal fraction of calcination achieved for each carbonate-based raw material, if a value other than 1.0 is used to calculate process mass emissions of CO₂.
 (7) Method used to determine decimal fraction of calcination.
 * * * * *

■ 25. Section 98.147 is amended by revising paragraph (b)(5) to read as follows:

§ 98.147 Records that must be retained.

* * * * *

(b) * * *
 (5) The decimal fraction of calcination achieved for each carbonate-based raw material, if a value other than 1.0 is used to calculate process mass emissions of CO₂.

* * * * *

Subpart O—[AMENDED]

- 26. Section 98.153 is amended by:
 - a. Revising paragraph (c) introductory text.
 - b. Revising paragraph (d) introductory text.
 - c. Revising the parameter “E_D” of Equation O–5 in paragraph (d).

The revisions read as follows:

§ 98.153 Calculating GHG emissions.

* * * * *

(c) For HCFC–22 production facilities that do not use a destruction device or that have a destruction device that is not directly connected to the HCFC–22 production equipment, HFC–23 emissions shall be estimated using Equation O–4 of this section:

* * * * *

(d) For HCFC–22 production facilities that use a destruction device connected to the HCFC–22 production equipment, HFC–23 emissions shall be estimated using Equation O–5 of this section:

* * * * *

E_D = Mass of HFC–23 emitted annually from destruction device (metric tons), calculated using Equation O–8 of this section.

* * * * *

- 27. Section 98.154 is amended by revising paragraph (j) to read as follows:

§ 98.154 Monitoring and QA/QC requirements.

* * * * *

(j) The number of sources of equipment type t with screening values less than 10,000 ppmv shall be the difference between the number of leak sources of equipment type t that could emit HFC–23 and the number of sources of equipment type t with screening values greater than or equal to 10,000 ppmv as determined under paragraph (i) of this section.

* * * * *

- 28. Section 98.156 is amended by revising paragraph (c) to read as follows:

§ 98.156 Data reporting requirements.

* * * * *

(c) Each HFC–23 destruction facility shall report the concentration (mass fraction) of HFC–23 measured at the outlet of the destruction device during the facility’s annual HFC–23 concentration measurements at the outlet of the device. If the concentration

of HFC–23 is below the detection limit of the measuring device, report the detection limit and that the concentration is below the detection limit.

* * * * *

Subpart P—[AMENDED]

- 29. Section 98.163 is amended by:
 - a. Revising paragraph (b) introductory text.

■ b. Revising the parameters “Fdst_n”, “CC_n”, and “MW_n” of Equation P–1 in paragraph (b)(1).

■ c. Revising the parameters “Fdst_n” and “CC_n” of Equation P–2 in paragraph (b)(2).

■ d. Revising the parameters “Fdst_n” and “CC_n” of Equation P–3 in paragraph (b)(3).

The revisions read as follows:

§ 98.163 Calculating GHG emissions.

* * * * *

(b) *Fuel and feedstock material balance approach.* Calculate and report CO₂ emissions as the sum of the annual emissions associated with each fuel and feedstock used for hydrogen production by following paragraphs (b)(1) through (3) of this section. The carbon content and molecular weight shall be obtained from the analyses conducted in accordance with § 98.164(b)(2), (b)(3), or (b)(4), as applicable, or from the missing data procedures in § 98.165. If the analyses are performed annually, then the annual value shall be used as the monthly average. If the analyses are performed more frequently than monthly, use the arithmetic average of values obtained during the month as the monthly average.

(1) * * *

* * * * *

Fdst_n = Volume or mass of the gaseous fuel or feedstock used in month n (scf (at standard conditions of 68 °F and atmospheric pressure) or kg of fuel or feedstock).

CC_n = Average carbon content of the gaseous fuel or feedstock for month n (kg carbon per kg of fuel or feedstock).

MW_n = Average molecular weight of the gaseous fuel or feedstock for month n (kg/kg-mole). If you measure mass, the term “MW_n/MVC” is replaced with “1”.

* * * * *

(2) * * *

* * * * *

Fdst_n = Volume or mass of the liquid fuel or feedstock used in month n (gallons or kg of fuel or feedstock).

CC_n = Average carbon content of the liquid fuel or feedstock, for month n (kg carbon per gallon or kg of fuel or feedstock).

* * * * *

(3) * * *

* * * * *

Fdst_n = Mass of solid fuel or feedstock used in month n (kg of fuel or feedstock).

CC_n = Average carbon content of the solid fuel or feedstock, for month n (kg carbon per kg of fuel or feedstock).

* * * * *

- 30. Section 98.164 is amended by:
 - a. Revising paragraphs (b)(3), (b)(4), and (b)(5) introductory text.
 - b. Removing paragraphs (c) and (d).
 The revisions read as follows:

§ 98.164 Monitoring and QA/QC requirements.

* * * * *

(b) * * *

(3) Determine the carbon content of fuel oil, naphtha, and other liquid fuels and feedstocks at least monthly, except annually for standard liquid hydrocarbon fuels and feedstocks having consistent composition, or upon delivery for liquid fuels and feedstocks delivered by bulk transport (e.g., by truck or rail).

(4) Determine the carbon content of coal, coke, and other solid fuels and feedstocks at least monthly, except annually for standard solid hydrocarbon fuels and feedstocks having consistent composition, or upon delivery for solid fuels and feedstocks delivered by bulk transport (e.g., by truck or rail).

(5) You must use the following applicable methods to determine the carbon content for all fuels and feedstocks, and molecular weight of gaseous fuels and feedstocks. Alternatively, you may use the results of chromatographic analysis of the fuel and feedstock, provided that the chromatograph is operated, maintained, and calibrated according to the manufacturer’s instructions; and the methods used for operation, maintenance, and calibration of the chromatograph are documented in the written monitoring plan for the unit under § 98.3(g)(5).

* * * * *

- 31. Section 98.166 is amended by revising paragraphs (a)(2), (a)(3), (b)(2), and (b)(5) to read as follows:

§ 98.166 Data reporting requirements.

* * * * *

(a) * * *

(2) Annual quantity of hydrogen produced (metric tons) for each process unit.

(3) Annual quantity of ammonia produced (metric tons), if applicable, for each process unit.

(b) * * *

(2) Monthly consumption of each fuel and feedstock used for hydrogen production and its type (scf or kg of gaseous fuels and feedstocks, gallons or

kg of liquid fuels and feedstocks, kg of solid fuels and feedstocks).

(5) Monthly analyses of carbon content for each fuel and feedstock used in hydrogen production (kg carbon/kg of gaseous and solid fuels and feedstocks, kg carbon per gallon or kg of liquid fuels and feedstocks).

■ 32. Section 98.167 is amended by adding paragraphs (c) and (d) to read as follows:

§ 98.167 Records that must be retained.

(c) For units using the calculation methodologies described in § 98.163(b), the records required under § 98.3(g) must include both the company records and a detailed explanation of how company records are used to estimate the following:

(1) Fuel and feedstock consumption, when solid fuel and feedstock is combusted and a CEMS is not used to measure GHG emissions.

(2) Fossil fuel consumption, when, pursuant to § 98.33(e), the owner or operator of a unit that uses CEMS to quantify CO₂ emissions and that combusts both fossil and biogenic fuels separately reports the biogenic portion of the total annual CO₂ emissions.

(3) Sorbent usage, if the methodology in § 98.33(d) is used to calculate CO₂ emissions from sorbent.

(d) The owner or operator must document the procedures used to ensure the accuracy of the estimates of fuel and feedstock usage and sorbent usage (as applicable) in § 98.163(b), including, but not limited to, calibration of weighing equipment, fuel and feedstock flow meters, and other measurement devices. The estimated accuracy of measurements made with these devices must also be recorded, and the technical basis for these estimates must be provided.

Subpart Q—[AMENDED]

■ 33. Section 98.170 is amended by revising the first sentence to read as follows:

§ 98.170 Definition of the source category.

The iron and steel production source category includes facilities with any of the following processes: taconite iron ore processing, integrated iron and steel manufacturing, cokemaking not collocated with an integrated iron and

steel manufacturing process, direct reduction furnaces not collocated with an integrated iron and steel manufacturing process, and electric arc furnace (EAF) steelmaking not collocated with an integrated iron and steel manufacturing process. * * *

■ 34. Section 98.173 is amended by:
 ■ a. Revising the parameters “(F_s)”, “(C_{sf})”, “(F_g)”, “(F_l)”, “(C_o)”, “(C_p)”, and “(C_R)” of Equation Q–1 in paragraph (b)(1)(i).

■ b. Revising the parameters “(C_{Iron})”, “(C_{Scrap})”, “(C_{Flux})”, “(C_{Carbon})”, “(C_{Steel})”, “(C_{Slag})”, and “(C_R)” of Equation Q–2 in paragraph (b)(1)(ii).

■ c. Revising the parameters “(C_{Coal})”, “(C_{Coke})”, and “(C_R)” of Equation Q–3 in paragraph (b)(1)(iii).

■ d. Revising the parameters “(F_g)”, “(C_{Feed})”, “(C_{Sinter})”, and “(C_R)” of Equation Q–4 in paragraph (b)(1)(iv).

■ e. Revising Equation Q–5 and the definitions in Equation Q–5 in paragraph (b)(1)(v).

■ f. Revising Equation Q–6 and revising the parameters “(C_{Steelin})”, “(C_{Steelout})”, and “(C_R)” of Equation Q–6 in paragraph (b)(1)(vi).

■ g. Revising the parameters “(F_g)”, “(C_{Ore})”, “(C_{Carbon})”, “(C_{Other})”, “(C_{Iron})”, “(C_{NM})”, and “(C_R)” of Equation Q–7 in paragraph (b)(1)(vii).

■ h. Revising paragraphs (c) and (d).
 The revisions read as follows:

§ 98.173 Calculating GHG emissions.

- (b) * * *
- (1) * * *
- (i) * * *

(F_s) = Annual mass of the solid fuel used (metric tons).

(C_{sf}) = Carbon content of the solid fuel, from the fuel analysis (expressed as a decimal fraction).

(F_g) = Annual volume of the gaseous fuel used (scf).

(F_l) = Annual volume of the liquid fuel used (gallons).

(C_o) = Carbon content of the greenball (taconite) pellets, from the carbon analysis results (expressed as a decimal fraction).

(C_p) = Carbon content of the fired pellets, from the carbon analysis results (expressed as a decimal fraction).

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(ii) * * *

(C_{Iron}) = Carbon content of the molten iron, from the carbon analysis results (expressed as a decimal fraction).

(C_{Scrap}) = Carbon content of the ferrous scrap, from the carbon analysis results (expressed as a decimal fraction).

(C_{Flux}) = Carbon content of the flux materials, from the carbon analysis results (expressed as a decimal fraction).

(C_{Carbon}) = Carbon content of the carbonaceous materials, from the carbon analysis results (expressed as a decimal fraction).

(C_{Steel}) = Carbon content of the steel, from the carbon analysis results (expressed as a decimal fraction).

(C_{Slag}) = Carbon content of the slag, from the carbon analysis (expressed as a decimal fraction).

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(iii) * * *

(C_{Coal}) = Carbon content of the coal, from the carbon analysis results (expressed as a decimal fraction).

(C_{Coke}) = Carbon content of the coke, from the carbon analysis results (expressed as a decimal fraction).

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(iv) * * *

(F_g) = Annual volume of the gaseous fuel used (scf).

(C_{Feed}) = Carbon content of the mixed sinter feed materials that form the bed entering the sintering machine, from the carbon analysis results (expressed as a decimal fraction).

(C_{Sinter}) = Carbon content of the sinter pellets, from the carbon analysis results (expressed as a decimal fraction).

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(v) For EAFs, estimate CO₂ emissions using Equation Q–5 of this section.

$$CO_2 = \frac{44}{12} * \left[(Iron) * (C_{Iron}) + (Scrap) * (C_{Scrap}) + (Flux) * (C_{Flux}) + (Electrode) * (C_{Electrode}) + (Carbon) * (C_{Carbon}) - (Steel) * (C_{Steel}) + (F_g) * (C_{gf}) * \frac{MW}{MVC} * 0.001 - (Slag) * (C_{Slag}) - (R) * (CR) \right]$$

(Eq. Q-5)

Where:

CO₂ = Annual CO₂ mass emissions from the EAF (metric tons).

44/12 = Ratio of molecular weights, CO₂ to carbon.

(Iron) = Annual mass of direct reduced iron (if any) charged to the furnace (metric tons).

(C_{Iron}) = Carbon content of the direct reduced iron, from the carbon analysis results (expressed as a decimal fraction).

(Scrap) = Annual mass of ferrous scrap charged to the furnace (metric tons).

(C_{Scrap}) = Carbon content of the ferrous scrap, from the carbon analysis results (expressed as a decimal fraction).

(Flux) = Annual mass of flux materials (e.g., limestone, dolomite) charged to the furnace (metric tons).

(C_{Flux}) = Carbon content of the flux materials, from the carbon analysis results (expressed as a decimal fraction).

(Electrode) = Annual mass of carbon electrode consumed (metric tons).

(C_{Electrode}) = Carbon content of the carbon electrode, from the carbon analysis results (expressed as a decimal fraction).

(Carbon) = Annual mass of carbonaceous materials (e.g., coal, coke) charged to the furnace (metric tons).

(C_{Carbon}) = Carbon content of the carbonaceous materials, from the carbon analysis results (expressed as a decimal fraction).

(Steel) = Annual mass of molten raw steel produced by the furnace (metric tons).

(C_{Steel}) = Carbon content of the steel, from the carbon analysis results (expressed as a decimal fraction).

(F_g) = Annual volume of the gaseous fuel used (scf at 60 degrees F and one atmosphere).

(C_{gf}) = Average carbon content of the gaseous fuel, from the fuel analysis results (kg C per kg of fuel).

(MW) = Molecular weight of the gaseous fuel (kg/kg-mole).

(MVC) = Molar volume conversion factor (836.6 scf per kg-mole at standard conditions of 60 degrees F and one atmosphere).

(0.001) = Conversion factor from kg to metric tons.

(Slag) = Annual mass of slag produced by the furnace (metric tons).

(C_{Slag}) = Carbon content of the slag, from the carbon analysis results (expressed as a decimal fraction).

(R) = Annual mass of air pollution control residue collected (metric tons).

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(vi) * * *

$$CO_2 = \frac{44}{12} * \{ (Steel) * [(C_{Steelin}) - (C_{Steelout})] - (R) * (C_R) \}$$

(Eq. Q-6)

* * * * *

(C_{Steelin}) = Carbon content of the molten steel before decarburization, from the carbon analysis results (expressed as a decimal fraction).

(C_{Steelout}) = Carbon content of the molten steel after decarburization, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

(vii) * * *

* * * * *

(F_g) = Annual volume of the gaseous fuel used (scf).

* * * * *

(C_{Ore}) = Carbon content of the iron ore or iron ore pellets, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Carbon}) = Carbon content of the carbonaceous materials, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Other}) = Average carbon content of the other materials charged to the furnace, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{Iron}) = Carbon content of the iron, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_{NM}) = Carbon content of the non-metallic materials, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(C_R) = Carbon content of the air pollution control residue, from the carbon analysis results (expressed as a decimal fraction).

* * * * *

(c) You must determine emissions of CO₂ from the coke pushing process in mtCO₂e by multiplying the metric tons of coal charged to the by-product recovery and non-recovery coke ovens during the reporting period by 0.008.

(d) If GHG emissions from a taconite indurating furnace, basic oxygen furnace, non-recovery coke oven battery, sinter process, EAF, decarburization vessel, or direct reduction furnace are vented through a stack equipped with a CEMS that complies with the Tier 4 methodology in subpart C of this part, or through the same stack as any combustion unit or process equipment that reports CO₂ emissions using a CEMS that complies with the Tier 4 Calculation Methodology in subpart C of this part (General Stationary Fuel Combustion Sources), then the

calculation methodology in paragraph (b) of this section shall not be used to calculate process emissions. The owner or operator shall report under this subpart the combined stack emissions according to the Tier 4 Calculation Methodology in § 98.33(a)(4) and comply with all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

■ 35. Section 98.174 is amended by adding a sentence to the end of paragraph (b)(1) and revising paragraph (c)(2) to read as follows:

§ 98.174 Monitoring and QA/QC requirements.

* * * * *

(b) * * *

(1) * * * No determination of the mass of steel output from decarburization vessels is required.

* * * * *

(c) * * *

(2)(i) For the exhaust from basic oxygen furnaces, EAFs, decarburization vessels, and direct reduction furnaces, sample the furnace exhaust for at least three complete production cycles that start when the furnace is being charged and end after steel or iron and slag have

been tapped. For EAFs that produce both carbon steel and stainless or specialty (low carbon) steel, develop an emission factor for the production of both types of steel.

(ii) For the exhaust from continuously charged EAFs, sample the exhaust for a period spanning at least three hours. For EAFs that produce both carbon steel and stainless or specialty (low carbon) steel, develop an emission factor for the production of both types of steel.

* * * * *

■ 36. Section 98.175 is amended by revising paragraph (a) to read as follows:

§ 98.175 Procedures for estimating missing data.

* * * * *

(a) Except as provided in § 98.174(b)(4), 100 percent data availability is required for the carbon content of inputs and outputs for facilities that estimate emissions using the carbon mass balance procedure in § 98.173(b)(1) or facilities that estimate emissions using the site-specific emission factor procedure in § 98.173(b)(2).

* * * * *

■ 37. Section 98.176 is amended by revising paragraph (e) introductory text to read as follows:

§ 98.176 Data reporting requirements.

* * * * *

(e) If you use the carbon mass balance method in § 98.173(b)(1) to determine CO₂ emissions, you must, except as provided in § 98.174(b)(4), report the following information for each process:

* * * * *

■ 38. Section 98.177 is amended by revising paragraph (b) to read as follows:

§ 98.177 Records that must be retained.

* * * * *

(b) When the carbon mass balance method is used to estimate emissions for a process, the monthly mass of each process input and output that are used to determine the annual mass, except that no determination of the mass of steel output from decarburization vessels is required.

* * * * *

Subpart S—[AMENDED]

■ 39. Section 98.190 is amended by revising paragraph (a) to read as follows:

§ 98.190 Definition of the source category.

(a) Lime manufacturing plants (LMPs) engage in the manufacture of a lime product by calcination of limestone, dolomite, shells or other calcareous

substances as defined in 40 CFR 63.7081(a)(1).

* * * * *

■ 40. Section 98.193 is amended by:

■ a. Revising paragraph (a).

■ b. Revising paragraph (b)(1).

■ c. Revising paragraph (b)(2) introductory text.

■ d. Revising paragraph (b)(2)(ii) introductory text.

■ e. Revising the parameters “EF_{LKD,i,n}”, “CaO_{LKD,i,n}” and “MgO_{LKD,i,n}” of Equation S–2 in paragraph (b)(2)(ii).

■ f. Revising paragraph (b)(2)(iii) introductory text.

■ g. Revising the parameters “E_{waste,i}”, “CaO_{waste,i}”, “MgO_{waste,i}”, and “M_{waste,i}” of Equation S–3 in paragraph (b)(2)(iii).

■ h. Revising paragraph (b)(2)(iv) introductory text.

■ i. Revising the parameters “E_{CO2}”, “EF_{LKD,i,n}”, “M_{LKD,i,n}”, “E_{waste,i}”, “b” and “z” of Equation S–4 in paragraph (b)(2)(iv).

The revisions read as follows:

§ 98.193 Calculating GHG emissions.

* * * * *

(a) If all lime kilns meet the conditions specified in § 98.33(b)(4)(ii) or (iii), you must calculate and report under this subpart the combined process and combustion CO₂ emissions from all lime kilns by operating and maintaining a CEMS to measure CO₂ emissions according to the Tier 4 Calculation Methodology specified in § 98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(b) * * *

(1) Calculate and report under this subpart the combined process and combustion CO₂ emissions from all lime kilns by operating and maintaining a CEMS to measure CO₂ emissions from all lime kilns according to the Tier 4 Calculation Methodology specified in § 98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(2) Calculate and report process and combustion CO₂ emissions from all lime kilns separately using the procedures specified in paragraphs (b)(2)(i) through (v) of this section.

* * * * *

(ii) You must calculate a monthly emission factor for each type of calcined byproduct or waste sold (including lime kiln dust) using Equation S–2 of this section:

* * * * *

EF_{LKD,i,n} = Emission factor for calcined lime byproduct or waste type i sold, for month n (metric tons CO₂/ton lime byproduct).

CaO_{LKD,i,n} = Calcium oxide content for calcined lime byproduct or waste type i sold, for month n (metric tons CaO/metric ton lime).

MgO_{LKD,i,n} = Magnesium oxide content for calcined lime byproduct or waste type i sold, for month n (metric tons MgO/metric ton lime).

* * * * *

(iii) You must calculate the annual CO₂ emissions from each type of calcined byproduct or waste that is not sold (including lime kiln dust and scrubber sludge) using Equation S–3 of this section:

* * * * *

E_{waste,i} = Annual CO₂ emissions for calcined lime byproduct or waste type i that is not sold (metric tons CO₂).

* * * * *

CaO_{waste,i} = Calcium oxide content for calcined lime byproduct or waste type i that is not sold (metric tons CaO/metric ton lime).

MgO_{waste,i} = Magnesium oxide content for calcined lime byproduct or waste type i that is not sold (metric tons MgO/metric ton lime).

M_{waste,i} = Annual weight or mass of calcined byproducts or wastes for lime type i that is not sold (tons).

* * * * *

(iv) You must calculate annual CO₂ process emissions for all lime kilns using Equation S–4 of this section:

* * * * *

E_{CO2} = Annual CO₂ process emissions from lime production from all lime kilns (metric tons/year).

* * * * *

EF_{LKD,i,n} = Emission factor of calcined byproducts or wastes sold for lime type i in calendar month n, (metric tons CO₂/ton byproduct or waste) from Equation S–2 of this section.

M_{LKD,i,n} = Monthly weight or mass of calcined byproducts or waste sold (such as lime kiln dust, LKD) for lime type i in calendar month n (tons).

E_{waste,i} = Annual CO₂ emissions for calcined lime byproduct or waste type i that is not sold (metric tons CO₂) from Equation S–3 of this section.

* * * * *

b = Number of calcined byproducts or wastes that are sold.

z = Number of calcined byproducts or wastes that are not sold.

* * * * *

■ 41. Section 98.194 is amended by revising paragraphs (a), (b), and (c) introductory text to read as follows:

§ 98.194 Monitoring and QA/QC requirements.

(a) You must determine the total quantity of each type of lime product that is produced and each calcined byproduct or waste (such as lime kiln dust) that is sold. The quantities of each should be directly measured monthly

with the same plant instruments used for accounting purposes, including but not limited to, calibrated weigh feeders, rail or truck scales, and barge measurements. The direct measurements of each lime product shall be reconciled annually with the difference in the beginning of and end of year inventories for these products, when measurements represent lime sold.

(b) You must determine the annual quantity of each calcined byproduct or waste generated that is not sold by either direct measurement using the same instruments identified in paragraph (a) of this section or by using a calcined byproduct or waste generation rate.

(c) You must determine the chemical composition (percent total CaO and percent total MgO) of each type of lime product that is produced and each type of calcined byproduct or waste sold according to paragraph (c)(1) or (2) of this section. You must determine the chemical composition of each type of lime product that is produced and each type of calcined byproduct or waste sold on a monthly basis. You must determine the chemical composition for each type of calcined byproduct or waste that is not sold on an annual basis.

* * * * *

■ 42. Section 98.195 is amended by revising paragraph (a) to read as follows:

§ 98.195 Procedures for estimating missing data.

* * * * *

(a) For each missing value of the quantity of lime produced (by lime type), and quantity of calcined byproduct or waste produced and sold, the substitute data value shall be the best available estimate based on all available process data or data used for accounting purposes.

* * * * *

■ 43. Section 98.196 is amended by revising paragraphs (a)(1), (a)(2), (a)(4), (a)(5), (a)(7), (b)(1) through (6), (b)(9) through (11), and (b)(14) to read as follows:

§ 98.196 Data reporting requirements.

* * * * *

(a) * * *

(1) Method used to determine the quantity of lime that is produced and quantity of lime that is sold.

(2) Method used to determine the quantity of calcined lime byproduct or waste sold.

* * * * *

(4) Beginning and end of year inventories for calcined lime byproducts or wastes sold, by type.

(5) Annual amount of calcined lime byproduct or waste sold, by type (tons).

* * * * *

(7) Annual amount of calcined lime byproduct or waste that is not sold, by type (tons).

* * * * *

(b) * * *

(1) Annual CO₂ process emissions from all lime kilns combined (metric tons).

(2) Monthly emission factors (metric ton CO₂/ton lime product) for each lime product type produced.

(3) Monthly emission factors for each calcined byproduct or waste by lime type that is sold.

(4) Standard method used (ASTM or NLA testing method) to determine chemical compositions of each lime type produced and each calcined lime byproduct or waste type.

(5) Monthly results of chemical composition analysis of each type of lime product produced and calcined byproduct or waste sold.

(6) Annual results of chemical composition analysis of each type of lime byproduct or waste that is not sold.

* * * * *

(9) Method used to determine the quantity of calcined lime byproduct or waste sold.

(10) Monthly amount of calcined lime byproduct or waste sold, by type (tons).

(11) Annual amount of calcined lime byproduct or waste that is not sold, by type (tons).

* * * * *

(14) Beginning and end of year inventories for calcined lime byproducts or wastes sold.

* * * * *

Subpart V—[AMENDED]

■ 44. Section 98.222 is amended by revising paragraph (a) to read as follows:

§ 98.222 GHGs to report.

(a) You must report N₂O process emissions from each nitric acid train as required by this subpart.

* * * * *

■ 45. Section 98.223 is amended by:

■ a. Revising paragraphs (b) introductory text, (b)(1), (b)(3), (d) introductory text, and (e) introductory text.

■ b. Removing the parameter “P_{a,N}” of Equation V–2 in paragraph (e) and adding in its place the parameter “P_{t,N}”.

■ c. Revising parameters “E_{N₂O,t}”, “P_t”, “DF”, and “AF” of Equation V–3a in paragraph (g)(1).

■ d. Revising paragraph (g)(2) introductory text.

■ e. Revising parameters “E_{N₂O,t}”, “EF_{N₂O,t}”, “P_t”, “DF₁”, “AF₁”, “DF₂”,

“AF₂”, “DF_N”, and “AF_N” of Equation V–3b in paragraph (g)(2).

■ f. Revising paragraph (g)(3) introductory text.

■ g. Revising parameters “E_{N₂O,t}”, “EF_{N₂O,t}”, “P_t”, “DF_N”, “AF_N”, and “FC_N” of Equation V–3c in paragraph (g)(3).

■ h. Revising parameter “E_{N₂O,t}” of Equation V–3d in paragraph (g)(4).

■ i. Revising paragraph (i).

The revisions read as follows:

§ 98.223 Calculating GHG emissions.

* * * * *

(b) You must conduct an annual performance test for each nitric acid train according to paragraphs (b)(1) through (3) of this section.

(1) You must conduct the performance test at the absorber tail gas vent, referred to as the test point, for each nitric acid train according to § 98.224(b) through (f). If multiple nitric acid trains exhaust to a common abatement technology and/or emission point, you must sample each process in the ducts before the emissions are combined, sample each process when only one process is operating, or sample the combined emissions when multiple processes are operating and base the site-specific emission factor on the combined production rate of the multiple nitric acid trains.

* * * * *

(3) You must measure the production rate during the performance test and calculate the production rate for the test period in tons (100 percent acid basis) per hour.

* * * * *

(d) If nitric acid train “t” exhausts to any N₂O abatement technology “N”, you must determine the destruction efficiency for each N₂O abatement technology “N” according to paragraphs (d)(1), (2), or (3) of this section.

* * * * *

(e) If nitric acid train “t” exhausts to any N₂O abatement technology “N”, you must determine the annual amount of nitric acid produced on nitric acid train “t” while N₂O abatement technology “N” is operating according to § 98.224(f). Then you must calculate the abatement utilization factor for each N₂O abatement technology “N” for each nitric acid train “t” according to Equation V–2 of this section.

* * * * *

P_{t,N} = Annual nitric acid production from nitric acid train “t” during which N₂O abatement technology “N” was operational (ton acid produced, 100 percent acid basis).

* * * * *

(g) * * *

(1) * * *
* * * * *

$E_{N_2O_t}$ = Annual N₂O mass emissions from nitric acid train “t” according to this Equation V-3a (metric tons).

* * * * *

P_t = Annual nitric acid production from nitric acid train “t” (ton acid produced, 100 percent acid basis).

DF = Destruction efficiency of N₂O abatement technology N that is used on nitric acid train “t” (decimal fraction of N₂O removed from vent stream).

AF = Abatement utilization factor of N₂O abatement technology “N” for nitric acid train “t” (decimal fraction of annual production during which abatement technology is operating).

* * * * *

(2) If multiple N₂O abatement technologies are located in series after your test point, you must use the emissions factor (determined in Equation V-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual nitric acid production (determined in paragraph (i) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation V-3b of this section:

* * * * *

$E_{N_2O_t}$ = Annual N₂O mass emissions from nitric acid train “t” according to this Equation V-3b (metric tons).

$EF_{N_2O,t}$ = N₂O emissions factor for nitric acid train “t” (lb N₂O/ton nitric acid produced).

P_t = Annual nitric acid produced from nitric acid train “t” (ton acid produced, 100 percent acid basis).

DF₁ = Destruction efficiency of N₂O abatement technology 1 (decimal fraction of N₂O removed from vent stream).

AF₁ = Abatement utilization factor of N₂O abatement technology 1 (decimal fraction of time that abatement technology 1 is operating).

DF₂ = Destruction efficiency of N₂O abatement technology 2 (decimal fraction of N₂O removed from vent stream).

AF₂ = Abatement utilization factor of N₂O abatement technology 2 (decimal fraction of time that abatement technology 2 is operating).

DF_N = Destruction efficiency of N₂O abatement technology N (decimal fraction of N₂O removed from vent stream).

AF_N = Abatement utilization factor of N₂O abatement technology N (decimal fraction of time that abatement technology N is operating).

* * * * *

(3) If multiple N₂O abatement technologies are located in parallel after your test point, you must use the emissions factor (determined in Equation V-1 of this section), the destruction efficiency (determined in

paragraph (d) of this section), the annual nitric acid production (determined in paragraph (i) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation V-3c of this section:

* * * * *

$E_{N_2O_t}$ = Annual N₂O mass emissions from nitric acid train “t” according to this Equation V-3c (metric tons).

$EF_{N_2O,t}$ = N₂O emissions factor for nitric acid train “t” (lb N₂O/ton nitric acid produced).

P_t = Annual nitric acid produced from nitric acid train “t” (ton acid produced, 100 percent acid basis).

DF_N = Destruction efficiency of N₂O abatement technology “N” (decimal fraction of N₂O removed from vent stream).

AF_N = Abatement utilization factor of N₂O abatement technology “N” (decimal fraction of time that abatement technology “N” is operating).

FC_N = Fraction control factor of N₂O abatement technology “N” (decimal fraction of total emissions from nitric acid train “t” that are sent to abatement technology “N”).

* * * * *

(4) * * *

* * * * *

$E_{N_2O_t}$ = Annual N₂O mass emissions from nitric acid train “t” according to this Equation V-3d (metric tons).

* * * * *

(i) You must determine the total annual amount of nitric acid produced on each nitric acid train “t” (tons acid produced, 100 percent acid basis), according to § 98.224(f).

■ 46. Section 98.224 is amended by revising paragraphs (c) introductory text, (e), and (f) to read as follows:

§ 98.224 Monitoring and QA/QC requirements.

* * * * *

(c) You must determine the production rate(s) (100 percent acid basis) from each nitric acid train during the performance test according to paragraphs (c)(1) or (2) of this section.

* * * * *

(e) You must determine the total monthly amount of nitric acid produced. You must also determine the monthly amount of nitric acid produced while N₂O abatement technology is operating from each nitric acid train. These monthly amounts are determined according to the methods in paragraphs (c)(1) or (2) of this section.

(f) You must determine the annual amount of nitric acid produced. You must also determine the annual amount of nitric acid produced while N₂O

abatement technology is operating for each nitric acid train. These annual amounts are determined by summing the respective monthly nitric acid quantities determined in paragraph (e) of this section.

■ 47. Section 98.226 is amended by:

■ a. Revising paragraph (a).

■ b. Adding reserved paragraph (o).

■ c. Revising paragraph (p).

The revisions and addition read as follows:

§ 98.226 Data reporting requirements.

* * * * *

(a) Nitric Acid train identification number.

* * * * *

(p) Fraction control factor for each abatement technology (percent of total emissions from the nitric acid train that are sent to the abatement technology) if Equation V-3c is used.

Subpart W—[Amended]

■ 48. Section 98.233 is amended by:

■ a. Revising parameter “Conv_i” of Equation W-1 in paragraph (a).

■ b. Revising parameter “Conv_i” of Equation W-2 in paragraph (c).

■ c. Revising parameter “GWP” of Equation W-36 in paragraph (v).

The revisions read as follows:

§ 98.233 Calculating GHG emissions.

* * * * *

(a) * * *

Conv_i = Conversion from standard cubic feet to metric tons CO₂e; 0.000479 for CH₄, and 0.00005262 for CO₂.

* * * * *

(c) * * *

Conv_i = Conversion from standard cubic feet to metric tons CO₂e; 0.000479 for CH₄, and 0.00005262 for CO₂.

* * * * *

(v) * * *

GWP = Global warming potential, 1 for CO₂, 25 for CH₄, and 298 for N₂O.

* * * * *

Subpart X—[AMENDED]

■ 49. Section 98.242 is amended by revising paragraph (b)(2) to read as follows:

§ 98.242 GHGs to report.

* * * * *

(b) * * *

(2) If you comply with § 98.243(c), report CO₂, CH₄, and N₂O combustion emissions under subpart C of this part (General Stationary Fuel Combustion Sources) by following the requirements of subpart C for all fuels, except

emissions from burning petrochemical process off-gas in any combustion unit, including units that are not part of the petrochemical process unit, are not to be reported under subpart C of this part. Determine the applicable Tier in subpart C of this part (General Stationary Fuel Combustion Sources) based on the maximum rated heat input capacity of the stationary combustion source.

* * * * *

■ 50. Section 98.243 is amended by:

- a. Revising paragraph (b).
- b. Revising paragraphs (c)(3) and (4).
- c. Revising the equation terms “ C_g ”, “ $(F_{gf})_{i,n}$ ”, and “ $(P_{gp})_{i,n}$ ” of Equation X–1 in paragraph (c)(5)(i).
- d. Removing the equation term “ $(MW_f)_i$ ” of Equation X–1 and adding in its place the parameter “ $(MW_f)_{i,n}$ ” and defining the new parameter in the equation terms.
- e. Removing the equation term “ $(MW_p)_i$ ” of Equation X–1 and adding in its place the parameter “ $(MW_p)_{i,n}$ ” and defining the new parameter in the equation terms.
- f. Revising paragraph (d)(3)(i).

The revisions read as follows:

§ 98.243 Calculating GHG emissions.

* * * * *

(b) *Continuous emission monitoring system (CEMS)*. Route all process vent emissions and emissions from stationary combustion units that burn any amount of process off-gas to one or more stacks

and determine GHG emissions as specified in paragraphs (b)(1) through (3) of this section.

(1) Determine CO₂ emissions from each stack (except flare stacks) according to the Tier 4 Calculation Methodology requirements in subpart C of this part.

(2) For each stack (except flare stacks) that includes emissions from combustion of petrochemical process off-gas, calculate CH₄ and N₂O emissions in accordance with subpart C of this part (use Equation C–10 and the “fuel gas” emission factors in Table C–2 of subpart C of this part).

(3) For each flare, calculate CO₂, CH₄, and N₂O emissions using the methodology specified in § 98.253(b)(1) through (3).

(c) * * *

(3) Collect a sample of each feedstock and product at least once per month and determine the carbon content of each sample according to the procedures of § 98.244(b)(4). If multiple valid carbon content measurements are made during the monthly measurement period, average them arithmetically. However, if a particular liquid or solid feedstock is delivered in lots, and if multiple deliveries of the same feedstock are received from the same supply source in a given calendar month, only one representative sample is required.

Alternatively, you may use the results of analyses conducted by a feedstock

supplier, or product customer, provided the sampling and analysis is conducted at least once per month using any of the procedures specified in § 98.244(b)(4).

(4) If you determine that the monthly average concentration of a specific compound in a feedstock or product is greater than 99.5 percent by volume or mass, then as an alternative to the sampling and analysis specified in paragraph (c)(3) of this section, you may determine carbon content in accordance with paragraphs (c)(4)(i) through (iii) of this section.

(i) Calculate the carbon content assuming 100 percent of that feedstock or product is the specific compound.

(ii) Maintain records of any determination made in accordance with this paragraph (c)(4) along with all supporting data, calculations, and other information.

(iii) Reevaluate determinations made under this paragraph (c)(4) after any process change that affects the feedstock or product composition. Keep records of the process change and the corresponding composition determinations. If the feedstock or product composition changes so that the average monthly concentration falls below 99.5 percent, you are no longer permitted to use this alternative method.

(5) * * *

(i) * * *

$$C_g = \sum_{n=1}^{12} \left[\sum_{i=1}^{jork} \left((F_{gf})_{i,n} * (CC_{gf})_{i,n} * \frac{(MW_f)_{i,n}}{MVC} - (P_{gp})_{i,n} * (CC_{gp})_{i,n} * \frac{(MW_p)_{i,n}}{MVC} \right) \right] \text{ (Eq. X-1)}$$

* * * * *

C_g = Annual net contribution to calculated emissions from carbon (C) in gaseous materials, including streams containing CO₂ recovered for sale or use in another process (kg/yr).

$(F_{gf})_{i,n}$ = Volume or mass of gaseous feedstock i introduced in month “n” (scf or kg). If you measure mass, the term $(MW_f)_{i,n}/MVC$ is replaced with “1”.

* * * * *

$(MW_f)_{i,n}$ = Molecular weight of gaseous feedstock i in month “n” (kg/kg-mole).

* * * * *

$(P_{gp})_{i,n}$ = Volume or mass of gaseous product i produced in month “n” (scf or kg). If you measure mass, the term $(MW_p)_{i,n}/MVC$ is replaced with “1”.

* * * * *

$(MW_p)_{i,n}$ = Molecular weight of gaseous product i in month “n” (kg/kg-mole).

* * * * *

(d) * * *

(3) * * *

(i) For all gaseous fuels that contain ethylene process off-gas, use the emission factors for “Fuel Gas” in Table C–2 of subpart C of this part (General Stationary Fuel Combustion Sources).

* * * * *

■ 51. Section 98.244 is amended by:

- a. Revising paragraph (b)(4) introductory text, and paragraphs (b)(4)(xiii), (b)(4)(xiv), and (b)(4)(xv)(A).
- b. Adding paragraph (c).

The revisions and addition read as follows:

§ 98.244 Monitoring and QA/QC requirements.

* * * * *

(b) * * *

(4) Beginning January 1, 2010, use any applicable methods specified in paragraphs (b)(4)(i) through (xv) of this section to determine the carbon content or composition of feedstocks and

products and the average molecular weight of gaseous feedstocks and products. Calibrate instruments in accordance with paragraphs (b)(4)(i) through (xv) of this section, as applicable. For coal used as a feedstock, the samples for carbon content determinations shall be taken at a location that is representative of the coal feedstock used during the corresponding monthly period. For carbon black products, samples shall be taken of each grade or type of product produced during the monthly period. Samples of coal feedstock or carbon black product for carbon content determinations may be either grab samples collected and analyzed monthly or a composite of samples collected more frequently and analyzed monthly. Analyses conducted in accordance with methods specified in paragraphs (b)(4)(i) through (xv) of this

section may be performed by the owner or operator, by an independent laboratory, by the supplier of a feedstock, or by a product customer.

* * * * *

(xiii) The results of chromatographic analysis of a feedstock or product, provided that the chromatograph is operated, maintained, and calibrated according to the manufacturer's instructions.

(xiv) The results of mass spectrometer analysis of a feedstock or product, provided that the mass spectrometer is operated, maintained, and calibrated according to the manufacturer's instructions.

(xv) * * *

(A) An industry standard practice or a method published by a consensus-based standards organization if such a method exists for carbon black feedstock oils and carbon black products. Consensus-based standards organizations include, but are not limited to, the following: ASTM International (100 Barr Harbor Drive, P.O. Box CB700, West Conshohocken, Pennsylvania 19428-B2959, (800) 262-1373, <http://www.astm.org>), the American National Standards Institute (ANSI, 1819 L Street, NW., 6th floor, Washington, DC 20036, (202) 293-8020, <http://www.ansi.org>), the American Gas Association (AGA, 400 North Capitol Street NW., 4th Floor, Washington, DC 20001, (202) 824-7000, <http://www.aga.org>), the American Society of Mechanical Engineers (ASME, Three Park Avenue, New York, NY 10016-5990, (800) 843-2763, <http://www.asme.org>), the American Petroleum Institute (API, 1220 L Street NW., Washington, DC 20005-4070, (202) 682-8000, <http://www.api.org>), and the North American Energy Standards Board (NAESB, 801 Travis Street, Suite 1675, Houston, TX 77002, (713) 356-0060, <http://www.naesb.org>). The method(s) used shall be documented in the monitoring plan required under § 98.3(g)(5).

* * * * *

(c) If you comply with § 98.243(b) or (d), conduct monitoring and QA/QC for flares in accordance with § 98.254(b) through (e) for each flare gas flow meter, gas composition meter, and/or heating value monitor that you use to comply with § 98.253(b)(1) through (b)(3). You must implement all applicable QA/QC requirements specified in this paragraph (c) beginning no later than January 1, 2015.

■ 52. Section 98.245 is revised to read as follows:

§ 98.245 Procedures for estimating missing data.

For missing feedstock and product flow rates, use the same procedures as for missing fuel usage as specified in § 98.35(b)(2). For missing feedstock and product carbon contents and missing molecular weights for gaseous feedstocks and products, use the same procedures as for missing carbon contents and missing molecular weights for fuels as specified in § 98.35(b)(1).

For missing flare data, follow the procedures in § 98.255(b) and (c).

- 53. Section 98.246 is amended by:
 - a. Revising paragraphs (a)(6), (a)(8), (a)(9), (a)(11) introductory text, (a)(11)(iii), and (b)(2) through (5).
 - b. Removing and reserving paragraph (b)(6).
 - c. Revising paragraph (c)(4).

The revisions read as follows:

§ 98.246 Data reporting requirements.

* * * * *

(a) * * *

(6) For each feedstock and product, provide the information specified in paragraphs (a)(6)(i) through (a)(6)(iii) of this section.

(i) Name of each method used to determine carbon content or molecular weight in accordance with § 98.244(b)(4);

(ii) Description of each type of device (e.g., flow meter, weighing device) used to determine flow or mass in accordance with § 98.244(b)(1) through (3).

(iii) Identification of each method (i.e., method number, title, or other description) used to determine flow or mass in accordance with § 98.244(b)(1) through (3).

* * * * *

(8) Identification of each combustion unit that burned both process off-gas and supplemental fuel, including combustion units that are not part of the petrochemical process unit.

(9) The number of days during which off-specification product was produced if the alternative to sampling and analysis specified in § 98.243(c)(4) is used for a product, and, if applicable, the date of any process change that reduced the monthly average composition to less than 99.5 percent for each product or feedstock for which you comply with the alternative to sampling and analysis specified in § 98.243(c)(4).

* * * * *

(11) If you determine carbon content or composition of a feedstock or product using a method under § 98.244(b)(4)(xv)(B), report the information listed in paragraphs (a)(11)(i) through (a)(11)(iii) of this

section. Include the information in paragraph (a)(11)(i) of this section in each annual report. Include the information in paragraphs (a)(11)(ii) and (a)(11)(iii) of this section only in the first applicable annual report, and provide any changes to this information in subsequent annual reports.

* * * * *

(iii) An explanation of why an alternative to the methods listed in §§ 98.244(b)(4)(i) through (xiv) is needed.

(b) * * *

(2) For CEMS used on stacks that include emissions from stationary combustion units that burn any amount of off-gas from the petrochemical process, report the relevant information required under § 98.36(c)(2) and (e)(2)(vi) for the Tier 4 calculation methodology. Sections 98.36(c)(2)(ii) and (c)(2)(ix) do not apply for the purposes of this subpart.

(3) For CEMS used on stacks that do not include emissions from stationary combustion units, report the information required under § 98.36(b)(6), (b)(7), and (e)(2)(vi).

(4) For each CEMS monitoring location that meets the conditions in paragraph (b)(2) or (3) of this section, provide an estimate based on engineering judgment of the fraction of the total CO₂ emissions that results from CO₂ directly emitted by the petrochemical process unit plus CO₂ generated by the combustion of off-gas from the petrochemical process unit.

(5) For each CEMS monitoring location that meets the conditions in paragraph (b)(2) of this section, report the CH₄ and N₂O emissions expressed in metric tons of each gas. For each CEMS monitoring location, provide an estimate based on engineering judgment of the fraction of the total CH₄ and N₂O emissions that is attributable to combustion of off-gas from the petrochemical process unit.

* * * * *

(c) * * *

(4) Name and annual quantity of each feedstock (metric tons).

* * * * *

■ 54. Section 98.247 is amended by revising paragraphs (b) introductory text, (b)(2), and (b)(3) to read as follows:

§ 98.247 Records that must be retained.

* * * * *

(b) If you comply with the mass balance methodology in § 98.243(c), then you must retain records of the information listed in paragraphs (b)(1) through (4) of this section.

* * * * *

(2) Start and end times for time periods when off-specification product is produced, if you comply with the alternative methodology in § 98.243(c)(4) for determining carbon content of product.

(3) As part of the monitoring plan required under § 98.3(g)(5), record the estimated accuracy of measurement devices and the technical basis for these estimates.

* * * * *

■ 55. Section 98.248 is amended by revising the definition of “Product” to read as follows:

§ 98.248 Definitions.

* * * * *

Product, as used in § 98.243, means each of the following carbon-containing outputs from a process: the petrochemical, recovered byproducts, and liquid organic wastes that are not combusted onsite. Product does not include process vent emissions, fugitive emissions, or wastewater.

Subpart Y—[AMENDED]

■ 56. Section 98.252 is amended by revising the parenthetical phrase preceding the last two sentences in paragraph (a) introductory text and revising paragraph (i) to read as follows:

§ 98.252 GHGs to report.

* * * * *

(a) * * * (Use the default CH₄ and N₂O emission factors for “Fuel Gas” in Table C–2 of this part. For Tier 3, use either the default high heat value for fuel gas in Table C–1 of subpart C of this part or a calculated HHV, as allowed in Equation C–8 of subpart C of this part.)

* * * * *

(i) CO₂ emissions from non-merchant hydrogen production process units (not including hydrogen produced from catalytic reforming units) following the calculation methodologies, monitoring and QA/QC methods, missing data procedures, reporting requirements, and recordkeeping requirements of subpart P of this part.

■ 57. Section 98.253 is amended by:

■ a. Revising the parameter “EmF_{CH₄}” to Equation Y–4 in paragraph (b)(2) and “EmF_{N₂O}” to Equation Y–5 in paragraph (b)(3).

■ b. Revising paragraphs (f)(2) and (3).

■ c. Revising paragraph (f)(4) introductory text and the parameters “F_{SG}” and “MF_c” to Equation Y–12.

■ d. Revising paragraphs (j) introductory text, (k) introductory text, and (m) introductory text.

The revisions read as follows:

§ 98.253 Calculating GHG emissions.

* * * * *

(b) * * *

(2) * * *

* * * * *

EmF_{CH₄} = Default CH₄ emission factor for “Fuel Gas” from Table C–2 of subpart C of this part (General Stationary Fuel Combustion Sources) (kg CH₄/MMBtu).

* * * * *

(3) * * *

* * * * *

EmF_{N₂O} = Default N₂O emission factor for “Fuel Gas” from Table C–2 of subpart C of this part (General Stationary Fuel Combustion Sources) (kg N₂O/MMBtu).

* * * * *

(f) * * *

(2) Flow measurement. If you have a continuous flow monitor on the sour gas feed to the sulfur recovery plant or the sour gas feed sent for off-site sulfur recovery, you must use the measured flow rates when the monitor is operational to calculate the sour gas flow rate. If you do not have a continuous flow monitor on the sour gas feed to the sulfur recovery plant or the sour gas feed sent for off-site sulfur recovery, you must use engineering calculations, company records, or similar estimates of volumetric sour gas flow.

(3) Carbon content. If you have a continuous gas composition monitor capable of measuring carbon content on the sour gas feed to the sulfur recovery plant or the sour gas feed sent for off-site for sulfur recovery, or if you monitor gas composition for carbon content on a routine basis, you must use the measured carbon content value. Alternatively, you may develop a site-specific carbon content factor using limited measurement data or engineering estimates or use the default factor of 0.20.

(4) Calculate the CO₂ emissions from each on-site sulfur recovery plant and for sour gas sent off-site for sulfur recovery using Equation Y–12 of this section.

* * * * *

F_{SG} = Volumetric flow rate of sour gas (including sour water stripper gas) fed to the sulfur recovery plant or the sour gas feed sent off-site for sulfur recovery (scf/year).

* * * * *

MF_c = Mole fraction of carbon in the sour gas fed to the sulfur recovery plant or the sour gas feed sent off-site for sulfur recovery (kg-mole C/kg-mole gas); default = 0.20.

* * * * *

(j) For each process vent not covered in paragraphs (a) through (i) of this section that can reasonably be expected to contain greater than 2 percent by volume CO₂ or greater than 0.5 percent by volume of CH₄ or greater than 0.01 percent by volume (100 parts per million) of N₂O, calculate GHG emissions using Equation Y–19 of this section. You must also use Equation Y–19 of this section to calculate CH₄ emissions for catalytic reforming unit depressurization and purge vents when methane is used as the purge gas. CH₄ emissions if you elected to use the method in paragraph (i)(1) of this section, and CO₂ and/or CH₄ emissions, as applicable, if you elected this method as an alternative to the methods in paragraphs (f), (h), or (k) of this section.

* * * * *

(k) For uncontrolled blowdown systems, you must calculate CH₄ emissions either using the methods for process vents in paragraph (j) of this section regardless of the CH₄ concentration or using Equation Y–20 of this section. Blowdown systems where the uncondensed gas stream is routed to a flare or similar control device are considered to be controlled and are not required to estimate emissions under this paragraph (k).

* * * * *

(m) For storage tanks, except as provided in paragraph (m)(3) of this section, calculate CH₄ emissions using the applicable methods in paragraphs (m)(1) and (2) of this section.

* * * * *

- 58. Section 98.256 is amended by:
- a. Revising paragraphs (f)(6), (h) introductory text, and (h)(2) through (6).
- b. Adding paragraph (j)(10).
- c. Revising paragraph (k)(4).
- d. Adding paragraph (k)(6).
- e. Revising paragraph (o)(4)(vi).
- f. Removing and reserving paragraphs (o)(5) through (7).

The revisions and additions read as follows:

§ 98.256 Data reporting requirements.

* * * * *

(f) * * *

(6) If you use a CEMS, the relevant information required under § 98.36 for the Tier 4 Calculation Methodology, the CO₂ annual emissions as measured by the CEMS (unadjusted to remove CO₂ combustion emissions associated with additional units, if present) and the process CO₂ emissions as calculated according to § 98.253(c)(1)(ii). Report the CO₂ annual emissions associated with sources other than those from the coke burn-off in accordance with the

applicable subpart (e.g., subpart C of this part in the case of a CO boiler).

* * * * *

(h) For on-site sulfur recovery plants and for emissions from sour gas sent off-site for sulfur recovery, the owner and operator shall report:

* * * * *

(2) For each on-site sulfur recovery plant, the maximum rated throughput (metric tons sulfur produced/stream day), a description of the type of sulfur recovery plant, and an indication of the method used to calculate CO₂ annual emissions for the sulfur recovery plant (e.g., CO₂ CEMS, Equation Y-12, or process vent method in § 98.253(j)).

(3) The calculated CO₂ annual emissions for each on-site sulfur recovery plant, expressed in metric tons. The calculated annual CO₂ emissions from sour gas sent off-site for sulfur recovery, expressed in metric tons.

(4) If you use Equation Y-12 of this subpart, the annual volumetric flow to the on-site and off-site sulfur recovery plant (in scf/year), the molar volume conversion factor (in scf/kg-mole), and the annual average mole fraction of carbon in the sour gas (in kg-mole C/kg-mole gas).

(5) If you recycle tail gas to the front of an on-site sulfur recovery plant, indicate whether the recycled flow rate and carbon content are included in the measured data under § 98.253(f)(2) and (3). Indicate whether a correction for CO₂ emissions in the tail gas was used in Equation Y-12. If so, then report the value of the correction, the annual volume of recycled tail gas (in scf/year) and the annual average mole fraction of carbon in the tail gas (in kg-mole C/kg-mole gas). Indicate whether you used the default (95%) or a unit specific correction, and if a unit specific correction is used, report the approach used.

(6) If you use a CEMS, the relevant information required under § 98.36 for the Tier 4 Calculation Methodology, the CO₂ annual emissions as measured by the CEMS and the annual process CO₂ emissions calculated according to § 98.253(f)(1). Report the CO₂ annual emissions associated with fuel combustion in accordance with subpart C of this part (General Stationary Fuel Combustion Sources).

* * * * *

(j) * * *

(10) If you use Equation Y-19 of this subpart, the relevant information required under paragraph (l)(5) of this section.

(k) * * *

(4) For each set of coking drums that are the same dimensions: The number of

coking drums in the set, the height and diameter of the coke drums (in feet), the cumulative number of vessel openings for all delayed coking drums in the set, the typical venting pressure (in psig), void fraction (in cf gas/cf of vessel), and the mole fraction of methane in coking gas (in kg-mole CH₄/kg-mole gas, wet basis).

* * * * *

(6) If you use Equation Y-19 of this subpart, the relevant information required under paragraph (l)(5) of this section for each set of coke drums or vessels of the same size.

* * * * *

(o) * * *

(4) * * *

(vi) If you did not use Equation Y-23, the tank-specific methane composition data and the annual gas generation volume (scf/yr) used to estimate the cumulative CH₄ emissions for storage tanks used to process unstabilized crude oil.

* * * * *

Subpart Z—[AMENDED]

■ 59. Section 98.263 is amended by revising paragraph (b)(1)(ii) introductory text and the parameter “CO_{2n,i}” of Equation Z-1b to read as follows:

§ 98.263 Calculating GHG emissions.

* * * * *

(b) * * *

(1) * * *

(ii) If your process measurement provides the CO₂ content directly as an output, calculate and report the process CO₂ emissions from each wet-process phosphoric acid process line using Equation Z-1b of this section:

* * * * *

CO_{2n,i} = Carbon dioxide content of a grab sample batch of phosphate rock by origin i obtained during month n (percent by weight, expressed as a decimal fraction).

* * * * *

■ 60. Section 98.264 is amended by revising paragraphs (a) and (b) to read as follows:

§ 98.264 Monitoring and QA/QC requirements.

(a) You must obtain a monthly grab sample of phosphate rock directly from the rock being fed to the process line before it enters the mill using one of the following methods. You may conduct the representative bulk sampling using a method published by a consensus standards organization, or you may use industry consensus standard practice methods, including but not limited to the Phosphate Mining States Methods Used and Adopted by the Association of

Fertilizer and Phosphate Chemists (AFPC). If phosphate rock is obtained from more than one origin in a month, you must obtain a sample from each origin of rock or obtain a composite representative sample.

(b) You must determine the carbon dioxide or inorganic carbon content of each monthly grab sample of phosphate rock (consumed in the production of phosphoric acid). You may use a method published by a consensus standards organization, or you may use industry consensus standard practice methods, including but not limited to the Phosphate Mining States Methods Used and Adopted by AFPC.

* * * * *

■ 61. Section 98.265 is revised to read as follows:

§ 98.265 Procedures for estimating missing data.

A complete record of all measured parameters used in the GHG emissions calculations is required. Therefore, whenever a quality-assured value of a required parameter is unavailable, a substitute data value for the missing parameter must be used in the calculations as specified in paragraphs (a) and (b) of this section.

(a) For each missing value of the inorganic carbon content or CO₂ content of phosphate rock (by origin), you must use the appropriate default factor provided in Table Z-1 of this subpart. Alternatively, you must determine a substitute data value by calculating the arithmetic average of the quality-assured values of inorganic carbon contents or CO₂ contents of phosphate rock of origin i (see Equation Z-1a or Z-1b of this subpart) from samples immediately preceding and immediately following the missing data incident. If no quality-assured data on inorganic carbon contents or CO₂ contents of phosphate rock of origin i are available prior to the missing data incident, the substitute data value shall be the first quality-assured value for inorganic carbon contents or CO₂ contents for phosphate rock of origin i obtained after the missing data period.

(b) For each missing value of monthly mass consumption of phosphate rock (by origin), you must use the best available estimate based on all available process data or data used for accounting purposes.

■ 62. Section 98.266 is amended by revising paragraphs (a), (b), (d), and (f)(5), (6), and (8) to read as follows:

§ 98.266 Data reporting requirements.

* * * * *

(a) Annual phosphoric acid production, by origin of the phosphate rock (tons).

(b) Annual phosphoric acid production capacity (tons).

(d) Annual phosphate rock consumption from monthly measurement records by origin (tons).

(f) * * *

(5) Monthly inorganic carbon content of phosphate rock for each wet-process phosphoric acid process line for which Equation Z-1a is used (percent by weight, expressed as a decimal fraction), or CO₂ content (percent by weight, expressed as a decimal fraction) for which Equation Z-1b is used.

(6) Monthly mass of phosphate rock consumed, by origin, in production for each wet-process phosphoric acid process line (tons).

(8) Number of times missing data procedures were used to estimate phosphate rock consumption (months), inorganic carbon contents of the phosphate rock (months), and CO₂ contents of the phosphate rock (months).

■ 63. Section 98.267 is amended by revising paragraphs (a) and (c) to read as follows:

§ 98.267 Records that must be retained.

(a) Monthly mass of phosphate rock consumed by origin (tons).

(c) Documentation of the procedures used to ensure the accuracy of monthly phosphate rock consumption by origin.

Subpart AA—[AMENDED]

■ 64. Section 98.273 is amended by revising paragraph (a)(3) introductory text and the parameter “(EF)” of Equation AA-1 to read as follows:

§ 98.273 Calculating GHG emissions.

(a) * * *

(3) Calculate biogenic CO₂ emissions and emissions of CH₄ and N₂O from biomass using measured quantities of spent liquor solids fired, site-specific HHV, and default emissions factors, according to Equation AA-1 of this section:

(EF) = Default emission factor for CO₂, CH₄, or N₂O, from Table AA-1 of this subpart (kg CO₂, CH₄, or N₂O per mmBtu).

* * * * *

■ 65. Section 98.276 is amended by revising paragraphs (e) and (k) to read as follows:

§ 98.276 Data reporting requirements.

(e) The default emission factor for CO₂, CH₄, or N₂O, used in Equation AA-1 of this subpart (kg CO₂, CH₄, or N₂O per mmBtu).

(k) Total annual production of unbleached virgin chemical pulp produced onsite during the reporting year in air-dried metric tons per year. This total annual production value is the sum of all kraft, semichemical, soda, and sulfite pulp produced onsite, prior to bleaching, through all virgin pulping lines. Do not include mechanical pulp or secondary fiber repulped for paper production in the virgin pulp production total.

■ 66. Table AA-1 is revised to read as follows:

TABLE AA-1 TO SUBPART AA OF PART 98—KRAFT PULPING LIQUOR EMISSIONS FACTORS FOR BIOMASS-BASED CO₂, CH₄, AND N₂O

Wood furnish	Biomass-based emissions factors (kg/mmBtu HHV)		
	^a CO ₂	CH ₄	N ₂ O
North American Softwood	94.4	0.0019	0.00042
North American Hardwood	93.7	0.0019	0.00042
Bagasse	95.5	0.0019	0.00042
Bamboo	93.7	0.0019	0.00042
Straw	95.1	0.0019	0.00042

^a Includes emissions from both the recovery furnace and pulp mill lime kiln.

■ 67. Table AA-2 is revised to read as follows:

TABLE AA-2 TO SUBPART AA OF PART 98—KRAFT LIME KILN AND CALCINER EMISSIONS FACTORS FOR CH₄ AND N₂O

Fuel	Fossil fuel-based emissions factors (kg/mmBtu HHV)			
	Kraft lime kilns		Kraft calciners	
	CH ₄	N ₂ O	CH ₄	N ₂ O
Residual Oil (any type)	0.0027	0	0.0027	0.0003
Distillate Oil (any type)	0.0027	0	0.0027	0.0004
Natural Gas	0.0027	0	0.0027	0.0001
Biogas	0.0027	0	0.0027	0.0001
Petroleum coke	0.0027	0	^a NA	^a NA
Other Fuels	See Table C-2	0	See Table C-2	See Table C-2

^a Emission factors for kraft calciners are not available.

Subpart BB—[AMENDED]

■ 68. Section 98.282 is amended by revising paragraph (a) to read as follows:

§ 98.282 GHGs to report.

* * * * *

(a) CO₂ process emissions from all silicon carbide process units or furnaces combined.

* * * * *

■ 69. Section 98.283 is amended by:

■ a. Revising the introductory text.

■ b. Revising paragraphs (a), (b) introductory text, and (b)(2) introductory text.

■ c. Revising the parameter “T_n” in Equation BB–2 in paragraph (b)(2).

■ d. Removing paragraph (d).

The revisions read as follows:

§ 98.283 Calculating GHG emissions.

You must calculate and report the combined annual process CO₂ emissions from all silicon carbide process units and production furnaces using the procedures in either paragraph (a) or (b) of this section.

(a) Calculate and report under this subpart the combined annual process CO₂ emissions by operating and maintaining CEMS according to the Tier 4 Calculation Methodology specified in § 98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(b) Calculate and report under this subpart the combined annual process CO₂ emissions using the procedures in paragraphs (b)(1) and (b)(2) of this section.

* * * * *

(2) Calculate annual CO₂ process emissions from the silicon carbide production facility according to Equation BB–2 of this section:

* * * * *

T_n = Petroleum coke consumption in calendar month n (tons).

* * * * *

■ 70. Section 98.286 is amended by revising paragraph (b) introductory text to read as follows:

§ 98.286 Data reporting requirements.

* * * * *

(b) If a CEMS is not used to measure process CO₂ emissions, you must report the information in paragraph (b)(1) through (8) of this section for all silicon carbide process units or production furnaces combined:

* * * * *

Subpart DD—[AMENDED]

■ 71. Section 98.304 is amended by revising paragraphs (c)(1) and (2) to read as follows:

§ 98.304 Monitoring and QA/QC requirements.

* * * * *

(c) * * *

(1) Ensure that cylinders returned to the gas supplier are consistently weighed on a scale that is certified to be accurate and precise to within 2 pounds of true weight and is periodically recalibrated per the manufacturer’s specifications. Either measure residual gas (the amount of gas remaining in returned cylinders) or have the gas supplier measure it. If the gas supplier weighs the residual gas, obtain from the gas supplier a detailed monthly accounting, within ± 2 pounds, of residual gas amounts in the cylinders returned to the gas supplier.

(2) Ensure that cylinders weighed for the beginning and end of year inventory measurements are weighed on a scale that is certified to be accurate and precise to within 2 pounds of true weight and is periodically recalibrated per the manufacturer’s specifications. All scales used to measure quantities that are to be reported under § 98.306 must be calibrated using calibration procedures specified by the scale manufacturer. Calibration must be performed prior to the first reporting year. After the initial calibration, recalibration must be performed at the minimum frequency specified by the manufacturer.

* * * * *

Subpart FF—[AMENDED]

■ 72. Section 98.320 is amended by revising paragraphs (b)(1) and (2) to read as follows:

§ 98.320 Definition of the source category.

* * * * *

(b) * * *

(1) Each ventilation system shaft or vent hole, including both those points where mine ventilation air is emitted and those where it is sold, used onsite, or otherwise destroyed (including by ventilation air methane (VAM) oxidizers).

(2) Each degasification system well or gob gas vent hole, including degasification systems deployed before, during, or after mining operations are conducted in a mine area. This includes both those wells and vent holes where coal bed gas is emitted, and those where the gas is sold, used onsite, or otherwise destroyed (including by flaring).

* * * * *

■ 73. Section 98.322 is amended by revising paragraphs (b) and (d) to read as follows:

§ 98.322 GHGs to report.

* * * * *

(b) You must report CH₄ destruction from systems where gas is sold, used onsite, or otherwise destroyed (including by VAM oxidation and by flaring).

* * * * *

(d) You must report under this subpart the CO₂ emissions from coal mine gas CH₄ destruction occurring at the facility, where the gas is not a fuel input for energy generation or use (e.g., flaring and VAM oxidation).

* * * * *

■ 74. Section 98.323 is amended by:

■ a. Revising parameters “V”, “MCF”, “(f_{H2O})” and “P” of Equation FF–1 in paragraph (a).

■ b. Revising paragraph (a)(2).

■ c. Revising Equation FF–3 and revising parameters “V_i”, “MCF_i”, “(f_{H2O})”, and “P_i” of Equation FF–3 in paragraph (b).

■ d. Revising paragraph (b)(1).

■ e. Removing parameter “CH_{4D}” of Equation FF–4 of paragraph (b)(2) and adding parameter “(CH_{4D})_{i,j}” in its place.

■ f. Revising paragraph (c) introductory text and Equation FF–6 in paragraph (c)(1).

The revisions read as follows:

§ 98.323 Calculating GHG emissions.

(a) * * *

V = Volumetric flow rate for the quarter (acfm) based on sampling or a flow rate meter. If a flow rate meter is used and the meter automatically corrects to standard temperature and pressure, then use scfm and replace “520°R/T × P/1 atm” with “1”.

MCF = Moisture correction factor for the measurement period, volumetric basis.

= 1 when V and C are measured on a dry basis or if both are measured on a wet basis.

= 1-(f_{H2O}) when V is measured on a wet basis and C is measured on a dry basis.

= 1/[1-(f_{H2O})] when V is measured on a dry basis and C is measured on a wet basis.

(f_{H2O}) = Moisture content of the CH₄ emitted during the measurement period, volumetric basis (cubic feet water per cubic feet emitted gas).

* * * * *

P = Absolute pressure at which flow is measured (atm) for the quarter. The annual average barometric pressure from the nearest NOAA weather service station may be used as a default.

* * * * *

(2) Values of V, C, T, P, and (f_{H2O}), if applicable, must be based on measurements taken at least once each

quarter with no fewer than 6 weeks between measurements. If measurements are taken more frequently than once per quarter, then use the

average value for all measurements taken. If continuous measurements are taken, then use the average value over

the time period of continuous monitoring.

* * * * *
(b) * * *

$$CH_{4D} = \sum_{i=1}^n \left(V_i * MCF_i * \frac{C_i}{100\%} * 0.0423 \frac{520^\circ R}{T_i} * \frac{P_i}{1 atm} * 1,440 * \frac{0.454}{1,000} \right) \quad (\text{Eq. FF-3})$$

* * * * *
V_i = Measured volumetric flow rate for the days in the week when the degasification system is in operation at that monitoring point, based on sampling or a flow rate meter (acfm). If a flow rate meter is used and the meter automatically corrects to standard temperature and pressure, then use scfm and replace “520°R/T_i × P_i/1 atm” with “1”.

MCF_i = Moisture correction factor for the measurement period, volumetric basis. = 1 when V_i and C_i are measured on a dry basis or if both are measured on a wet basis.
= 1-(f_{H2O})_i when V_i is measured on a wet basis and C_i is measured on a dry basis.
= 1/[1-(f_{H2O})_i] when V_i is measured on a dry basis and C_i is measured on a wet basis.

(f_{H2O}) = Moisture content of the CH₄ emitted during the measurement period,

volumetric basis (cubic feet water per cubic feet emitted gas).

* * * * *
P_i = Absolute pressure at which flow is measured (atm).

* * * * *
(1) Values for V, C, T, P, and (f_{H2O}), if applicable, must be based on measurements taken at least once each calendar week with at least 3 days between measurements. If measurements are taken more frequently than once per week, then use the average value for all measurements taken that week. If continuous measurements are taken, then use the average values over the time period of continuous monitoring when the continuous monitoring equipment is properly functioning.

(2) * * *
* * * * *

(CH_{4D})_{i,j} = Weekly CH₄ liberated from a degasification monitoring point (metric tons CH₄).

* * * * *

(c) If gas from a degasification system or ventilation system is sold, used onsite, or otherwise destroyed (including by flaring or VAM oxidation), you must calculate the quarterly CH₄ destroyed for each destruction device and each point of offsite transport to a destruction device, using Equation FF-5 of this section. You must measure CH₄ content and flow rate according to the provisions in § 98.324, and calculate the methane routed to the destruction device (CH₄) using either Equation FF-1 or Equation FF-4 of this section, as applicable.

* * * * *
(1) * * *

$$CH_{4Destroyed Total} = \sum_{i=1}^d (CH_{4Destroyed i}) \quad (\text{Eq. FF-6})$$

* * * * *
■ 75. Section 98.324 is amended by revising paragraphs (b) introductory text and (c)(2) to read as follows:

§ 98.324 Monitoring and QA/QC requirements.

* * * * *
(b) For CH₄ liberated from ventilation systems, determine whether CH₄ will be monitored from each ventilation shaft and vent hole, from a centralized monitoring point, or from a combination of the two options. Operators are allowed flexibility for aggregating emissions from more than one ventilation point, as long as emissions from all are addressed, and the methodology for calculating total emissions documented. Monitor by one of the following options:

* * * * *
(c) * * *
(2) Collect weekly (once each calendar week, with at least three days between measurements) or more frequent samples, for all degasification wells and gob gas vent holes. Determine weekly or

more frequent flow rates, methane concentration, temperature, and pressure from these degasification wells and gob gas vent holes. Methane composition should be determined either by submitting samples to a lab for analysis, or from the use of methanometers at the degasification monitoring site. Follow the sampling protocols for sampling of methane emissions from ventilation shafts, as described in § 98.324(b)(1). You must record the date of sampling, flow, temperature, pressure, and moisture measurements, the methane concentration (percent), the bottle number of samples collected, and the location of the measurement or collection.

* * * * *
■ 76. Section 98.326 is amended by revising paragraphs (a), (f), (h), (i), (j), (o), and (r), and adding paragraph (t) to read as follows:

§ 98.326 Data reporting requirements.

* * * * *

(a) Quarterly CH₄ liberated from each ventilation monitoring point, (metric tons CH₄).

* * * * *

(f) Quarterly volumetric flow rate for each ventilation monitoring point and units of measure (scfm or acfm), date and location of each measurement, and method of measurement (quarterly sampling or continuous monitoring), used in Equation FF-1 of this subpart.

* * * * *

(h) Weekly volumetric flow rate used to calculate CH₄ liberated from degasification systems and units of measure (acfm or scfm), and method of measurement (sampling or continuous monitoring), used in Equation FF-3 of this subpart.

(i) Quarterly CH₄ concentration (%) used to calculate CH₄ liberated from degasification systems and if the data is based on CEMS or weekly sampling.

(j) Weekly volumetric flow rate used to calculate CH₄ destruction for each destruction device and each point of

offsite transport, and units of measure (acfm or scfm).

* * * * *

(o) Temperatures (°R), pressure (atm), moisture content, and the moisture correction factor (if applicable) used in Equation FF-1 and FF-3 of this subpart; and the gaseous organic concentration correction factor, if Equation FF-9 was required.

* * * * *

(r) Identification information and description for each well, shaft, and vent hole, including paragraphs (r)(1) through (r)(3) of this section:

(1) Indication of whether the well, shaft, or vent hole is monitored individually, or as part of a centralized monitoring point. Note which method (sampling or continuous monitoring) was used.

(2) Start date and close date of each well, shaft, and vent hole.

(3) Number of days the well, shaft, or vent hole was in operation during the reporting year.

* * * * *

(t) Mine Safety and Health Administration (MSHA) identification for this coal mine.

Subpart HH—[AMENDED]

■ 77. Section 98.340 is amended by revising paragraph (a) to read as follows:

§ 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.

(2) The MSW landfill had CH₄ generation as determined using Equation HH-5 and, if applicable, Equation HH-7 of this subpart of less than 1,190 metric tons of CH₄ in the 2013 reporting year.

(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.

* * * * *

■ 78. Section 98.343 is amended by:

■ a. Revising the parameters “DOC” and “F” of Equation HH-1 in paragraph (a)(1).

■ b. Revising Equation HH-4 and the parameters “N” and “0.0423” of Equation HH-4 in paragraph (b)(1).

■ c. Revising paragraphs (b)(2)(i), (b)(2)(ii), (b)(2)(iii)(A), and (b)(2)(iii)(B).

■ d. Revising parameter “OX” of Equation HH-5 in paragraph (c)(1).

■ e. Revising paragraphs (c)(3)(i) and (ii).

The revisions read as follows:

§ 98.343 Calculating GHG emissions.

(a) * * *

(1) * * *

* * * * *

DOC = Degradable organic carbon from Table HH-1 of this subpart [fraction (metric tons C/metric ton waste)].

* * * * *

F = Fraction by volume of CH₄ in landfill gas from measurement data for the current reporting year, if available (fraction, dry basis, corrected to 0% oxygen); otherwise, use the default of 0.5.

* * * * *

(b) * * *

(1) * * *

(Eq. HH-4)

$$R = \sum_{n=1}^N \left((V)_n \times (K_{MC})_n \times \frac{(C_{CH_4})_n}{100\%} \times 0.0423 \times \frac{520^\circ R}{(T)_n} \times \frac{(P)_n}{1 \text{ atm}} \times \frac{0.454}{1,000} \right)$$

* * * * *

N = Total number of measurement periods in a year. Use daily averaging periods for a continuous monitoring system and N = 365 (or N = 366 for leap years). For monthly sampling, as provided in paragraph (b)(2) of this section, use N=12.

* * * * *

0.0423 = Density of CH₄ lb/cf at 520°R or 60 degrees Fahrenheit and 1 atm.

* * * * *

(2) * * *

(i) Continuously monitor gas flow rate and determine the cumulative volume of landfill gas each month and the cumulative volume of landfill gas each year that is collected and routed to a destruction device (before any treatment equipment). Under this option, the gas flow meter is not required to automatically correct for temperature, pressure, or, if necessary, moisture content. If the gas flow meter is not equipped with automatic correction for temperature, pressure, or, if necessary, moisture content, you must determine

these parameters as specified in paragraph (b)(2)(iii) of this section.

(ii) Determine the CH₄ concentration in the landfill gas that is collected and routed to a destruction device (before any treatment equipment) in a location near or representative of the location of the gas flow meter at least once each calendar month; if only one measurement is made each calendar month, there must be at least fourteen days between measurements.

(iii) * * *

(A) Determine the temperature and pressure in the landfill gas that is collected and routed to a destruction device (before any treatment equipment) in a location near or representative of the location of the gas flow meter at least once each calendar month; if only one measurement is made each calendar month, there must be at least fourteen days between measurements.

(B) If the CH₄ concentration is determined on a dry basis and flow is determined on a wet basis or CH₄ concentration is determined on a wet

basis and flow is determined on a dry basis, and the flow meter does not automatically correct for moisture content, determine the moisture content in the landfill gas that is collected and routed to a destruction device (before any treatment equipment) in a location near or representative of the location of the gas flow meter at least once each calendar month; if only one measurement is made each calendar month, there must be at least fourteen days between measurements.

(c) * * *

(1) * * *

* * * * *

OX = Oxidation fraction. Use the appropriate oxidation fraction default value from Table HH-4 of this subpart.

* * * * *

(3) * * *

(i) Calculate CH₄ emissions from the modeled CH₄ generation and measured CH₄ recovery using Equation HH-6 of this section.

$$\text{Emissions} = \left[\left(G_{\text{CH}_4} - \sum_{n=1}^N R_n \right) \times (1 - \text{OX}) + \sum_{n=1}^N \left\{ R_n \times \left(1 - \left(\text{DE}_n \times f_{\text{Dest},n} \right) \right) \right\} \right] \quad (\text{Eq. HH-6})$$

Where:

Emissions = Methane emissions from the landfill in the reporting year (metric tons CH₄).

G_{CH₄} = Modeled methane generation rate in reporting year from Equation HH-1 of this section or the quantity of recovered CH₄ from Equation HH-4 of this section, whichever is greater (metric tons CH₄).

N = Number of landfill gas measurement locations (associated with a destruction device or gas sent off-site). If a single monitoring location is used to monitor volumetric flow and CH₄ concentration of the recovered gas sent to one or multiple destruction devices, then N=1.

R_n = Quantity of recovered CH₄ from Equation HH-4 of this section for the nth measurement location (metric tons).

OX = Oxidation fraction. Use the appropriate oxidation fraction default value from Table HH-4 of this subpart.

DE_n = Destruction efficiency (lesser of manufacturer's specified destruction efficiency and 0.99) for the nth measurement location. If the gas is transported off-site for destruction, use DE = 1. If the volumetric flow and CH₄ 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 DE_n as the arithmetic average of the DE values determined for each destruction device associated with that measurement location.

f_{Dest,n} = 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

hours flow was sent to the destruction device as measured at the nth measurement location. If the gas is transported off-site for destruction, use f_{Dest,n} = 1. If the volumetric flow and CH₄ 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 f_{Dest} values determined for each destruction device associated with that measurement location.

(ii) Calculate CH₄ generation and CH₄ emissions using measured CH₄ recovery and estimated gas collection efficiency and Equations HH-7 and HH-8 of this section.

$$\text{MG} = \frac{1}{\text{CE}} \sum_{n=1}^N \left[\frac{R_n}{f_{\text{Rec},n}} \right] \times (1 - \text{OX}) \quad (\text{Eq. HH-7})$$

$$\text{Emissions} = \left[\left(\frac{1}{\text{CE}} \left\{ \sum_{n=1}^N \left[\frac{R_n}{f_{\text{Rec},n}} \right] \right\} - \sum_{n=1}^N R_n \right) \times (1 - \text{OX}) + \sum_{n=1}^N \left\{ R_n \times \left(1 - \left(\text{DE}_n \times f_{\text{Dest},n} \right) \right) \right\} \right] \quad (\text{Eq. HH-8})$$

Where:

MG = Methane generation, adjusted for oxidation, from the landfill in the reporting year (metric tons CH₄).

Emissions = Methane emissions from the landfill in the reporting year (metric tons CH₄).

N = Number of landfill gas measurement locations (associated with a destruction device or gas sent off-site). If a single monitoring location is used to monitor volumetric flow and CH₄ concentration of the recovered gas sent to one or multiple destruction devices, then N=1.

R_n = Quantity of recovered CH₄ from Equation HH-4 of this section for the nth measurement location (metric tons CH₄).

CE = Collection efficiency estimated at landfill, taking into account system coverage, operation, and cover system materials from Table HH-3 of this subpart. If area by soil cover type information is not available, use default value of 0.75 (CE4 in table HH-3 of this subpart) for all areas under active influence of the collection system.

f_{Rec,n} = Fraction of hours the recovery system associated with the nth measurement location was operating (annual operating hours/8760 hours per year or annual operating hours/8784 hours per year for a leap year).

OX = Oxidation fraction. Use appropriate oxidation fraction default value from Table HH-4 of this subpart.

DE_n = Destruction efficiency, (lesser of manufacturer's specified destruction efficiency and 0.99) for the nth measurement location. If the gas is transported off-site for destruction, use DE = 1. If the volumetric flow and CH₄ 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 DE_n as the arithmetic average of the DE values determined for each destruction device associated with that measurement location.

f_{Dest,n} = 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 hours flow was sent to the destruction device as measured at the nth measurement location. If the gas is transported off-site for destruction, use f_{Dest,n} = 1. If the volumetric flow and CH₄ 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 f_{Dest} values determined for each destruction device associated with that measurement location.

■ 79. Section 98.344 is amended by revising paragraph (e) and adding paragraph (f) to read as follows:

§ 98.344 Monitoring and QA/QC requirements.

* * * * *

(e) For landfills electing to measure the fraction by volume of CH₄ in landfill gas (F), follow the requirements in paragraphs (e)(1) and (2) of this section.

(1) Use a gas composition monitor capable of measuring the concentration of CH₄ on a dry basis that is properly operated, calibrated, and maintained according to the requirements specified in paragraph (b) of this section. You must either use a gas composition monitor that is also capable of measuring the O₂ concentration correcting for excess (infiltration) air or you must operate, maintain, and

calibrate a second monitor capable of measuring the O₂ concentration on a dry basis according to the manufacturer's specifications.

(2) Use Equation HH-10 of this section to correct the measured CH₄ concentration to 0% oxygen. If multiple CH₄ concentration measurements are made during the reporting year,

determine F separately for each measurement made during the reporting year, and use the results to determine the arithmetic average value of F for use in Equation HH-1 of this part.

$$F = \left(\frac{C_{CH_4}}{100\%} \right) \times \left[\frac{20.9_c}{(20.9 - \%O_2)} \right] \quad \text{(Eq. HH-10)}$$

Where:

F = Fraction by volume of CH₄ in landfill gas (fraction, dry basis, corrected to 0% oxygen).

C_{CH₄} = Measured CH₄ concentration in landfill gas (volume %, dry basis).

20.9_c = Defined O₂ correction basis, (volume %, dry basis).

20.9 = O₂ concentration in air (volume %, dry basis).

%O₂ = Measured O₂ concentration in landfill gas (volume %, dry basis).

(f) The owner or operator shall document the procedures used to ensure the accuracy of the estimates of disposal quantities and, if applicable, gas flow rate, gas composition, temperature, pressure, and moisture content measurements. These procedures include, but are not limited to, calibration of weighing equipment, fuel flow meters, and other measurement devices. The estimated accuracy of measurements made with these devices, and the technical basis for these estimates shall be recorded.

■ 80. Section 98.345 is amended by revising paragraph (c) to read as follows:

§ 98.345 Procedures for estimating missing data.

* * * * *

(c) For missing daily waste disposal quantity data for disposal in the reporting year, the substitute value shall be the average daily waste disposal quantity for that day of the week as measured on the week before and week after the missing daily data.

■ 81. Section 98.346 is amended by revising paragraphs (d)(1), (e), (h), (i)(5) through (8), and (i)(10) through (12) to read as follows:

§ 98.346 Data reporting requirements.

* * * * *

(d) * * *

(1) Degradable organic carbon (DOC) and fraction of DOC dissimilated (DOC_F) values used in the calculations.

* * * * *

(e) Fraction of CH₄ in landfill gas (F), an indication of whether the fraction of CH₄ was determined based on measured values or the default value, and the methane correction factor (MCF) used in the calculations. If an MCF other than the default of 1 is used, provide an

indication of whether active aeration of the waste in the landfill was conducted during the reporting year, a description of the aeration system, including aeration blower capacity, the fraction of the landfill containing waste affected by aeration, the total number of hours during the year the aeration blower was operated, and other factors used as a basis for the selected MCF value.

* * * * *

(h) For landfills without gas collection systems, the annual methane emissions (i.e., the methane generation, adjusted for oxidation, calculated using Equation HH-5 of this subpart), reported in metric tons CH₄, the oxidation fraction used in the calculation, and an indication of whether passive vents and/or passive flares (vents or flares that are not considered part of the gas collection system as defined in § 98.6) are present at this landfill.

(i) * * *

(5) An indication of whether destruction occurs at the landfill facility, off-site, or both. If destruction occurs at the landfill facility, also report for each measurement location the number of destruction devices associated with that measurement location and the annual operating hours and the destruction efficiency (percent) for each destruction device associated with that measurement location.

(6) Annual quantity of recovered CH₄ (metric tons CH₄) calculated using Equation HH-4 of this subpart for each measurement location.

(7) A description of the gas collection system (manufacturer, capacity, and number of wells), the surface area (square meters) and estimated waste depth (meters) for each area specified in Table HH-3 to this subpart, the estimated gas collection system efficiency for landfills with this gas collection system, the annual operating hours of the gas collection system for each measurement location, and an indication of whether passive vents and/or passive flares (vents or flares that are not considered part of the gas collection system as defined in § 98.6) are present at the landfill.

(8) Methane generation corrected for oxidation calculated using Equation

HH-5 of this subpart, reported in metric tons CH₄, and the oxidation fraction used in the calculation.

* * * * *

(10) Methane generation corrected for oxidation calculated using Equation HH-7 of this subpart, reported in metric tons CH₄, and the oxidation fraction used in the calculation.

(11) Methane emissions calculated using Equation HH-6 of this subpart, reported in metric tons CH₄, and the oxidation fraction used in the calculation.

(12) Methane emissions calculated using Equation HH-8 of this subpart, reported in metric tons CH₄, and the oxidation fraction used in the calculation.

■ 82. Section 98.348 is amended by adding definitions for "Landfill capacity" and "Leachate recirculation" in alphabetical order to read as follows:

§ 98.348 Definitions.

* * * * *

Landfill capacity means the maximum amount of solid waste a landfill can accept. For the purposes of this subpart, for landfills that have a permit, the *landfill capacity* can be determined in terms of volume or mass in the most recent permit issued by the state, local, or Tribal agency responsible for regulating the landfill, plus any in-place waste not accounted for in the most recent permit. If the owner or operator chooses to convert from volume to mass to determine its capacity, the calculation must include a site-specific density.

Leachate recirculation means the practice of taking the leachate collected from the landfill and reapplying it to the landfill by any of one of a variety of methods, including pre-wetting of the waste, direct discharge into the working face, spraying, infiltration ponds, vertical injection wells, horizontal gravity distribution systems, and pressure distribution systems.

* * * * *

■ 83. Table HH-1 to Subpart HH is amended by revising the entry for "OX" to read as follows:

TABLE HH-1 TO SUBPART HH OF PART 98—EMISSIONS FACTORS, OXIDATION FACTORS AND METHODS

Factor	Default value	Units
* * * * *		
Other parameters—All MSW landfills		
* * * * *		
OX	See Table HH-4 of this subpart.
* * * * *		

■ 84. Table HH-2 to Subpart HH is revised to read as follows:

TABLE HH-2 TO SUBPART HH OF PART 98—U.S. PER CAPITA WASTE DISPOSAL RATES

Year	Waste per capita ton/cap/yr
1950	0.63
1951	0.63
1952	0.63
1953	0.63
1954	0.63
1955	0.63
1956	0.63
1957	0.63

TABLE HH-2 TO SUBPART HH OF PART 98—U.S. PER CAPITA WASTE DISPOSAL RATES—Continued

Year	Waste per capita ton/cap/yr
1958	0.63
1959	0.63
1960	0.63
1961	0.64
1962	0.64
1963	0.65
1964	0.65
1965	0.66
1966	0.66
1967	0.67
1968	0.68
1969	0.68
1970	0.69
1971	0.69
1972	0.70
1973	0.71
1974	0.71
1975	0.72
1976	0.73
1977	0.73
1978	0.74
1979	0.75
1980	0.75
1981	0.76
1982	0.77
1983	0.77
1984	0.78
1985	0.79
1986	0.79

TABLE HH-2 TO SUBPART HH OF PART 98—U.S. PER CAPITA WASTE DISPOSAL RATES—Continued

Year	Waste per capita ton/cap/yr
1987	0.80
1988	0.80
1989	0.83
1990	0.82
1991	0.76
1992	0.74
1993	0.76
1994	0.75
1995	0.70
1996	0.68
1997	0.69
1998	0.75
1999	0.75
2000	0.80
2001	0.91
2002	1.02
2003	1.02
2004	1.01
2005	0.98
2006	0.95
2007	0.95
2008	0.95
2009 and all later years	0.95

■ 85. Table HH-4 to Subpart HH is added to read as follows:

TABLE HH-4 TO SUBPART HH OF PART 98—LANDFILL METHANE OXIDATION FRACTIONS

Under these conditions:		Use this landfill methane oxidation fraction:
I. For all reporting years prior to the 2013 reporting year		
C1: For all landfills regardless of cover type or methane flux		0.10
II. For the 2013 reporting year and all subsequent years		
C2: For landfills that have a geomembrane (synthetic) cover with less than 12 inches of cover soil for the majority of the landfill area containing waste		0.0
C3: For landfills that do not meet the conditions in C2 above, and for which you elect not to determine methane flux		0.10
C4: For landfills that do not meet the conditions in C2 above and that do not have a soil cover of at least 24 inches for a majority of the landfill area containing waste		0.10
C5: For landfills that have a soil cover of at least 24 inches for a majority of the landfill area containing waste and for which the methane flux rate is less than 10 grams per square meter per day (g/m ² /d)		0.35
C6: For landfills that have a soil cover of at least 24 inches for a majority of the landfill area containing waste and for which the methane flux rate is 10 to 70 g/m ² /d		0.25
C7: For landfills that have a soil cover of at least 24 inches for a majority of the landfill area containing waste and for which the methane flux rate is greater than 70 g/m ² /d		0.10

^a Methane flux rate (in grams per square meter per day; g/m²/d) is the mass flow rate of methane per unit area at the bottom of the surface soil prior to any oxidation and is calculated as follows:

For Equation HH-5 of this subpart, or for Equation TT-6 of subpart TT of this part,

$$MF = K \times G_{CH4} / SArea$$

For Equation HH-6 of this subpart,

$$MF = K \times \left(G_{CH4} - \sum_{n=1}^N R_n \right) / SArea$$

For Equations HH-7 of this subpart,

$$MF = K \times \left(\frac{1}{CE} \sum_{n=1}^N \left[\frac{R_n}{f_{Rec,n}} \right] \right) / SArea$$

For Equation HH-8 of this subpart,

$$MF = K \times \left(\frac{1}{CE} \left\{ \sum_{n=1}^N \left[\frac{R_n}{f_{Rec,n}} \right] \right\} - \sum_{n=1}^N R_n \right) / SArea$$

Where:

MF = Methane flux rate from the landfill in the reporting year (grams per square meter per day, g/m²/d).

K = unit conversion factor = 10⁶/365 (g/metric ton per days/year) or 10⁶/366 for a leap year.

SArea = The surface area of the landfill containing waste at the beginning of the reporting year (square meters, m²).

G_{CH4} = Modeled methane generation rate in reporting year from Equation HH-1 of this subpart or Equation TT-1 of subpart TT of this part, as applicable, except for application with Equation HH-6 of this subpart (metric tons CH₄). For application with Equation HH-6 of this subpart, the greater of the modeled methane generation rate in reporting year from Equation HH-1 of this subpart or Equation TT-1 of this part, as applicable, and the quantity of recovered CH₄ from Equation HH-4 of this subpart (metric tons CH₄).

CE = Collection efficiency estimated at landfill, taking into account system coverage, operation, and cover system materials from Table HH-3 of this subpart. If area by soil cover type information is not available, use default value of 0.75 (CE4 in table HH-3 of this subpart) for all areas under active influence of the collection system.

N = Number of landfill gas measurement locations (associated with a destruction device or gas sent off-site). If a single monitoring location is used to monitor volumetric flow and CH₄ concentration of the recovered gas sent to one or multiple destruction devices, then N=1.

R_n = Quantity of recovered CH₄ from Equation HH-4 of this subpart for the nth measurement location (metric tons).
 f_{Rec,n} = Fraction of hours the recovery system associated with the nth measurement location was operating (annual operating hours/8760 hours per year or annual operating hours/8784 hours per year for a leap year).

Subpart II—[AMENDED]

■ 86. Section 98.353 is amended by revising the parameters “f_{Dest_1}” and “f_{Dest_2}” of Equation II-6 in paragraph (d)(2) to read as follows:

§ 98.353 Calculating GHG emissions.

* * * * *
 (d) * * *
 (2) * * *
 * * * * *

f_{Dest_1} = Fraction of hours the primary destruction device was operating calculated as the annual hours when the destruction device was operating divided by the annual operating hours of the biogas recovery system. If the biogas is transported off-site for destruction, use f_{Dest} = 1.

* * * * *
 f_{Dest_2} = Fraction of hours the back-up destruction device was operating calculated as the annual hours when the destruction device was operating divided by the annual operating hours of the biogas recovery system.

* * * * *

Subpart LL—[AMENDED]

- 87. Section 98.386 is amended by:
 - a. Removing and reserving paragraphs (a)(1) and (5).
 - b. Revising paragraph (a)(4), (a)(8), (a)(9)(v), (a)(11)(v), and (a)(12) introductory text.
 - c. Removing and reserving paragraph (a)(13).
 - d. Revising paragraphs (a)(14), (15) and (18).
 - e. Removing and reserving paragraph (b)(1).
 - f. Revising paragraphs (b)(4), (b)(5)(v), and (b)(6)(i).
 - g. Removing and reserving paragraph (c)(1).
 - h. Revising paragraphs (c)(4), (c)(5)(v), and (d)(2) and (3).

The revisions read as follows:

§ 98.386 Data reporting requirements.

* * * * *

(a) * * *

(4) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (a)(2) of this section.

* * * * *

(8) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (a)(6) of this section.

(9) * * *

(v) The calculated CO₂ emissions factor in metric tons CO₂ per barrel or per metric ton of product.
* * * *

(11) * * *

(v) The calculated CO₂ emissions factor in metric tons CO₂ per barrel or metric ton of product.
* * * *

(12) For every non-solid product reported in paragraph (a)(6) of this section for which Calculation Method 2 of subpart MM of this part was used to determine an emissions factor, report:
* * * *

(14) For each specific type of biomass that enters the coal-to-liquid facility to be co-processed with fossil fuel-based feedstock to produce a product reported in paragraph (a)(6) of this section, report the annual quantity in metric tons or barrels.

(15) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (a)(14) of this section.
* * * *

(18) Annual CO₂ emissions in metric tons that would result from the complete combustion or oxidation of each type of biomass feedstock co-processed with fossil fuel-based feedstocks reported in paragraph (a)(14) of this section, calculated according to § 98.393(c).
* * * *

(b) * * *

(4) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (b)(2) of this section.

(5) * * *

(v) The calculated CO₂ emissions factor in metric tons per barrel or per metric ton of product.

(6) * * *

(i) The density test results in metric tons per barrel.
* * * *

(c) * * *

(4) Each standard method or other industry standard practice used to measure each quantity reported in paragraph (c)(2) of this section.

(5) * * *

(v) The calculated CO₂ emissions factor in metric tons CO₂ per barrel or per metric ton of product.
* * * *

(d) * * *

(2) For a product that enters the facility to be further refined or otherwise used on site that is a blended feedstock, producers must meet the reporting requirements of paragraph (a)(2) of this section by reflecting the individual components of the blended feedstock.

(3) For a product that is produced, imported, or exported that is a blended product, producers, importers, and exporters must meet the reporting requirements of paragraphs (a)(6), (b)(2), and (c)(2) of this section, as applicable, by reflecting the individual components of the blended product.

Subpart MM—[AMENDED]

■ 88. Section 98.393 is amended by:

■ a. Revising the parameter “Product_i” of Equation MM–1 in paragraph (a)(1).

■ b. Revising the parameter “Product_i” of Equation MM–1 in paragraph (a)(2).

■ c. Revising paragraphs (h)(1) introductory text and (h)(2) introductory text.

The revisions read as follows:

§ 98.393 Calculating GHG emissions.

(a) * * *

(1) * * *

Product_i = Annual volume of product “i” produced, imported, or exported by the reporting party (barrels). For refiners, this volume only includes products ex refinery gate, and excludes products that entered the refinery but are not reported under § 98.396(a)(2). For natural gas liquids, volumes shall reflect the individual components of the product as listed in Table MM–1 to subpart MM.

* * * *

(2) * * *

* * * *

Product_i = Annual mass of product “i” produced, imported, or exported by the reporting party (metric tons). For refiners, this mass only includes products ex refinery gate, and excludes products that entered the refinery but are not reported under § 98.396(a)(2).

* * * *

(h) * * *

(1) A reporter using Calculation Method 1 to determine the emission factor of a petroleum product shall calculate the CO₂ emissions associated with that product using Equation MM–8 of this section in place of Equation MM–1 of this section.
* * * *

(2) A refinery using Calculation Method 1 of this subpart to determine the emission factor of a non-crude petroleum feedstock shall calculate the CO₂ emissions associated with that feedstock using Equation MM–9 of this section in place of Equation MM–2 of this section.
* * * *

■ 89. Section 98.394 is amended by:

■ a. Revising paragraphs (a)(1) introductory text and (a)(3).

■ b. Adding paragraph (b)(3).

■ c. Revising paragraph (c) introductory text.

■ d. Removing paragraph (d).

The revisions and addition read as follows:

§ 98.394 Monitoring and QA/QC requirements.

(a) * * *

(1) The quantity of petroleum products, natural gas liquids, and biomass, shall be determined as follows:
* * * *

(3) The annual quantity of crude oil received shall be determined according to one of the following methods. You may use an appropriate standard method published by a consensus-based standards organization or you may use an industry standard practice.

(b) * * *

(3) For units and processes that operate continuously with infrequent outages, it may not be possible to complete the calibration of a flow meter or other measurement device without disrupting normal process operation. In such cases, the owner or operator may postpone the calibration until the next scheduled maintenance outage. The best available information from company records may be used in the interim. Such postponements shall be documented in the monitoring plan that is required under § 98.3(g)(5).

(c) Procedures for Calculation Method 2 of this subpart.

* * * *

■ 90. Section 98.395 is amended by revising paragraphs (a) introductory text and (b) and removing paragraph (c).

The revisions read as follows:

§ 98.395 Procedures for estimating missing data.

(a) *Determination of quantity.*

Whenever the quality assurance procedures in § 98.394(a) cannot be followed to measure the quantity of one or more petroleum products, natural gas liquids, types of biomass, feedstocks, or crude oil during any period (e.g., if a meter malfunctions), the following missing data procedures shall be used:
* * * *

(b) *Determination of emission factor.*

Whenever any of the procedures in § 98.394(c) cannot be followed to develop an emission factor for any reason, Calculation Method 1 of this subpart must be used in place of Calculation Method 2 of this subpart for the entire reporting year.

■ 91. Section 98.396 is amended by:

■ a. Removing and reserving paragraph (a)(1).

■ b. Removing and reserving paragraphs (a)(4), (5), and (8).

■ c. Revising paragraphs (a)(9) introductory text, (a)(9)(iii), (a)(9)(v),

- (a)(10) introductory text, (a)(11) introductory text, and (a)(11)(iii).
- d. Removing and reserving paragraphs (a)(13) and (15).
- e. Revising paragraph (a)(18).
- f. Revising paragraphs (a)(20) through (22).
- g. Removing paragraph (a)(23).
- h. Removing and reserving paragraph (b)(1).
- i. Revising paragraph (b)(2).
- j. Removing and reserving paragraph (b)(4).
- k. Revising paragraphs (b)(5) introductory text and (b)(6) introductory text.
- l. Removing and reserving paragraphs (c)(1) and (4).
- m. Revising paragraphs (c)(5) introductory text, (c)(6) introductory text, and (d)(2) and (3).
- The revisions read as follows:

§ 98.396 Data reporting requirements.

* * * * *

(a) * * *

(9) For every feedstock reported in paragraph (a)(2) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * * *

(iii) The carbon share test results in percent mass.

* * * * *

(v) The calculated CO₂ emissions factor in metric tons CO₂ per barrel or per metric ton of product.

(10) For every non-solid feedstock reported in paragraph (a)(2) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * * *

(11) For every petroleum product and natural gas liquid reported in paragraph (a)(6) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * * *

(iii) The carbon share test results in percent mass.

* * * * *

(18) The CO₂ emissions in metric tons that would result from the complete combustion or oxidation of each type of biomass feedstock co-processed with petroleum feedstocks reported in paragraph (a)(14) of this section, calculated according to § 98.393(c).

* * * * *

(20) For all crude oil that enters the refinery, report the annual quantity in barrels.

(21) The quantity of bulk NGLs in metric tons or barrels received for processing during the reporting year. Report only quantities of bulk NGLs not reported in (a)(2) of this section.

(22) Volume of crude oil in barrels that you injected into a crude oil supply or reservoir.

* * * * *

(b) * * *

* * * * *

(2) For each petroleum product and natural gas liquid listed in Table MM-1 of this subpart, report the annual quantity in metric tons or barrels. For natural gas liquids, quantity shall reflect the individual components of the product.

* * * * *

(5) For each product reported in paragraph (b)(2) of this section for which Calculation Method 2 of this subpart used was used to determine an emissions factor, report:

* * * * *

(6) For each non-solid product reported in paragraph (b)(2) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * * *

(c) * * *

(5) For each product reported in paragraph (c)(2) of this section for which Calculation Method 2 of this subpart was used to determine an emissions factor, report:

* * * * *

(6) For each non-solid product reported in paragraph (c)(2) of this section for which Calculation Method 2 of this subpart used was used to determine an emissions factor, report:

* * * * *

(d) * * *

(2) For a product that enters the refinery to be further refined or otherwise used on site that is a blended non-crude feedstock, refiners must meet the reporting requirements of paragraph (a)(2) of this section by reflecting the individual components of the blended non-crude feedstock.

(3) For a product that is produced, imported, or exported that is a blended product, refiners, importers, and exporters must meet the reporting requirements of paragraphs (a)(6), (b)(2), and (c)(2) of this section, as applicable, by reflecting the individual components of the blended product.

■ 92. Section 98.397 is amended by revising paragraphs (b) and (d) to read as follows:

§ 98.397 Records that must be retained.

* * * * *

(b) Reporters shall maintain records to support quantities that are reported under this subpart, including records documenting any estimations of missing data and the number of calendar days in the reporting year for which substitute data procedures were followed. For all reported quantities of petroleum products, natural gas liquids, and biomass, reporters shall maintain metering, gauging, and other records normally maintained in the course of business to document product and feedstock flows including the date of initial calibration and the frequency of recalibration for the measurement equipment used.

* * * * *

(d) Reporters shall maintain laboratory reports, calculations and worksheets used in the measurement of density and carbon share for any petroleum product or natural gas liquid for which CO₂ emissions were calculated using Calculation Method 2.

* * * * *

■ 93. Section 98.398 is amended by:

■ a. Adding the definitions for “Bulk NGLs” and “Natural Gas Liquids (NGLs)” in alphabetical order.

■ b. Removing the definition of “Batch”.

The revisions read as follows:

§ 98.398 Definitions.

* * * * *

Bulk NGLs for purposes of reporting under this subpart means mixtures of NGLs that are sold or delivered as undifferentiated product.

Natural Gas Liquids (NGLs) for the purposes of reporting under this subpart means hydrocarbons that are separated from natural gas as liquids through the process of absorption, condensation, adsorption, or other methods, and are sold or delivered as differentiated product. Generally, such liquids consist of ethane, propane, butanes, or pentanes plus.

■ 94. Table MM-1 to Subpart MM is amended by:

■ a. Revising the entries for Ethane, Ethylene, Propane, Propylene, Butane, Butylene, Isobutane, and Isobutylene.

■ b. Adding footnotes 3 and 4.

TABLE MM-1 TO SUBPART MM OF PART 98—DEFAULT FACTORS FOR PETROLEUM PRODUCTS AND NATURAL GAS LIQUIDS^{1 2}

Products	Column A: density (metric tons/ bbl)	Column B: carbon share (% of mass)	Column C: emission fac- tor (metric tons CO ₂ /bbl)
* * * * *			
Other Petroleum Products and Natural Gas Liquids			
* * * * *			
Ethane ³	0.0579	79.89	0.170
Ethylene ⁴	0.0492	85.63	0.154
Propane ³	0.0806	81.71	0.241
Propylene ³	0.0827	85.63	0.260
Butane ³	0.0928	82.66	0.281
Butylene ³	0.0972	85.63	0.305
Isobutane ³	0.0892	82.66	0.270
Isobutylene ³	0.0949	85.63	0.298
* * * * *			

³The density and emission factors for components of LPG determined at 60 degrees Fahrenheit and saturation pressure (LPGs other than ethylene).

⁴The density and emission factor for ethylene determined at 41 degrees Fahrenheit and saturation pressure.

Subpart NN—[AMENDED]

■ 95. Section 98.400 is amended by revising paragraphs (a) and (b) to read as follows:

§ 98.400 Definition of the source category.

* * * * *

(a) Natural gas liquids fractionators are installations that fractionate natural gas liquids (NGLs) into their constituent liquid products or mixtures of products (ethane, propane, normal butane, isobutane or pentanes plus) for supply to downstream facilities.

(b) Local Distribution Companies (LDCs) are companies that own or operate distribution pipelines, not interstate pipelines or intrastate pipelines, that physically deliver natural gas to end users and that are within a single state that are regulated as separate operating companies by State public utility commissions or that operate as independent municipally-owned distribution systems. LDCs do not include pipelines (both interstate and intrastate) delivering natural gas directly to major industrial users and farm taps upstream of the local distribution company inlet.

* * * * *

■ 96. Section 98.403 is amended by:

■ a. Revising the parameter “Fuel_h” to Equation NN-2 in paragraph (a)(2).

■ b. Revising paragraphs (b)(1) introductory text and (b)(2)(i).

■ c. Revising parameters “CO_{2k}” and “Fuel” to Equation NN-4 in paragraph (b)(2)(ii).

■ d. Revising paragraph (b)(3).

■ e. Revising paragraph (b)(4).

■ f. Revising paragraph (c)(2) introductory text.

■ g. Revising parameter “CO₂” of Equation NN-8 of paragraph (c)(2).

The revisions read as follows:

§ 98.403 Calculating GHG emissions.

(a) * * *

(2) * * *

* * * * *

Fuel_h = Total annual volume of product “h” supplied (volume per year, in Mscf for natural gas and bbl for NGLs).

* * * * *

(b) * * *

(1) For natural gas that is received for redelivery to downstream gas transmission pipelines and other local distribution companies, use Equation NN-3 of this section and the default values for the CO₂ emission factors found in Table NN-2 of this subpart. Alternatively, reporter-specific CO₂ emission factors may be used, provided they are developed using methods outlined in § 98.404.

* * * * *

(2)(i) For natural gas delivered to large end-users, use Equation NN-4 of this section and the default values for the CO₂ emission factors found in Table NN-2 of this subpart. A large end-user means any end-user facility receiving greater than or equal to 460,000 Mscf of

natural gas per year. If the LDC does not know the total quantity of gas delivered to the end-user facility based on readily available information in the LDCs possession, then large end-user means any single meter at an end-user facility to which the LDC delivers equal to or greater than 460,000 Mscf per year.

(ii) * * *

* * * * *

CO_{2k} = Annual CO₂ mass emissions that would result from the combustion or oxidation of natural gas delivered to each large end-user k, as defined in paragraph (b)(2)(i) of this section (metric tons).

Fuel = Total annual volume of natural gas supplied to each large end-user k, as defined in paragraph (b)(2)(i) of this section (Mscf per year).

* * * * *

(3) For the net change in natural gas stored on system by the LDC during the reporting year, use Equation NN-5a of this section. For natural gas that is received by means other than through the city gate, and is not otherwise accounted for by Equation NN-1 or NN-2 of this section, use Equation NN-5b of this section.

(i) For natural gas received by the LDC that is injected into on-system storage, and/or liquefied and stored, and for gas removed from storage and used for deliveries, use Equation NN-5a of this section and the default value for the CO₂ emission factors found in Table NN-2 of this subpart. Alternatively, a reporter-specific CO₂ emission factor may be

used, provided it is developed using methods outlined in § 98.404.

$$CO_{2i} = [Fuel_1 - Fuel_2] * EF \tag{Eq. NN-5a}$$

Where:

CO_{2i} = Annual CO₂ mass emissions that would result from the combustion or oxidation of the net change in natural gas stored on system by the LDC within the reporting year (metric tons).

Fuel₁ = Total annual volume of natural gas added to storage on-system or liquefied and stored in the reporting year (Mscf per year).

Fuel₂ = Total annual volume of natural gas that is removed from storage or

vaporized and removed from storage and used for deliveries to customers or other LDCs by the LDC within the reporting year (Mscf per year).

EF = Annual average CO₂ emission factor for natural gas placed into/removed from storage (MT CO₂/Mscf).

(ii) For natural gas received by the LDC that bypassed the city gate, use Equation NN-5b of this section. This includes natural gas received directly by

LDC systems from producers or natural gas processing plants from local production, received as a liquid and vaporized for delivery, or received from any other source that bypassed the city gate. Use the default value for the CO₂ emission factors found in Table NN-2 of this subpart. Alternatively, a reporter-specific CO₂ emission factor may be used, provided it is developed using methods outlined in § 98.404.

$$CO_{2n} = Fuel_z * EF_z \tag{Eq. NN-5b}$$

Where:

CO_{2n} = Annual CO₂ mass emissions that would result from the combustion or oxidation of natural gas received that bypassed the city gate and is not otherwise accounted for by Equation NN-1 or NN-2 of this section (metric tons).

Fuel_z = Total annual volume of natural gas received that was not otherwise

accounted for by Equation NN-1 or NN-2 of this section (natural gas from producers and natural gas processing plants from local production, or natural gas that was received as a liquid, vaporized and delivered, and any other source that bypassed the city gate). (Mscf per year)

EF_z = Fuel-specific CO₂ emission factor (MT CO₂/Mscf)

(4) Calculate the total CO₂ emissions that would result from the complete combustion or oxidation of the annual supply of natural gas to end-users that receive a supply less than 460,000 Mscf per year using Equation NN-6 of this section.

$$CO_2 = CO_{2i} + CO_{2n} - CO_{2j} - \sum CO_{2k} - CO_{2l} \tag{Eq. NN-6}$$

Where:

CO₂ = Annual CO₂ mass emissions that would result from the combustion or oxidation of natural gas delivered to LDC end-users not covered in paragraph (b)(2) of this section (metric tons).

CO_{2i} = Annual CO₂ mass emissions that would result from the combustion or oxidation of natural gas received at the city gate as calculated in paragraph (a)(1) or (2) of this section (metric tons).

CO_{2j} = Annual CO₂ mass emissions that would result from the combustion or oxidation of natural gas delivered to transmission pipelines or other LDCs as calculated in paragraph (b)(1) of this section (metric tons).

CO_{2k} = Annual CO₂ mass emissions that would result from the combustion or oxidation of natural gas delivered to each large end-user as calculated in paragraph (b)(2) of this section (metric tons).

CO_{2l} = Annual CO₂ mass emissions that would result from the combustion or oxidation of the net change in natural gas stored by the LDC within the reported year as calculated in paragraph (b)(3)(i) of this section (metric tons).

CO_{2n} = Annual CO₂ mass emissions that would result from the combustion or oxidation of natural gas that was received by the LDC directly from sources bypassing the city gate, and is not otherwise accounted for in Equation

NN-1 or NN-2 of this section, as calculated in paragraph (b)(3)(ii) of this section (metric tons).

(c) * * *

(2) Calculate the total CO₂ equivalent emissions that would result from the combustion or oxidation of fractionated NGLs supplied less the quantity received from other fractionators using Equation NN-8 of this section.

* * * * *

CO₂ = Annual CO₂ mass emissions that would result from the combustion or oxidation of fractionated NGLs delivered to customers or on behalf of customers less the quantity received from other fractionators (metric tons).

* * * * *

■ 97. Section 98.404 is amended by:

- a. Revising paragraphs (a)(5) introductory text, (a)(7), (a)(8) introductory text, and (a)(8)(ii).
- b. Adding paragraph (a)(8)(iii).
- c. Revising paragraphs (a)(9), (c)(2), and (d)(1) and (2).
- d. Adding paragraph (d)(3).

The revisions and additions read as follows:

§ 98.404 Monitoring and QA/QC requirements.

(a) * * *

(5) For an LDC using Equation NN-1 or NN-2 of this subpart, the point(s) of measurement for the natural gas volume received shall be the LDC city gate meter(s).

* * * * *

(7) An LDC using Equation NN-4 of this subpart shall measure natural gas at the large end-user's meter(s). Where a large end-user is known to have more than one meter located at their facility, based on readily available information in the LDCs possession, the reporter shall measure the natural gas at each meter and sum the annual volume delivered to all meters located at the end-user's facility to determine the total volume delivered to the large end-user. Otherwise, the reporter shall consider the total annual volume delivered through each single meter at a single particular location to be the volume delivered to an individual large end-user.

(8) An LDC using Equation NN-5a and/or NN-5b of this subpart shall measure natural gas as follows:

* * * * *

(ii) Fuel₂ shall be measured at the meters used for measuring on-system storage withdrawals and/or LNG vaporization injection.

(iii) Fuel_z shall be measured using established business practices.

(9) An LDC shall measure all natural gas under the following standard industry temperature and pressure conditions: Cubic foot of gas at a temperature of 60 degrees Fahrenheit and at an absolute pressure of one atmosphere.

* * * * *

(c) * * *

(2) When a reporter used the default EF provided in this section to calculate Equation NN-2, NN-3, NN-4, NN-5a, NN-5b, or NN-7 of this subpart, the appropriate value shall be taken from Table NN-2 of this subpart.

* * * * *

(d) * * *

(1) Equipment used to measure quantities in Equations NN-1, NN-2, NN-5a and NN-5b of this subpart shall be calibrated prior to its first use for reporting under this subpart, using a suitable standard method published by a consensus based standards organization or according to the equipment manufacturer's directions.

(2) Equipment used to measure quantities in Equations NN-1, NN-2, NN-5a, and NN-5b of this subpart shall be recalibrated at the frequency specified by the standard method used or by the manufacturer's directions.

(3) Equipment used to measure quantities in Equations NN-3 and NN-4 of this subpart shall be recalibrated at the frequency commonly used within the industry.

§ 98.405 [Amended]

■ 98. Section 98.405 is amended by removing and reserving paragraph (c)(3).

■ 99. Section 98.406 is amended by:

- a. Revising paragraph (a)(4) and (7).
- b. Revising paragraphs (b)(2) and (3).
- c. Removing and reserving paragraph (b)(4).
- d. Revising paragraphs (b)(5), (b)(7), (b)(9), and (b)(12) introductory text.

The revisions read as follows:

§ 98.406 Data reporting requirements.

(a) * * *

(4) Annual quantities (in barrels) of y-grade, o-grade, and other bulk NGLs:

- (i) Received.
- (ii) Supplied to downstream users that are not fractionated by the reporter.

* * * * *

(7) Annual CO₂ mass emissions (metric tons) that would result from the combustion or oxidation of fractionated NGLs supplied less the quantity received from other fractionators, calculated in accordance with § 98.403(c)(2). If the calculated value is negative, the reporter shall report the value as zero.

* * * * *

(b) * * *

(2) Annual volume in Mscf of natural gas placed into storage or liquefied and stored (Fuel₁ in Equation NN-5a).

(3) Annual volume in Mscf of natural gas withdrawn from on-system storage and annual volume in Mscf of vaporized liquefied natural gas (LNG) withdrawn from storage for delivery on the distribution system (Fuel₂ in Equation NN-5a).

(5) Annual volume in Mscf of natural gas that bypassed the city gate(s) and was supplied through the LDC distribution system. This includes natural gas from producers and natural gas processing plants from local production, or natural gas that was vaporized upon receipt and delivered, and any other source that bypassed the city gate (Fuel_z in Equation NN-5b).

* * * * *

(7) Annual volume in Mscf of natural gas delivered by the LDC to each large end-user as defined in § 98.403(b)(2)(i) of this section.

* * * * *

(9) Annual CO₂ emissions (metric tons) that would result from the complete combustion or oxidation of the annual supply of natural gas to end-users registering less than 460,000 Mscf, calculated in accordance with § 98.403(b)(4). If the calculated value is negative, the reporter shall report the value as zero.

* * * * *

(12) The customer name, address, and meter number of each large end-user reported in paragraph (b)(7) of this section. Additionally, report whether the quantity of natural gas reported in paragraph (b)(7) of this section is the total quantity delivered to a large end-user's facility, or the quantity delivered to a specific meter located at the facility.

* * * * *

■ 100. Section 98.407 is amended by revising the introductory text to read as follows:

§ 98.407 Records that must be retained.

In addition to the information required by § 98.3(g), the reporter shall retain the following records:

* * * * *

■ 101. Table NN-1 to subpart NN is revised to read as follows:

TABLE NN-1 TO SUBPART NN OF PART 98—DEFAULT FACTORS FOR CALCULATION METHODOLOGY 1 OF THIS SUBPART

Fuel	Default higher heating value ¹	Default CO ₂ emission factor (kg CO ₂ /MMBtu)
Natural Gas	1.026 MMBtu/Mscf.	53.06
Propane	3.84 MMBtu/bbl.	62.87
Normal butane.	4.34 MMBtu/bbl.	64.77
Ethane	2.85 MMBtu/bbl.	59.60
Isobutane	4.16 MMBtu/bbl.	64.94
Pentanes plus.	4.62 MMBtu/bbl.	70.02

¹ Conditions for higher heating values presented in MMBtu/bbl are 60°F and saturation pressure.

■ 102. Table NN-1 to subpart NN is revised to read as follows:

TABLE NN-2 TO SUBPART NN OF PART 98—DEFAULT VALUES FOR CALCULATION METHODOLOGY 2 OF THIS SUBPART

Fuel	Unit	Default CO ₂ emission value (MT CO ₂ /Unit) ¹
Natural Gas	Mscf	0.0544
Propane	Barrel	0.241
Normal butane.	Barrel	0.281
Ethane	Barrel	0.170
Isobutane	Barrel	0.270
Pentanes plus.	Barrel	0.324

¹ Conditions for emission value presented in MT CO₂/bbl are 60°F and saturation pressure.

Subpart PP—[AMENDED]

■ 103. Section 98.423 is amended by revising paragraph (a)(3)(i) introductory text to read as follows:

§ 98.423 Calculating CO₂ supply.

(a) * * *

(3) * * *

(i) For facilities with production process units or production wells that capture or extract a CO₂ stream and either measure it after segregation or do not segregate the flow, calculate the total CO₂ supplied in accordance with Equation PP-3a in paragraph (a)(3).

* * * * *

■ 104. Section 98.426 is amended by revising paragraphs (b)(4)(i) and (ii) and (f)(10) and (11) to read as follows:

§ 98.426 Data reporting requirements.

(b)
(4)

(i) Quarterly density of the CO2 stream in metric tons per standard cubic meter if you report the concentration of the CO2 stream in paragraph (b)(3) of this section in weight percent.

(ii) Quarterly density of CO2 in metric tons per standard cubic meter if you report the concentration of the CO2 stream in paragraph (b)(3) of this section in volume percent.

(f)

(10) Injection of carbon dioxide for enhanced oil and natural gas recovery that is covered by subpart UU of this part.

(11) Geologic sequestration of carbon dioxide that is covered by subpart RR of this part.

*

Subpart QQ—[AMENDED]

105. Section 98.433 is amended by revising the parameter "St" of Equation QQ-1 in paragraph (a) and Equation QQ-2 in paragraph (b) to read as follows:

§ 98.433 Calculating GHG contained in pre-charged equipment or closed-cell foams.

(a)

St = Mass of fluorinated GHG per unit of equipment type t or foam type t (charge per piece of equipment, kg) or density of fluorinated GHG in foam (charge per cubic foot of foam, kg per cubic foot).

(b)

St = Mass in CO2e of the fluorinated GHGs per unit of equipment type t or foam type t (charge per piece of equipment, kg) or density of fluorinated GHG in foam (CO2e per cubic foot of foam, kg CO2e per cubic foot).

*

106. Section 98.434 is amended by revising paragraph (b) to read as follows:

§ 98.434 Monitoring and QA/QC requirements.

*

(b) The inputs to the annual submission must be reviewed against the import or export transaction records to ensure that the information submitted to EPA is being accurately transcribed as the correct chemical or blend in the correct pre-charged equipment or closed-cell foam in the correct quantities and units.

107. Section 98.436 is amended by:

a. Revising paragraphs (a)(3), (a)(4), (a)(6)(ii), (a)(6)(iii), (b)(3), (b)(4), and (b)(6)(ii) and (iii).

b. Removing and reserving paragraphs (a)(5), (a)(6)(iv), (b)(5), and (b)(6)(iv).

The revisions read as follows:

§ 98.436 Data reporting requirements.

(a)

(3) For closed-cell foams that are imported inside of equipment, the identity of the fluorinated GHG contained in the foam, the mass of the fluorinated GHG contained in the foam in each piece of equipment, and the number of pieces of equipment imported with each unique combination of mass and identity of fluorinated GHG within the closed-cell foams.

(4) For closed cell-foams that are not imported inside of equipment, the identity of the fluorinated GHG in the foam, the density of the fluorinated GHG in the foam (kg fluorinated GHG/cubic foot), and the volume of foam imported (cubic feet) for each type of closed-cell foam with a unique combination of fluorinated GHG density and identity.

*

(6)

(ii) For closed-cell foams that are imported inside of equipment, the mass of the fluorinated GHGs in CO2e contained in the foam in each piece of equipment and the number of pieces of equipment imported for each equipment type.

(iii) For closed-cell foams that are not imported inside of equipment, the density in CO2e of the fluorinated GHGs in the foam (kg CO2e/cubic foot) and the volume of foam imported (cubic feet) for each type of closed-cell foam.

*

(b)

(3) For closed-cell foams that are exported inside of equipment, the identity of the fluorinated GHG contained in the foam in each piece of equipment, the mass of the fluorinated GHG contained in the foam in each piece of equipment, and the number of pieces of equipment exported with each unique combination of mass and identity of fluorinated GHG within the closed-cell foams.

(4) For closed-cell foams that are not exported inside of equipment, the identity of the fluorinated GHG in the foam, the density of the fluorinated GHG in the foam (kg fluorinated GHG/cubic foot), and the volume of foam exported (cubic feet) for each type of closed-cell foam with a unique combination of fluorinated GHG density and identity.

*

(6)

(ii) For closed-cell foams that are exported inside of equipment, the mass of the fluorinated GHGs in CO2e contained in the foam in each piece of equipment and the number of pieces of equipment imported for each equipment type.

(iii) For closed-cell foams that are not exported inside of equipment, the density in CO2e of the fluorinated GHGs in the foam (kg CO2e/cubic foot) and the volume of foam imported (cubic feet) for each type of closed-cell foam.

*

108. Section 98.438 is amended by revising the definitions for "Closed-cell foam" and "Pre-charged electrical equipment component" to read as follows:

§ 98.438 Definitions.

*

Closed-cell foam means any foam product, excluding packaging foam, that is constructed with a closed-cell structure and a blowing agent containing a fluorinated GHG. Closed-cell foams include but are not limited to polyurethane (PU) foam contained in equipment, PU continuous and discontinuous panel foam, PU one component foam, PU spray foam, extruded polystyrene (XPS) boardstock foam, and XPS sheet foam. Packaging foam means foam used exclusively during shipment or storage to temporarily enclose items.

*

Pre-charged electrical equipment component means any portion of electrical equipment that is charged with a fluorinated greenhouse gas prior to sale or distribution or offer for sale or distribution in interstate commerce.

Subpart RR—[AMENDED]

109. Section 98.443 is amended by:

a. Revising the parameter "Sr,p" to Equation RR-2 in paragraph (b)(2).

b. Revising the last sentence of paragraph (d)(3) introductory text.

c. Revising the parameter "CO2FI" of Equation RR-12 in paragraph (f)(2).

The revisions read as follows:

§ 98.443 Calculating CO2 geologic sequestration.

*

(b)

(2)

*

Sr,p = Quarterly volume of contents in containers r redelivered to another facility without being injected into your well in quarter p (standard cubic meters).

*

(d)

(3) * * * The considerations you intend to use to calculate CO₂ from produced fluids for the mass balance equation must be described in your approved MRV plan in accordance with § 98.448(a)(5).

* * * * *

(f) * * *

(2) * * *

* * * * *

CO_{2FI} = Total annual CO₂ mass emitted (metric tons) from equipment leaks and vented emissions of CO₂ from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead, for which a calculation procedure is provided in subpart W of this part.

■ 110. Section 98.446 is amended by revising paragraph (b)(5) to read as follows:

§ 98.446 Data reporting requirements.

* * * * *

(b) * * *

(5) The standard or method used to calculate each value in paragraphs (b)(1), (b)(2), and (b)(3) of this section.

* * * * *

Subpart SS—[AMENDED]

■ 111. Section 98.453 is amended by:

■ a. Revising paragraph (d).

■ b. Revising paragraph (h).

■ c. Revising the parameter “MF” of Equation SS–6 in paragraph (i).

The revisions read as follows:

§ 98.453 Calculating GHG emissions.

* * * * *

(d) Estimate the mass of SF₆ or PFCs disbursed to customers in new equipment or cylinders over the period p by monitoring the mass flow of the SF₆ or PFCs into the new equipment or cylinders using a flowmeter, or by weighing containers before and after gas from containers is used to fill equipment or cylinders, or by using the nameplate capacity of the equipment.

* * * * *

(h) If the mass of SF₆ or the PFC disbursed to customers in new equipment or cylinders over the period

p is determined by using the nameplate capacity, or by using the nameplate capacity of the equipment and calculating the partial shipping charge, use the methods in either paragraph (h)(1) or (h)(2) of this section.

(1) Determine the equipment’s actual nameplate capacity, by measuring the nameplate capacities of a representative sample of each make and model and calculating the mean value for each make and model as specified at § 98.454(f).

(2) If equipment is shipped with a partial charge, calculate the partial shipping charge by multiplying the nameplate capacity of the equipment by the ratio of the densities of the partial charge to the full charge.

(i) * * *

* * * * *

MF = The total annual mass of the SF₆ or PFCs, in pounds, used to fill equipment during equipment installation at electric transmission or distribution facilities.

* * * * *

■ 112. Section 98.456 is amended by revising paragraphs (m), (o), and (p) to read as follows:

§ 98.456 Data reporting requirements.

* * * * *

(m) The values for EF_{ci} of Equation SS–5 of this subpart for each hose and valve combination and the associated valve fitting sizes and hose diameters.

* * * * *

(o) If the mass of SF₆ or the PFC disbursed to customers in new equipment over the period p is determined according to the methods required in § 98.453(h), report the mean value of nameplate capacity in pounds for each make, model, and group of conditions.

(p) If the mass of SF₆ or the PFC disbursed to customers in new equipment over the period p is determined according to the methods required in § 98.453(h), report the number of samples and the upper and lower bounds on the 95 percent confidence interval for each make, model, and group of conditions.

* * * * *

Subpart TT—[AMENDED]

■ 113. Section 98.460 is amended by revising paragraph (c)(2)(xiii) to read as follows:

§ 98.460 Definition of the source category.

* * * * *

(c) * * *

(2) * * *

(xiii) Other waste material that has a DOC value of 0.3 weight percent (on a wet basis) or less. DOC value must be determined using a 60-day anaerobic biodegradation test procedure identified in § 98.464(b)(4)(i).

* * * * *

■ 114. Section 98.463 is amended by:

■ a. Revising the parameter “DOC_F” of Equation TT–1 in paragraph (a)(1).

■ b. Removing the parameter “F_x” of Equation TT–1 and adding in its place the parameter “F”.

■ c. Revising Equation TT–4b in paragraph (a)(2)(ii)(C).

■ d. Revising the parameter “OX” of Equation TT–6 in paragraph (b)(1).

The revisions read as follows:

§ 98.463 Calculating GHG emissions.

(a) * * *

(1) * * *

* * * * *

DOC_F = Fraction of DOC dissimilated (fraction); use the default value of 0.5. If measured values of DOC are available using the 60-day anaerobic biodegradation test procedure identified in § 98.464(b)(4)(i), use a default value of 1.0.

* * * * *

F = Fraction by volume of CH₄ in landfill gas (fraction, dry basis, corrected to 0% oxygen). If you have a gas collection system, use the annual average CH₄ concentration from measurement data for the current reporting year; otherwise, use the default value of 0.5.

* * * * *

(2) * * *

(ii) * * *

(C) * * *

* * * * *

$$W_x = \frac{WIP - \sum_{n=1}^{NYrData} W_{meas,n}}{(YrLast - YrOpen + 1 - NYrData)}$$

(Eq. TT-4b)

* * * * *

(b) * * *

(1) * * *

* * * * *

OX = Oxidation fraction from Table HH–4 of subpart HH of this part.

* * * * *

■ 115. Section 98.464 is amended by:

■ a. Revising paragraph (b) introductory text.

■ b. Revising Equation TT–7 in paragraph (b)(4)(i)(E).

■ c. Removing the parameters “DOC_F”, “MCD_{control}”, and “MC_{control}” of Equation TT-7 in paragraph (b)(4)(i)(E).

■ d. Revising paragraph (c).

The revisions read as follows:

$$DOC_x = \frac{MCD_{sample,x}}{M_{sample,x}}$$

Where:

DOC_X = Degradable organic content of the waste stream in Year X (weight fraction, wet basis)

MCD_{sample,x} = Mass of carbon degraded in the waste stream sample in Year X as determined in paragraph (b)(4)(i)(C) of this section [milligrams (mg)].

M_{sample,x} = Mass of waste stream sample used in the anaerobic degradation test in Year X (mg, wet basis).

* * * * *

(c) For each waste stream that was historically managed in the landfill for which you choose to determine volatile solids concentration and/or a waste stream-specific DOC_X, you must determine volatile solids concentration or DOC_X of the waste stream as initially placed in the landfill using the methods specified in paragraph (c)(1) or (2) of this section, as applicable.

(1) If you can identify a similar waste stream to the waste stream that was historically managed in the landfill, you must determine the volatile solids concentration or DOC_X of the similar waste stream using the applicable procedures in paragraphs (b)(1) through (4) of this section.

(2) If you cannot identify a similar waste stream to the waste stream that was historically managed in the landfill, you may determine the volatile solids concentration or DOC_X of the historically managed waste stream using process knowledge. You must document the basis for the volatile solids concentration or DOC_X value as determined through process knowledge.

* * * * *

■ 116. Section 98.466 is amended by:

■ a. Revising paragraph (b)(1).

■ b. Adding paragraph (b)(5).

■ c. Revising paragraph (c) introductory text.

■ d. Removing and reserving paragraph (c)(1).

■ e. Revising paragraphs (c)(2), (c)(3) introductory text, and (c)(4) introductory text.

■ f. Adding paragraph (c)(5).

■ g. Revising paragraph (d)(3).

■ h. Revising paragraph (h).

§ 98.464 Monitoring and QA/QC requirements.

* * * * *

(b) For each waste stream placed in the landfill during the reporting year for which you choose to determine volatile solids concentration and/or a waste stream-specific DOC_X, you must collect

and test a representative sample of that waste stream using the methods specified in paragraphs (b)(1) through (b)(4) of this section, as applicable.

* * * * *

(4) * * *

(i) * * *

(E) * * *

(Eq. TT-7)

The revisions and additions read as follows:

§ 98.466 Data reporting requirements.

* * * * *

(b) * * *

(1) The number of waste streams (including “Other Industrial Solid Waste (not otherwise listed)” and “Inerts”) for which Equation TT-1 of this subpart is used to calculate modeled CH₄ generation.

* * * * *

(5) For each waste stream, the decay rate (k) value used in the calculations.

(c) Report the following historical waste information:

* * * * *

(2) For each waste stream identified in paragraph (b) of this section, the method(s) for estimating historical waste disposal quantities and the range of years for which each method applies.

(3) For each waste stream identified in paragraph (b) of this section for which Equation TT-2 of this subpart is used, provide:

* * * * *

(4) If Equation TT-4a of this subpart is used, provide:

* * * * *

(5) If Equation TT-4b of this subpart is used, provide:

(i) WIP (i.e., the quantity of waste in-place at the start of the reporting year from design drawings or engineering estimates (metric tons) or, for closed landfills for which waste in-place quantities are not available, the landfill’s design capacity).

(ii) The cumulative quantity of waste placed in the landfill for the years for which disposal quantities are available from company record or from Equation TT-3 of this part.

(iii) YrLast.

(iv) YrOpen.

(v) NYrData.

(d) * * *

(3) For each waste stream, the degradable organic carbon (DOC_X) value (mass fraction) for the specified year and an indication as to whether this was

the default value from Table TT-1 to this subpart, a measured value using a 60-day anaerobic biodegradation test as specified in § 98.464(b)(4)(i), or a value based on total and volatile solids measurements as specified in § 98.464(b)(4)(ii). If DOC_X was determined by a 60-day anaerobic biodegradation test, specify the test method used.

* * * * *

(h) For landfills with gas collection systems, in addition to the reporting requirements in paragraphs (a) through (f) of this section, provide:

(1) The annual methane generation, adjusted for oxidation, calculated using Equation TT-6 of this subpart, reported in metric tons CH₄.

(2) The oxidation factor used in Equation TT-6 of this subpart.

(3) All information required under 40 CFR 98.346(i)(1) through (7) and 40 CFR 98.346(i)(9) through (12).

■ 117. Section 98.467 is revised to read as follows:

§ 98.467 Records that must be retained.

In addition to the information required by § 98.3(g), you must retain the calibration records for all monitoring equipment, including the method or manufacturer’s specification used for calibration, and all measurement data used for the purposes of paragraphs § 98.460(c)(2)(xii) or (xiii) or used to determine waste stream-specific DOC_X values for use in Equation TT-1 of this subpart.

■ 118. Section 98.468 is amended by adding a definition of “Industrial sludge” in alphabetical order to read as follows:

§ 98.468 Definitions.

* * * * *

Industrial sludge means the residual, semi-solid material left from industrial wastewater treatment processes or wet air pollution control devices (e.g., wet scrubbers). *Industrial sludge* includes underflow material collected in primary or secondary clarifiers, settling basins,

or precipitation tanks as well as dredged materials from wastewater tanks or impoundments. *Industrial sludge* also includes the semi-solid materials remaining after these materials are

dewatered via a belt process, centrifuge, or similar dewatering process.

* * * * *

- 119. Table TT-1 to subpart TT is amended by:
- a. Revising the first four entries.
- b. Adding a new entry following “Construction and Demolition”.

TABLE TT-1 TO SUBPART TT—DEFAULT DOC AND DECAY RATE VALUES FOR INDUSTRIAL WASTE LANDFILLS

Industry/waste type	DOC (weight fraction, wet basis)	k [dry climate ^a] (yr ⁻¹)	k [moderate climate ^a] (yr ⁻¹)	k [wet climate ^a] (yr ⁻¹)
Food Processing (other than industrial sludge)	0.22	0.06	0.12	0.18
Pulp and Paper (other than industrial sludge)	0.20	0.02	0.03	0.04
Wood and Wood Product (other than industrial sludge)	0.43	0.02	0.03	0.04
Construction and Demolition	0.08	0.02	0.03	0.04
Industrial Sludge	0.09	0.02	0.04	0.06

* * * * *

^aThe applicable climate classification is determined based on the annual rainfall plus the recirculated leachate application rate. Recirculated leachate application rate (in inches/year) is the total volume of leachate recirculated from company records or engineering estimates and applied to the landfill divided by the area of the portion of the landfill containing waste [with appropriate unit conversions].

- (1) Dry climate = precipitation plus recirculated leachate less than 20 inches/year
- (2) Moderate climate = precipitation plus recirculated leachate from 20 to 40 inches/year (inclusive)
- (3) Wet climate = precipitation plus recirculated leachate greater than 40 inches/year

Alternatively, landfills that use leachate recirculation can elect to use the k value for wet climate rather than calculating the recirculated leachate rate.

Subpart UU—[AMENDED]

■ 120. Section 98.473 is amended by:

- a. Revising the parameter “D” of Equation UU-2 in paragraph (a)(2).
- b. Revising the parameter “S_{r,p}” of Equation UU-2 in paragraph (b)(2).

The revisions read as follows:

§ 98.473 Calculating CO₂ received.

- (a) * * *
- (2) * * *

* * * * *

D = Density of CO₂ at standard conditions (metric tons per standard cubic meter):
0.0018682.

* * * * *

- (b) * * *
- (2) * * *

* * * * *

S_{r,p} = Quarterly volume of contents in containers r that is redelivered to another facility without being injected into your well in quarter p (standard cubic meters).

* * * * *

■ 121. Section 98.476 is amended by revising paragraph (b)(5) and adding paragraph (e) to read as follows:

§ 98.476 Data reporting requirements.

* * * * *

(b) * * *

(5) The standard or method used to calculate each value in paragraphs (b)(1), (b)(2), and (b)(3) of this section.

* * * * *

(e) Report the following:

(1) Whether the facility received a Research and Development project exemption from reporting under 40 CFR part 98, subpart RR, for this reporting year. If you received an exemption, report the start and end dates of the exemption approved by EPA.

(2) Whether the facility includes a well or group of wells where a CO₂ stream was injected into subsurface geologic formations to enhance the

recovery of oil during this reporting year.

(3) Whether the facility includes a well or group of wells where a CO₂ stream was injected into subsurface geologic formations to enhance the recovery of natural gas during this reporting year.

(4) Whether the facility includes a well or group of wells where a CO₂ stream was injected into subsurface geologic formations for acid gas disposal during this reporting year.

(5) Whether the facility includes a well or group of wells where a CO₂ stream was injected for a purpose other than those listed in paragraphs (e)(1) through (4) of this section. If you injected CO₂ for another purpose, report the purpose of the injection.

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