FEDERAL REGISTER

Vol. 79 Thursday,
No. 137 July 17, 2014

Part IV

Environmental Protection Agency

40 CFR Part 60
Standards of Performance for Municipal Solid Waste Landfills; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[EPA–HQ–OAR–2003–0215; FRL–9912–12–OAR]

RIN 2060–AM08

Standards of Performance for Municipal Solid Waste Landfills

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing a new subpart, 40 CFR part 60, subpart XXX that updates the Standards of Performance for Municipal Solid Waste Landfills. Under section 111 of the Clean Air Act, the EPA must review, and, if appropriate, revise standards of performance at least every 8 years. The EPA's review of the standards for municipal solid waste landfills applies to landfills that commence construction, reconstruction, or modification after July 17, 2014. The proposed standards reflect changes to the population of landfills and an analysis of the timing and methods for reducing emissions. The proposed standards also address other regulatory issues including the definition of landfill gas treatment systems, among other topics. The new subpart will reduce emissions of landfill gas, which contains both nonmethane organic compounds and methane. These avoided emissions will improve air quality and reduce public health and welfare effects associated with exposure to landfill gas emissions.

DATES: *Comments.* Comments must be received on or before September 15, 2014.

Public Hearing. If anyone contacts the EPA requesting a public hearing by July 22, 2014, we will hold a public hearing on August 12, 2014, in Washington, DC at the William Jefferson Clinton East Building, Room 1153, 1201 Constitution Avenue NW., Washington, DC 20004. The public hearing will convene at 9:00 a.m. and end at 6:00 p.m. (Eastern Standard Time). There will be a lunch break from 12:00 p.m. to 1:00 p.m. Please contact Ms. Virginia Hunt at (919) 541–0832 or at *hunt.virginia@epa.gov* to register to speak at one of the hearings. The last day to pre-register in advance to speak at the hearings will be Friday August 8, 2014. Additionally, requests to speak will be taken the day of the hearing at the hearing registration desk, although preferences on speaking times may not be able to be fulfilled. If you require the service of a translator or special accommodations such as audio description, please let us know at the time of registration.

If no one contacts the EPA requesting a public hearing to be held concerning this proposed rule by July 22, 2014, a public hearing will not take place. If a hearing is held, it will provide interested parties the opportunity to present data, views or arguments concerning the proposed action. The EPA will make every effort to accommodate all speakers who arrive and register. Because this hearing, if held, will be at U.S. government facilities, individuals planning to attend the hearing should be prepared to show valid picture identification to the security staff in order to gain access to the meeting room. In addition, you will need to obtain a property pass for any personal belongings you bring with you. Upon leaving the building, you will be required to return this property pass to the security desk. No large signs will be allowed in the building, cameras may only be used outside of the building and demonstrations will not be allowed on federal property for security reasons.

The EPA may ask clarifying questions during the oral presentations, but will not respond to the presentations at that time. Written statements and supporting information submitted during the comment period will be considered with the same weight as oral comments and supporting information presented at the public hearing. Commenters should notify Ms. Hunt if they will need specific equipment, or if there are other special needs related to providing comments at the hearings. Verbatim transcripts of the hearing and written statements will be included in the docket for the rulemaking. The EPA will make every effort to follow the schedule as closely as possible on the day of the hearing; however, please plan for the hearing to run either ahead of schedule or behind schedule. Information regarding the hearing (including information as to whether or not one will be held) will be available at: *http://www.epa.gov/ttnatw01/landfill/landflpg.html.*

ADDRESSES: Submit your comments, identified by Docket ID Number EPA–HQ–OAR–2003–0215, by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the online instructions for submitting comments.
- *Email: A-and-R-docket@epa.gov.* Include docket ID No. EPA–HQ–OAR–2003–0215 in the subject line of the message.
- *Fax:* (202) 566–9744. Attention Docket ID No. EPA–HQ–OAR–2003–0215.
- *Mail:* Environmental Protection Agency, EPA Docket Center (EPA/DC), Mailcode 28221T, Attention Docket ID No. EPA–HQ–OAR–2003–0215, 1200 Pennsylvania Avenue NW., Washington, DC 20460. Please include a total of two copies. In addition, please mail a copy of your comments on the information collection provisions to the Office of Information and Regulatory Affairs, Office of Management and Budget, Attn: Desk Officer for EPA, 725 17th Street NW., Washington, DC 20503.
- *Hand/Courier Delivery:* EPA Docket Center, Room 3334, EPA WJC West Building, 1301 Constitution Avenue NW., Washington, DC 20004. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OAR–2003–0215. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be confidential business information (CBI) or other information whose disclosure is restricted by statute.

Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or email. Send or deliver information identified as CBI to only the mail or hand/courier delivery address listed above, attention: Mr. Roberto Morales, OAQPS Document Control Officer (Room C404–02), Office of Air Quality Planning and Standards, U.S. EPA, Research Triangle Park, NC 27711, Attention Docket ID No. EPA–HQ–OAR–2003–0215. The *http://www.regulations.gov* Web site is an ''anonymous access'' system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *http://www.regulations.gov,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact

you for clarification, the EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: 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., 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 West Building, Room B102, 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 INFORMATION CONTACT: For information concerning this proposal, contact Ms. Hillary Ward, Fuels and Incineration Group, Sector Policies and Programs Division, Office of Air Quality Planning and Standards (E143–05), Environmental Protection Agency, Research Triangle Park, NC 27711; telephone number: (919) 541–3154; fax number: (919) 541–0246; email address: *ward.hillary@epa.gov.*

SUPPLEMENTARY INFORMATION:

World Wide Web (WWW). In addition to being available in the docket, an electronic copy of proposed subpart XXX for 40 CFR part 60 is available on the Technology Transfer Network (TTN) Web site. Following signature, the EPA will post a copy of the proposed subpart XXX on the TTN's policy and guidance page for newly proposed or promulgated rules at *http://www.epa.gov/ttnatw01/landfill/landflpg.html.* The TTN provides information and technology exchange in various areas of air pollution control.

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

ANPRM Advance notice of proposed rulemaking
ANSI American National Standards Institute
BMP Best management practice
BSER Best system of emission reduction
CAA Clean Air Act
CBI Confidential business information
CDX Central Data Exchange
CEDRI Compliance and Emissions Data Reporting Interface
CFR Code of Federal Regulations
CO_2 Carbon dioxide
CO_2e Carbon dioxide equivalent
CRDS Cavity ringdown spectroscopy
DOC Degradable organic carbon
EPA Environmental Protection Agency
ERT Electronic Reporting Tool
FLIR Forward-looking infrared
FTIR Fourier Transform Infrared
GCCS Gas collection and control system
GHGRP Greenhouse Gas Reporting Program
GWP Global warming potential
HAP Hazardous air pollutants
ICR Information collection request
IRIS Integrated Risk Information System
lb/MMBtu Pounds per million British thermal unit
LFG Landfill gas
LFGCost Landfill Gas Energy Cost Model
LMOP Landfill Methane Outreach Program
m^3 Cubic meters
Mg Megagram
Mg/yr Megagram per year
MSW Municipal solid waste
MW Megawatt
MWh Megawatt hour
NAICS North American Industry Classification System
NMOC Nonmethane organic compound
NSPS New source performance standards
NSR New Source Review
NTTAA National Technology Transfer and Advancement Act
OAQPS Office of Air Quality Planning and Standards
OMB Office of Management & Budget
ppm Parts per million
ppmvd Parts per million by dry volume
RCRA Resource Conservation and Recovery Act
RFA Regulatory Flexibility Act
RIA Regulatory impacts analysis
RPM Radial plume mapping
SBAR Small Business Advocacy Review
SER Small entity representative
SISNOSE Significant impact on a substantial number of small entities
SSM Startup, shutdown and malfunction
TDL Tunable diode laser
tpy Tons per year
TTN Technology Transfer Network
USG U.S. government
VCS Voluntary consensus standard
VOC Volatile organic compound
WWW World Wide Web

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

I. Executive Summary

A. Purpose of Regulatory Action

The EPA has conducted an initial review of the Standards of Performance for Municipal Solid Waste Landfills (landfill new source performance standards or landfills NSPS). The EPA's review is ongoing and will be informed by, among other matters, comments received on today's proposed action. Based on its initial review, the EPA is proposing a number of changes to the existing landfills NSPS. In order to avoid possible confusion regarding which MSW landfills would actually be subject to any revised, or new, requirements, the EPA is establishing a new subpart XXX (40 CFR part 60, subpart XXX) rather than merely updating existing subpart WWW (40 CFR part 60, subpart WWW). The requirements in new subpart XXX will apply to MSW landfills for which construction, modification, or reconstruction is commenced on or after July 17, 2014. The requirements in subpart WWW will continue to apply to MSW landfills on which construction, modification or reconstruction was commenced on or after May 30, 1991 and before July 17, 2014. Note that this preamble uses both of the terms ''MSW landfills'' and ''landfills'' to refer to MSW landfills.

1. Need for Regulatory Action

Several factors led to today's proposed action. First, section 111 of the Clean Air Act (CAA) (42 U.S.C. § 7411) requires the EPA to review standards of performance at least every 8 years and, if appropriate, revise the standards to reflect improvements in methods for reducing emissions. Second, a mandatory duty lawsuit was filed against EPA for failure to review the NSPS by the statutorily required deadline. Under a consent decree resolving that lawsuit, the EPA agreed to propose a review and take final action on the proposal. Third, the EPA has concluded that landfill owners and operators, as well as regulators, need clarification regarding issues that have arisen during implementation of the existing standards. Implementation issues include the definition of landfill gas treatment, among other topics.

2. Legal Authority

CAA section 111(b)(1)(B) (42 U.S.C. § 7411(b)(1)(B)) requires the EPA to ''at least every 8 years review and, if appropriate, revise'' new source performance standards. CAA section 111(a)(1) (42 U.S.C. § 7411(a)(1)) provides that performance standards are to ''reflect the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.'' We refer to this level of control as the best system of emission reduction or ''BSER.''

As indicated above, the EPA has decided to propose its review of the landfill NSPS in a new subpart rather than update existing requirements in 40 CFR part 60, subpart WWW. The EPA believes that either approach is legally permissible.[1] Proposed subpart XXX would appear in 40 CFR part 60 and would apply to landfills that commence construction, reconstruction, or modification on or after July 17, 2014.

B. Summary of Major Provisions

The proposed new subpart retains the same design capacity threshold but reduces the non-methane organic compounds (NMOC) emission threshold at which MSW landfills must install controls. The new subpart also resolves or clarifies issues that the EPA and stakeholders identified during implementation of the current landfills NSPS.

Thresholds for installing controls. Under the current NSPS, an MSW landfill that has a design capacity of 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) must install and start up a gas collection control system within 30 months after landfill gas emissions reach or exceed a level of 50 Mg NMOC per year. (A megagram is also known as a metric ton, which is equal to 1.1 U.S. short tons or about 2,205 pounds.) The current NSPS is referred to as the ''baseline'' in this document. Proposed subpart XXX retains the same design capacity threshold as the baseline, but reduces the NMOC emission threshold to 40 Mg/yr. The owner or operator of a landfill may control the gas by routing it to a non-enclosed flare, an enclosed combustion device, or a treatment system that processes the collected gas for subsequent sale or beneficial use.

Landfill gas treatment. The EPA is addressing two issues related to landfill gas treatment. First, the EPA is proposing to clarify that the use of treated landfill gas is not limited to use as a fuel for a stationary combustion device but also allows other beneficial uses such as vehicle fuel, production of high-Btu gas for pipeline injection, and use as a raw material in a chemical manufacturing process. Second, the EPA is proposing to clarify what constitutes landfill gas treatment. For filtration and dewatering, the definition contains specific numerical values that would provide long-term protection of the combustion equipment, which would support good combustion. We are also proposing to clarify monitoring, recordkeeping, and reporting requirements for treatment systems.

Startup, shutdown and malfunction. In today's action, the EPA is proposing that the standards in proposed subpart XXX apply at all times, including periods of startup or shutdown, and periods of malfunction. In addition, to enable the EPA to determine the severity of an emissions exceedance for periods when the gas collection system or a control device is not operating, the EPA is proposing to add a recordkeeping and reporting requirement for landfill owners or operators to estimate emissions during such periods.

Other clarifications. The EPA is proposing other clarifications to address issues that have been raised by landfill owners or operators during implementation of the current NSPS. These other clarifications include improvements to criteria for exempting areas from collection and control, adding criteria for when an affected source must update its design plan, and clarifying when landfill owners or operators must submit corrective action timeline requests. We intend to address

[1] The EPA believes that it has the legal authority in updating an NSPS to either propose and make changes to the existing subpart or to promulgate a new subpart and has previously done both. In either case, any substantive changes to the NSPS will apply only to sources for which construction, reconstruction, or modification commenced on or after the date on which the proposed changes were published in the **Federal Register**.

clarifications and other implementation issues for existing landfills in a separate rulemaking.

C. Costs and Benefits

An MSW landfill owner or operator is expected to install the least-cost control for collecting and combusting landfill gas. The control costs include the costs to install and operate a GCCS. For certain landfills that were expected to generate revenue by using the landfill gas for energy, revenue from electricity sales was incorporated into the net control costs. The annualized costs also include testing and monitoring costs.

Proposed subpart XXX, which tightens the NMOC emissions threshold from 50 to 40 Mg/yr NMOC, would achieve reductions of 79 Mg NMOC/yr and 12,300 Mg methane/yr (about 307,600 Mg CO_2e/yr) beyond the baseline in year 2023. The associated annualized net cost for proposed subpart XXX is estimated to be an additional $471,000 (2012$) in 2023. The EPA expects that the avoided emissions will result in improvements in air quality and reduce health effects associated with exposure to air pollution related emissions, and result in climate co-benefits due to reductions of the methane component of landfill gas. However, because this rulemaking is not an ''economically significant regulatory action'' under Executive Order 12866 because it is not likely to have an annual effect on the economy of $100 million or more, we have not conducted a Regulatory Impact Analysis (RIA) or a benefits analysis. The baseline NSPS in effect today is estimated to achieve a reduction of 610 Mg/yr NMOC and 94,800 Mg/yr methane (about 2.4 million Mg/yr CO_2e) in 2023, compared to the absence of control (see section VI.A. of this preamble and the Economic Impact Analysis for more detail). The associated annualized net cost of the baseline is estimated to be $2.7 million ($2012) in 2023.

II. General Information

A. Does this action apply to me?

This proposal affects municipal solid waste (MSW) landfills and associated solid waste management programs. Affected categories and entities include those listed in Table 1 of this preamble.

TABLE 1—REGULATED ENTITIES

Category	NAICS [a]	Examples of affected facilities
Industry: Air and water resource and solid waste management	924110	Solid waste landfills.
Industry: Refuse systems—solid waste landfills	562212	Solid waste landfills.
State, local, and tribal government agencies	924110	Administration of air and water resource and solid waste management programs.

[a] North American Industry Classification System.

This table is not intended to be exhaustive but rather provides a guide for readers regarding entities likely to be regulated by the new subpart. To determine whether your facility would be regulated by this action, you should carefully examine the applicability criteria in proposed 40 CFR 60.760 of subpart XXX. If you have any questions regarding the applicability of the proposed subpart to a particular entity, contact the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. What should I consider as I prepare my comments?

1. Submitting CBI

Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that you mail to the EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or email. Send or deliver information identified as CBI to only the following address: Mr. Roberto Morales, OAQPS Document Control Officer (Room C404–02), U.S. EPA, Research Triangle Park, NC 27711, Attention Docket ID No. EPA–HQ–OAR–2003–0215.

If you have any questions about CBI or the procedures for claiming CBI, please consult the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

2. Docket

The docket number for the municipal solid waste landfills new source performance standards (40 CFR part 60, subpart XXX) is Docket ID No. EPA–HQ–OAR–2003–0215. Docket ID No. A–88–09 contains supporting information for related 40 CFR part 60, subparts WWW and Cc.

III. Background

In June 2013, President Obama issued a Climate Action Plan which, among other matters, directed the EPA and five other federal agencies to develop a comprehensive interagency strategy to reduce methane emissions. The plan recognized that methane emissions constitute a significant percentage of domestic greenhouse gas (GHG) emissions, highlighted reductions in methane emissions since 1990, and outlined specific actions that could be taken to achieve additional progress. Specifically, the federal agencies were instructed to focus on ''assessing current emissions data, addressing data gaps, identifying technologies and best practices for reducing emissions and identifying existing authorities and incentive-based opportunities to reduce methane emissions.''

As a follow up to the 2013 Climate Action Plan, the Climate Action Plan: Strategy to Reduce Methane Emissions (the Methane Strategy) was released in March 2014. The focus on reducing methane emissions is due to the fact that methane is a potent GHG with a global warming potential that is 25 times greater than carbon dioxide.[2] Methane has an atmospheric life of 12 years, and because of its potency as a GHG and its atmospheric life, reducing methane emissions achieves a near-term beneficial impact in mitigating global climate change.

The targeted strategy noted that the landfill standards at issue here and voluntary programs already in place

[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.

have considerably reduced methane emissions.[3] With respect to landfills, the Methane Strategy directs the agency to build upon progress to date through updates to the EPA's rules for reducing emissions from new, modified, and reconstructed landfills, issuance of an Advance Notice of Proposed Rulemaking (ANPRM) to explore options to address emissions from existing landfills, and encouragement of beneficial use through voluntary programs.

The EPA has long recognized the climate benefits associated with reducing methane emissions from landfills. In the 1991 Landfill NSPS Background Information Document[4] the EPA noted that reduction of methane emissions from MSW landfills is one of the many options available to reduce possible global warming. When the EPA promulgated the NSPS for MSW landfills, which regulates MSW landfill emissions (commonly referred to as landfill gas), in 1996, the EPA noted the co-benefits of controlling methane, but recognized the then relatively limited understanding of GHG and their effect on global climate change (61 FR 9917, March 12, 1996). In 1996, we stated:

> An ancillary benefit from regulating air emissions from MSW landfills is a reduction in the contribution of MSW landfill emissions to global emissions of methane. Methane is a major greenhouse gas, and is 20 to 30 times more potent than CO_2 on a molecule-per-molecule basis. There is a general concern within the scientific community that the increasing emissions of greenhouse gases could lead to climate change, although the rate and magnitude of these changes are uncertain.

Since 1996, the EPA and the scientific community have gained a better understanding of GHGs, such as methane, and their effects on climate change and human health and welfare. In 2009, the EPA Administrator issued the document known as the Endangerment Finding under CAA section 202(a)(1).[5] In the Endangerment Finding, which focused on public health and public welfare impacts within the United States, the Administrator found that elevated concentrations of GHGs in the atmosphere may reasonably be anticipated to endanger the public health and welfare of current and future generations.

There is now scientific consensus that GHGs affect climate change and, as recognized by the President in the Methane Strategy, this scientific consensus increases the need for the EPA to examine regulatory options for reducing methane emissions. The EPA is currently reviewing the MSW Landfills NSPS in light of the President's Climate Action Plan, the Methane Strategy, and improvements in the science related to GHG emissions, and is exploring opportunities to achieve additional reductions in emissions, including methane emissions.

A. Legal Authority

Section 111 of the Clean Air Act (CAA) requires the EPA Administrator to list categories of stationary sources that in the Administrator's judgment cause or contribute significantly to air pollution that may reasonably be anticipated to endanger public health or welfare. 42 U.S.C. § 7411(b)(1)(A). The EPA must then issue performance standards for new (and modified or reconstructed) sources in each source category. 42 U.S.C. § 7411(b)(1)(B). These standards are referred to as new source performance standards or NSPS. The EPA has the authority to define the scope of the source categories, determine the pollutants for which standards should be developed, set the emission level of the standards, and distinguish among classes, type and sizes within categories in establishing the standards. 42 U.S.C. § 7411(b).

On March 12, 1996 (61 FR 9905), under the authority of CAA section 111(b)(1)(A), the EPA added the MSW landfills source category to the priority list in 40 CFR 60.16 because, in the judgment of the Administrator, the source category contributes significantly to air pollution that may reasonably be anticipated to endanger public health and welfare. In that same notice, the EPA promulgated new source performance standards, which apply to new (and modified or reconstructed) landfills under the authority of CAA section 111(b)(1)(B), and emission guidelines, which apply to existing landfills, under the authority of CAA section 111(d). In the March 12, 1996 notice, the EPA defined the MSW landfills source category, identified municipal solid waste landfill emissions (commonly referred to as landfill gas) as the pollutant for which standards should be developed, identified which landfills would be covered, and determined the applicability thresholds and emission level of the standards.

CAA section 111(a)(1) (42 U.S.C. § 7411(a)(1)) provides that standards of performance are to ''reflect the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.'' We refer to this level of control as the best system of emission reduction or BSER. When promulgated in 1996, BSER for MSW landfills was determined to be a well designed and well operated LFG collection and control system with a control device capable of reducing NMOC by 98 percent by weight. NMOC was established as a surrogate for LFG in the final rule.

The CAA also requires the EPA to review the NSPS at least every 8 years to determine if the level of control that was previously established remains appropriate. Specifically, CAA section 111(b)(1)(B) (42 U.S.C. § 7411(b)(1)(B)) requires the EPA to ''at least every 8 years review and, if appropriate, revise'' standards of performance. The Administrator need not review a standard, however, if the ''Administrator determines that such review is not appropriate in light of readily available information on the efficacy'' of the standard. While not required to do so, the EPA has authority to revise an NSPS to add emission limits for pollutants or emission sources not currently regulated for that source category concurrent with its review of the NSPS (77 FR 49494, August 16, 2012).

In determining BSER, we typically conduct a review that identifies what emission reduction systems exist and how much they reduce air pollution in practice. Next, for each control system identified, we evaluate its costs, energy requirements, and any nonair quality health and environmental impacts. Based on our evaluation, we determine BSER for each pollutant to be regulated and establish an appropriate standard of performance based on the identified BSER. The resultant standard is usually expressed either as a numerical emissions limit, e.g., parts per million (ppm) or pounds per million British thermal unit (lb/MMBtu), or a percent reduction requirement. Although the standards are based on the identified BSER, the EPA may not require the use of a particular technology to comply with a performance standard unless the Administrator determines that it is not

[3] Climate Action Plan: Strategy to Reduce Methane Emissions. March 2014. p.5. *http://www.whitehouse.gov/sites/default/files/strategy_to_reduce_methane_emissions_2014-03-28_final.pdf.*

[4] Air Emissions from Municipal Solid Waste Landfills—Background Information for Proposed Standards and Guidelines, U.S. EPA (EPA–450/3–90–011a) (NTIS PB 91–197061) page 2–15.

[5] ''Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act,'' 74 FR 66496 (December 15, 2009) (''Endangerment Finding'').

feasible to prescribe or enforce a standard of performance. (CAA 111(b)(5), 42 U.S.C. 7411(b)(5).) Thus, except in rare circumstances, sources remain free to select any control measures that will meet the requirements of the standard(s). Upon promulgation, an NSPS becomes a national standard with which all new, reconstructed, and modified sources must comply. (CAA 111(e), 42 U.S.C. 7411(e).)

B. What is the purpose and scope of this action?

The purpose of this action is (1) to review the MSW landfills NSPS, (2) to propose a resolution or to provide clarification regarding implementation issues that were addressed in prior proposed rules published on May 23, 2002 (67 FR 36475) and September 8, 2006 (71 FR 53271), as they apply to new sources, and (3) to take comment on specific aspects of EPA's review that will be considered in promulgating the final NSPS standard. These proposed revisions appear in the proposed 40 CFR part 60 subpart XXX.

Many changes have occurred in the landfill industry since the landfills NSPS was originally promulgated in 1996 that have necessitated this review. Among the factors contributing to the need for review are the following: Changes in landfill characteristics (i.e., size, ownership, age) and population; proliferation of landfill gas energy projects; the availability of more comprehensive data on landfills from mandatory (Greenhouse Gas Reporting Program (GHGRP)) and voluntary EPA programs; and the introduction of new techniques for monitoring landfill gas emissions. The number and size distribution of MSW landfills in the United States has also evolved since 1996. Public opposition to local MSW disposal facilities and the increasing cost of disposal at locations near where the waste is generated have resulted in consolidation and led to an increase in long-distance hauls to large regional landfills. As a result, the corresponding emission profiles and per landfill compliance costs have also changed.

The number of landfill gas to energy projects has also increased substantially. In 1996, there were approximately 160 operational landfill gas energy projects and approximately 700 candidate landfills according to data obtained by the EPA Landfill Methane Outreach Program (LMOP). According to LMOP, as of March 2014, there were 636 operational projects using landfill gas to produce energy and 450 landfills that remain candidates for energy recovery. LMOP is a voluntary assistance program that encourages recovery and beneficial use of landfill gas, and in turn, helps to reduce methane emissions from landfills. During our review, the EPA has also become aware of techniques and procedures for monitoring landfill gas emissions that were not available at the time of the original rule.

The EPA is required to review the MSW Landfills NSPS and sections IV, V, and VI of this preamble present our initial determinations. In addition, the EPA has determined that it is appropriate to propose a revised NSPS based on these initial determinations.

This action also provides clarification regarding issues that arose during the implementation of the current landfills regulations and proposes regulatory text addressing some of those issues. We addressed these issues in previous notices as published on May 23, 2002 (67 FR 36475) and September 8, 2006 (71 FR 53271). These issues include the definition of landfill gas treatment and other topics such as surface monitoring, how to address closed areas of landfills and when to allow removal of controls. Although the cited notices addressed these issues in the context of subparts Cc and WWW, the clarifications and resolutions discussed in sections VII and VIII of this preamble would affect only landfills that commence construction, reconstruction, or modification on or after July 17, 2014.

The EPA plans to address amendments and clarifications resulting from implementation activities for landfills subject to 40 CFR part 60, subpart WWW and state or federal plans implementing subpart Cc in a separate action.

This action also requests comment on specific aspects of the EPA's review, the consideration of which will be integral to the EPA in taking final action to promulgate a new NSPS. These provisions include landfill gas treatment, wellhead monitoring, and surface monitoring. See section IX of this preamble for a discussion of those provisions.

C. Where in the Code of Federal Regulations will these changes appear?

The EPA is proposing to add new subpart XXX to 40 CFR part 60. Subpart XXX would apply to landfills that commence construction, reconstruction, or modification on or after July 17, 2014. Proposed subpart XXX in 40 CFR part 60 contains a revision to the NMOC emission rate threshold, as well as provisions that provide clarification and proposed resolutions to technical and implementation issues.

IV. Summary of Proposed Changes Based on Periodic Review of the MSW Landfills NSPS Under the CAA

The EPA is proposing to reduce the NMOC emission rate threshold for installing and operating a gas collection and control system to 40 Mg/yr from the current NSPS level of 50 Mg/yr. The proposal retains the design capacity cutoff of 2.5 million Mg and 2.5 million cubic meters that appears in subpart WWW. See sections V and VI of this preamble for a discussion of the proposed rule changes. The new subpart also resolves or clarifies issues that the EPA and stakeholders identified during implementation of the current landfills NSPS.

The EPA is proposing this revised emission threshold that takes into account the total methane emission reductions that can be achieved in addition to the reductions of NMOC emissions that are realized when the GCCS is installed at an earlier point in time. While the proposal continues to require measurement of NMOC as a surrogate for landfill gas, the EPA asserts that the methane reductions achieved are consistent with the President's Methane Strategy as described in section III of this preamble.

V. What analyses did the EPA conduct to determine BSER?

The EPA first undertook a review to determine whether a well designed and well operated landfill GCCS, which EPA previously determined was BSER for controlling landfill gas, remains BSER for that purpose. The EPA considered GCCSs, as well as other emission control technologies that are either currently in place at landfills, or could be adopted, and considered the emission reductions achieved by those systems. Based on this analysis, the EPA determined that a well designed and operated landfill GCCS remains BSER. The EPA then undertook an analysis to determine whether applying the existing criteria for installing and operating a landfill GCCS to the expected population of new MSW landfills remains the preferred approach to implementing BSER. To do so, the EPA developed and applied a model program in Microsoft® Access to revisit the design capacity cutoff, the NMOC emission rate cutoff, and the time allowed for installing and expanding a gas collection system. In addition to reviewing the thresholds that determine the schedule for installing and expanding the GCCS system, the EPA also reviewed whether the schedule for removing the GCCS needed adjustment (see section V.A of this preamble). For

the above analyses, the EPA compared the environmental benefits and corresponding costs that are expected to be achieved under various control options to the environmental benefits and corresponding costs that are expected to be achieved under the baseline.

A. Review of Control Technology

Prior to promulgation of the MSW landfills NSPS (40 CFR part 60, subpart WWW) in 1996, we conducted a review that identified the existing types of emission control systems being used and the corresponding emission reductions that were being achieved in practice. Based on that evaluation, we determined BSER to be: (1) A well designed and well operated landfill GCCS and (2) a control device capable of reducing NMOC in the collected gas by 98 percent by weight (56 FR 24468, May 30, 1991 and 61 FR 9914, March 12, 1996). For BSER, we set design and operating standards for the gas collection system and set an emission limit for the control system. Then, we established a schedule for installing and then expanding the GCCS based on the landfill's design capacity (2.5 million megagrams and 2.5 million cubic meters) and the estimated NMOC emissions rate (50 Mg/yr).

The current technology review shows that the same types of collection and control systems reviewed in 1996 (see Docket ID No. A–88–09) continue to be prominently used to reduce landfill gas emissions and the design and operational standards promulgated in 1996 continue to be robust. Section VI of this preamble discusses our findings resulting from consideration of potential revisions affecting the criteria and schedule for installing and then expanding the GCCS. We undertook this evaluation to determine if the thresholds associated with BSER established in 1996 are still relevant today, ''taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements'' in accordance with CAA section 111(a)(1).

In 1996, the EPA set design and operational standards in subpart WWW for the GCCS and an emission limit for the control device (61 FR 9907; March 12, 1996).[6] Subpart WWW established design criteria for both horizontal and vertical collection systems because both types of systems are used. The criteria ensure that owners and operators design, construct, and operate gas collection systems to maximize collection and minimize emissions of landfill gas. Landfill GCCS designed according to these criteria are expected to, at a minimum: (1) Be capable of handling the maximum gas generation rate, (2) have a design that provides for monitoring and adjusting the operation of the system, (3) be able to collect gas effectively from all areas of the landfill that warrant control, and (4) be expandable through the addition of further collection system components to collect gas from new areas of the landfill as they require control. Within 1 year of reaching or exceeding an NMOC emission rate of 50 Mg/yr, landfill owners and operators must submit (or update in the case of modification or reconstruction) a collection and control system design plan prepared by a professional engineer to the EPA or delegated authority for approval.

Gas collection system technology review. Our review shows that a gas collection system comprising gas collection wells, horizontal or vertical piping, and blowers continues to be the most common technology used to collect landfill gas, regardless of whether a landfill is complying with subpart WWW, state or local regulations, or voluntarily controlling landfill gas for other reasons. Landfills continue to collect landfill gas using gas collection systems that are similar to the types of systems described in the background information of the 1996 landfill NSPS and emission guidelines proposal.[7] As of 2013, hundreds of landfills have installed collection systems to comply with subpart WWW. The EPA is also aware that many landfill owners and operators have installed collection systems on a voluntary basis. As of 2013, approximately 500 landfills voluntarily collect and control landfill gas using the same technologies required by subpart WWW. The EPA estimated this number by comparing the list of landfills that are modeled to have installed a GCCS in 2014 in the NSPS/EG dataset to the list of landfills that are reported to have a GCCS installed in the LMOP database. See section V.B of this preamble for a discussion of the dataset of landfills and corresponding model that the EPA used to examine the potential impact of changes to the landfills NSPS. The LMOP database is a voluntary national database of landfills and landfill gas energy projects, including information on which landfills have a GCCS in place.

Landfill owners and operators collect landfill gas for a variety of reasons: To control odor, to minimize fire and explosion hazards, to recover landfill gas to be used for energy recovery, to sell carbon credits, and to comply with local, state, or federal air quality standards. Landfill owners and operators are motivated to design and operate their landfill gas collection systems to efficiently collect and control landfill gas and they continue to install a gas collection system comprising gas collection wells, horizontal or vertical piping, and blowers to collect and control landfill gas.

Gas collection system as BSER. For this NSPS review, the EPA is proposing that the combination of design and operational criteria in subpart WWW continue to ensure that the collection system efficiently collects landfill gas and that a gas collection and control system meeting these criteria continues to represent BSER for MSW landfills that commence construction, reconstruction, or modification after July 17, 2014. The EPA is also proposing that a combined design and operation standard for the gas collection system remains the best format for the rule. In developing subpart WWW, the EPA determined that in order to set a performance standard such as a collection efficiency for the gas collection system it would be necessary to quantify the landfill gas available for collection in comparison to the amount collected and that it was not technically feasible to measure the amount of gas available for collection. On that basis, the EPA concluded that it was necessary to establish a design and operation standard for the gas collection system (56 FR 24484, May 30, 1991). The EPA has not determined that the circumstances have changed so as to require the establishment of a standard of performance for the gas collection system. (CAA section 111(h)(3), 42 U.S.C. 7411(h)(3).) Therefore, for the gas collection system, the EPA proposes to maintain the design and operational standards in subpart WWW in subpart XXX.

Gas control system technology review. As part of the BSER review prior to promulgation of subpart WWW in 1996, we conducted a technology review that identified the existing types of emission control systems, emerging technologies, and the emission reductions achieved in

[6] In developing the current NSPS, the EPA determined that in order to set a performance standard such as a collection efficiency for the gas collection system it would be necessary to quantify the landfill gas available for collection in comparison to the amount collected and that it was not technically feasible to measure the amount of gas available for collection. On that basis, the EPA concluded that it was necessary to establish a design and operation standard for the gas collection system (56 FR 24484, May 30, 1991).

[7] Air Emissions from Municipal Solid Waste Landfills-Background Information for Proposed Standards and Guidelines, U.S. EPA (EPA–450/3–90–011a) (NTIS PB 91–197061).

practice by those systems. Properly operated GCCS reducing NMOC by 98 percent by weight had been demonstrated on landfills of the size affected by subpart WWW. The EPA selected a reduction of 98 percent as the level representing BSER for control of landfill gas because this is the level achievable by demonstrated technologies. Based on this analysis, the EPA selected 98 percent reduction, expressed as a performance level (i.e., a rate-based standard or percent control), as the appropriate BSER-based standard. The EPA determined that this level was reasonable considering costs, nonair quality health and environmental impacts, and energy requirements.[8] Subpart XXX, therefore, requires all control devices to demonstrate 98 percent reduction by weight of NMOC or an outlet concentration of 20 ppmvd of NMOC, as hexane. Enclosed combustion devices have the option of reducing emissions to 20 parts per million, dry volume.

Each of the estimated 1,000 gas collection systems in place today, both required and voluntary, has an associated combustion device used to control emissions of landfill gas. At a minimum, landfills employ a flare to combust the gas. Both open and enclosed flares were determined to be among BSER combustion devices and these technologies continue to be used today. The following combustion controls can achieve at least 98 percent destruction of NMOCs and we propose that they continue to represent BSER: Enclosed flares and incinerators, and devices that burn landfill gas to recover energy, such as boilers, turbines, and internal combustion engines. The EPA continues to believe that 98 percent reduction is appropriate because this continues to be the level achievable by demonstrated technologies. Current data are consistent with 98 percent destruction. However, we request comment and additional data on the NMOC destruction efficiency of incinerators and devices that burn landfill gas to recover energy, such as boilers, turbines, and internal combustion engines.

Non-enclosed flares used at landfills meeting the criteria in 40 CFR 60.18(b) are thought to have destruction efficiencies similar to enclosed flares and incinerators, and devices that burn landfill gas to recover energy, such as boilers, turbines, and internal combustion engines. However, in April 2012 the EPA conducted an external peer review on flaring efficiency and made available to the public a draft technical report, ''Parameters for Properly Designed and Operated Flares.'' [9] In this report, the EPA evaluated test data and identified a variety of parameters that may affect flare performance and that could be monitored to help assure good combustion efficiency. Nevertheless, none of the flare performance data used in this report comes from flares used at MSW landfills, and it does not provide any new test data on non-assisted flare types, which, to our knowledge, are the only non-enclosed flare type found in this source category. Thus, while we have no new information to suggest that flares at MSW landfills complying with 40 CFR 60.18(b) will not achieve at least 98 percent destruction of NMOCs (and methane), we solicit comments and additional information on flare performance specifically for this source category in order to determine whether non-enclosed flares continue to represent BSER for new landfills. Examples of information requested for this source category include: Prevalence of flaring; number and types of flares used; waste gas characteristics such as flow rate, composition and heat content; use of flare gas recovery and other flare emission minimization practices; and existing flare monitoring systems.

Gas control system as BSER. Based on the above, for this stage of the NSPS review, the EPA has determined that a control system designed and operated within the parameters demonstrated in the performance test to reduce NMOC (and, in turn, methane) by 98 percent by weight or reduction to 20 parts per million by volume, continues to represent BSER for controlling landfill gas emissions. Therefore, the EPA proposes in subpart XXX to maintain the current performance standard from subpart WWW for the gas control system.

Other current technologies. The EPA is also considering emission control technologies or practices other than GCCS that are currently in place as part of its review. The EPA qualitatively evaluated the emission reductions achieved by those systems in practice and also considered whether such technologies or practices could be relied upon in establishing a standard of performance under CAA section 111.

The EPA reviewed several best management practices (BMPs) for GCCS that may achieve greater reductions in landfill gas emissions than a well designed and well operated system alone. The EPA reviewed these BMPs to determine if and how they could be incorporated into subpart XXX in conjunction with the current performance-based standard.

One BMP the EPA considered was collecting landfill gas from leachate removal systems in order to control landfill gas that exists below the waste mass along the bottom of the landfill. The EPA is aware of landfills with leachate recirculation systems that have connected the landfill gas collection system and leachate collection system; however, references suggest that connection of these systems is not common at landfills that do not employ leachate recirculation.[10] The efficiency of capturing LFG emissions through this BMP depends on the efficiency of both the gas collection system and the leachate recirculation system. Proposed 40 CFR 60.762(b)(2)(i)(D) recognizes that leachate collection components may be part of a site-specific collection and control system design plan. Because the design plan is not prescriptive and instead contains design and operational standards that are site-specific, the design plan has the flexibility to include collection of landfill gas from leachate collection systems. However, since we do not currently have sufficient information on the efficacy of collecting gas from leachate removal systems in circumstances that do not include leachate recirculation and since the use of leachate recirculation is not prevalent in the landfill industry, the EPA does not currently consider this BMP to be part of BSER for controlling landfill gas, including methane, emissions. The EPA does, however, request comments on the efficacy and costs of enhancing gas collection systems to collect LFG from leachate removal or storage systems. The EPA also requests comment on the types of landfills currently collecting gas from leachate removal systems and the specifics of the gas collection systems used in practice. The EPA will use this information to evaluate if and when the use of an enhanced gas collection system that collects landfill gas from the leachate removal system may be appropriate.

Another BMP the EPA considered is requiring a gas collection system to prevent waterlogged wells, perhaps

[8] Air Emissions from Municipal Solid Waste Landfills—Background Information for Final Standards and Guidelines, EPA–453/R–94–021. EPA Office of Air and Radiation/Office of Air Quality Planning and Standards, Emission Standards Division, December 1995, page 2–79.

[9] U.S. EPA, Parameters for Properly Designed and Operated Flares, Report for Flare Review Panel, April 2012. *http://www.epa.gov/ttn/atw/flare/2012flaretechreport.pdf.*

[10] SCS Engineers, Technology and Management Options for Reducing Greenhouse Gas Emissions. Prepared for California Integrated Waste Management Board. Prepared by SCS Engineers. April 2008.

through the use of leachate removal pumps. Leachate and condensate can accumulate in collection wells, blocking landfill gas capture. Because a flooded well cannot collect gas, fixing a flooded well would have a high emission reduction potential. Wellhead operating parameters in proposed subpart XXX require that each owner or operator of an MSW landfill either operate the collection system with a negative pressure at each wellhead or, in areas with a geomembrane or synthetic cover, establish acceptable pressure limits in the design plan. These performance standards would help identify any inoperable wells resulting from flooding. The proposed surface emissions monitoring would also identify any elevated methane levels resulting from an inoperable well. The EPA has determined that the operating requirements in proposed subpart XXX provide a sufficient system to detect and correct waterlogged wells and thus ensure that the gas collection system is well operated.

The EPA does not currently consider requiring that the gas collection system be operated in such a way as to prevent waterlogged wells, rather than requiring that the wells be monitored so as to identify any such wells, to be BSER. Nonetheless, the EPA requests comment on whether the current combination of wellhead monitoring and surface emission monitoring is sufficient for identifying inoperable wells, especially in cases where wells have been installed for a significant amount of time. If the proposed monitoring systems are believed to be deficient for identifying flooded wells, the EPA also asks for comment on whether any additional recordkeeping, such as periodic measurement of liquid levels in gas wells, might be useful in identifying flooded wells that are not collecting gas.

The EPA also considered a BMP of requiring redundant seals and enhanced sealing materials on wellheads. One study includes a forward-looking infrared (FLIR) survey suggesting that landfill gas wellheads and other surface penetrations present high potential for concentrated leaks of organic compounds.[11] The use of advanced seals at wellheads may help to ensure that the well can apply sufficient vacuum to the landfill to facilitate gas extraction while preventing leaks of landfill gas to the atmosphere.

Proposed subpart XXX requires the preparation of a site-specific design plan by a professional engineer, which must be approved by the EPA or a delegated authority. Because the design plan is not prescriptive and instead contains design and operational standards that are site-specific, the design plan has the flexibility to determine the appropriate number or type of seals in order to accommodate the conditions and climates at different landfills. The EPA believes that this site-specific approach is preferable to specifying the use of a particular number of seals. This site-specific approach also provides for continued flexibility for future design plans to incorporate new sealing materials that may be more efficient than those currently available today. The design plan, coupled with wellhead and surface monitoring requirements, ensures that leaks from wells are minimized.

With this proposal, the EPA is clarifying that all cover penetrations must be checked during quarterly surface monitoring and this clarification would apply to checking around each wellhead for any elevated emission levels. Proposed subpart XXX requires corrective action for any surface monitoring reading over 500 ppm. Finally, the EPA is taking comment on tighter traverse patterns for surface monitoring, coupled with more rigorous surface maintenance activity, as another level of protection against leaks from improperly sealed wells.

Further, one reference indicates that many engineers already require two and sometimes three seals in a well when preparing design plans for GCCS. For all of these reasons, the EPA believes that a site-specific approach is more effective than prescribing the use of a particular number of seals or the use of a particular type of sealing material. As a result, at this point in its review, the EPA has determined that the use of advanced seals is not a component of BSER. The EPA, nevertheless, requests comment on whether the use of advanced seals should be a component of BSER.

The EPA also reviewed several emerging technologies that may achieve additional landfill gas emission reductions. The EPA evaluated whether the technology is adequately demonstrated and the extent to which the technology could be applied to new landfills.

The EPA considered a number of technologies that increase the methane oxidation rate of the landfill, thereby reducing the amount of methane that could escape through the surface of the landfill. Co-oxidation of NMOC has been observed during use of these alternative landfill cover materials, which has the potential to reduce odors and toxic air pollutants.[12] Oxidative covers, including biocovers, use methanotrophic bacteria to oxidize methane into water, carbon dioxide, and biomass. A biocover is an additional layer of final cover that is typically made of two layers, a permeable layer to evenly distribute the landfill gas to the oxidation media, and a layer of oxidation media typically made of soil, compost, or other porous media. While these innovative final cover practices at MSW landfills have the potential for achieving a moderate amount of methane emission reductions, final cover practices are currently addressed under Subtitle D of the Resource Conservation and Recovery Act (RCRA) and not under the CAA. As a result, the EPA does not currently consider them to be BSER; however, research indicates that biocovers may help to reduce emissions of methane, a primary constituent of landfill gas.

Another method for increasing the oxidation rate is to route passively vented landfill gas through a vessel containing methane-oxidizing media, commonly referred to as a biofiltration cell. Biofilters have been tested for use at landfills over only the past 10 to 15 years, and, although they may achieve moderate to high reductions in uncontrolled methane emissions, we cannot conclude at this time that these systems have been adequately demonstrated, as we explain below.[13] [14] Biofiltration cells are feasible for use only at small landfills or landfills with passive gas collection systems due to the size of the biofiltration bed required to treat the mixture of air and landfill gas. New landfills are expected to be large and have active gas collection systems to comply with the requirements in the proposed subpart XXX. In addition, due to the nature of passive gas collection systems, this technology lacks the ability to control and monitor the oxidation of methane in the landfill gas.[15]

No data exist on the long-term performance, effectiveness, or maintenance requirements of these

[11] ARCADIS. Quantifying Methane Abatement Efficiency at Three Municipal Solid Waste Landfills. Prepared for USEPA/ORD. January 2012.

[12] U.S. EPA. Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Municipal Solid Waste Landfills. June 2011.

[13] Buske, D. and M. Lannan. The Biofilter Effect on Landfill Gas Capture. 2009 SWANA Landfill Gas Symposium Proceedings.

[14] Gebert, J.; and Groengroeft, A., 2006, ''Performance of a passively vented field-scale biofilter for the microbial oxidation of landfill methane''. *Waste Management Research* 26: 399–407.

[15] USEPA. Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Municipal Solid Waste Landfills. June 2011. *http://www.epa.gov/nsr/ghgdocs/landfills.pdf.*

systems.[16] [17] [18] For these reasons, these methane oxidation technologies were not considered to be BSER. However, the EPA is requesting information about application of these technologies to better understand these characteristics for full-scale use of biocovers and biofilters. The EPA is seeking information and data about the long-term performance, effectiveness, and/or maintenance requirements of full-scale use of biocovers and biofilters, as well as comment on appropriate mechanisms to monitor the performance of these alternatives. Comment is also requested on biocover parameters and their effect on oxidation. Such parameters may include depth, soil characteristics, measurement, and their effect on percent oxidation.

B. What data and control criteria did the EPA consider in evaluating potential changes to the timing of installing, expanding, and removing the GCCS?

To examine the potential impact of changes to the timing of initiating landfill gas collection and control, the EPA developed a dataset of information for existing and new landfills, as described below, and applied a model to assess when controls were needed under the baseline control scenario as well as various regulatory options. Each regulatory option assessed variations in the design capacity and emission rate thresholds, as well as changes to the initial lag time and expansion lag time. The ''initial lag time'' is the time period between when the landfill exceeds the emission rate threshold and when controls are required to be installed and started up (30 months in subpart WWW). The ''expansion lag time'' is the amount of time allotted for the landfill to expand the GCCS into new areas of the landfill (5 years for active areas and 2 years for areas that are closed or at final grade in subpart WWW).

The EPA created a dataset of information for existing and new landfills, which included landfill-specific data such as landfill open and closure year, landfill design capacity, landfill design area, and landfill depth. The creation of the landfill dataset is detailed in the docketed memorandum, ''Summary of Landfill Dataset Used in the Cost and Emission Reduction Analysis of Landfills Regulations. 2014.''

The EPA used attributes of these existing landfills to develop model landfills to represent new landfills opening in the first 5 years after subpart XXX is proposed (2014–2018). The model future landfills were developed by evaluating the most recently opened existing landfills and assuming that the sizes and locations of landfills opening in the future would be similar to the sizes and locations of landfills that opened in the last 8 years with complete data (2003–2010).

The EPA then incorporated technical landfill parameters from this dataset, such as landfill size, annual waste acceptance rate, and open year, into a model in order to estimate when each landfill would install GCCS under various regulatory options. This model used a first-order decay equation to model the landfill gas emissions (i.e., NMOC and methane) from each landfill for 50 years following the effective date of subpart XXX.

The EPA programmed a Microsoft® Access database to calculate the cost and emission impacts associated with different regulatory options (hereinafter referred to as the ''model''). To determine when landfills exceeded regulatory emission thresholds, the model uses Tier 1 default values from subpart WWW for the methane generation potential (L_0) and the methane generation rate (k), but uses the NMOC concentration in ''Compilation of Air Pollutant Emission Factors (AP–42 [19])'' for determining when landfills would meet the regulatory NMOC emissions threshold. The Tier 1 default values in subpart WWW for L_0 and k are conservatively high for the purpose of estimating actual emissions; therefore, they are used only for estimating uncontrolled emissions to determine when landfills could exceed the threshold and be required to install controls. For the average NMOC concentration, the model uses the default value specified in AP–42. Subpart WWW allows the use of Tier 2 tests to determine NMOC concentration, and industry experience suggests the majority of landfills have conducted Tier 2 tests and obtained estimates that are consistent with the AP–42 NMOC value; thus, the AP–42 NMOC value was deemed to be more representative than Tier 1 NMOC values for determining when landfills would meet the regulatory NMOC emissions threshold for installing a landfill GCCS.

When modeled landfill gas emissions for a particular landfill exceeded the emission rate threshold, the EPA assumed that collection equipment was installed and started operating at the landfill after the initial lag time specified in each option. The EPA also assumed that as the landfill was filled over time, the landfill would expand the GCCS into new areas of waste placement in time intervals that coincide with the expansion lag time specified in each option.

To determine when controls may be capped or removed, and to calculate the amount of landfill gas, NMOC, and methane collected under each option, the model uses L_0, k, and NMOC values from AP–42 instead of the Tier 1 default values. To determine when control systems may be removed, subpart WWW requires landfills to conduct actual measurements of the collected gas flow rate and NMOC concentration. Because the AP–42 default values are more representative of actual emissions from landfills than Tier 1 values, they are more useful for predicting when a landfill would be able to remove its control system. For the same reason, AP–42 values were used to determine actual annual emissions reductions achieved by control systems.

To estimate the costs of each regulatory option, the EPA incorporated the estimated landfill gas recovery rates from the first-order decay equation and an estimated well field acreage into a set of cost equations based on EPA's Landfill Gas Energy Cost Model (LFGcost), version 2.3, which was developed by EPA's LMOP. (LFGcost estimates gas collection, flare and energy recovery system capital, operating, and maintenance costs.) The EPA also collected data on monitoring and testing costs such as initial performance tests, subpart WWW Tier 1 and Tier 2 calculations, and quarterly surface monitoring that were not provided in the LFGcost model.

The capital costs are all presented in year 2012 dollars and annualized using an interest rate of 7 percent over the lifetime of the equipment (typically 15 years), or in the case of drill mobilization costs, the length of time between each wellfield expansion. These annualized capital costs were added to the annual operating and maintenance costs estimated by LFGcost. The annualized cost includes capital requirements related to the purchase, installation, operation and maintenance of GCCS, and costs related to testing and monitoring requirements.

[16] Ibid.

[17] Abichou, T, J. Chanton, D. Powelson, ''Field Performance of Biocells, Biocovers, and Biofilters to Mitigate Greenhouse Gas Emissions from Landfills,'' State University Systems of Florida, Florida Center for Solid and Hazardous Waste Management March 2006.

[18] Yazdani, R, and Imhoff, P. Contractor's report to CalRecycle: Biocovers at Landfills for Methane Emissions Reduction Demonstration. October 2010.

[19] U.S. EPA, AP–42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources. 1995. *http://www.epa.gov/ttnchie1/ap42/.*

For certain landfills that were expected to generate revenue by using the LFG for energy, the EPA also estimated LFG energy recovery rates and associated costs to install and operate the energy recovery equipment as well as the revenue streams from the recovered energy. These revenues were subtracted from the annualized capital and operating and maintenance costs at each landfill in order to obtain a net cost estimate for each option in each year. The emission reduction and cost and revenue equations and assumptions are detailed in the docketed memorandum, ''Methodology for Estimating Cost and Emission Impacts of MSW Landfills Regulations. 2014.''

Often the EPA examines the impacts of NSPS at 5 years after rule implementation; however, the EPA selected 10 years for this landfills NSPS review, 2023. Due to the emission characteristics of new landfills that begin to accept waste in 2014 or after and the applicability provisions of the NSPS, 5 years would not provide a representative population of landfills for evaluating alternative standards, and in fact none of the modeled landfills would be expected to have installed controls by year five. Landfills do not become subject to the control requirements of the NSPS on the date that they begin operation. Instead, landfills exceeding the design capacity threshold become subject to control requirements 30 months after the emissions exceed the NMOC emission threshold. It may take well over 5 years for a newly constructed landfill to exceed the NMOC threshold, depending on the rate of waste acceptance and other site-specific factors. Therefore, evaluating the impacts of the rule at 5 years would significantly underestimate the impacts that subpart XXX may have on affected facilities.

The EPA recognizes that landfills have a unique emissions and emission control timeline over their lifetime, compared to other stationary sources of emissions. The quantity of emission reductions achieved and the costs to achieve those reductions will vary depending on where each landfill is in its lifecycle. By year 10 (year 2023), landfills in this analysis are further along in their lifecycle than they would be at year five and over half of the modeled landfills have installed controls, incurred costs, and achieved emission reductions under several options the EPA considered in its review of the NSPS.

C. What control options did the EPA consider?

When determining which control options would represent BSER, the EPA ran many permutations of various control options. Some options adjusted a single threshold in isolation; for example, reducing the NMOC emission threshold while keeping the design capacity threshold constant, or conversely, reducing the design capacity threshold while keeping the NMOC emission threshold constant. Other options adjusted multiple control parameters simultaneously, taking into account the relationship between the parameters. For example, recognizing that NMOC emissions are a function of waste-in-place, some options that significantly reduced the NMOC emission threshold also reduced the design capacity thresholds to avoid situations where the NMOC emission threshold would be exceeded long before the design capacity threshold. Other options increased the design capacity threshold while reducing the NMOC emission threshold by relatively small increments in order to minimize the reporting-only burden that would be imposed on landfills that had exceeded the design capacity threshold, but not the NMOC emission threshold, and would therefore be reporting, but not controlling.

In addition to adjusting applicability and emission control thresholds, other model runs varied the initial and/or expansion lag times. These variations estimated the impacts of requiring landfill owners or operators to install gas collection systems more quickly after crossing each applicable NMOC emission threshold. Specifically, some model runs assessed the impacts of reducing the initial lag time from 30 months (modeled as 3 years for the purpose of this analysis, as discussed in the docketed memorandum ''Methodology for Estimating Cost and Emission Impacts of MSW Landfills Regulations. 2014'') to 2 years. Model runs varying the expansion lag time were also run. For expansion lag times, subpart WWW allows 2 years after initial waste placement in closed areas and 5 years after initial waste placement in active areas of the landfill. As a result, the actual expansion lag time varies by landfill depending on how quickly expansion areas are filled and closed. Modern large landfill designs tend to expand the collection system 5 years after initial waste placement in active areas of the landfill. Based on input received during public outreach, most modern large landfills do not reach final grade within 2 years and a majority of landfills are complying with the 5 year provision. Therefore, a 4-year expansion lag time was assumed to represent the baseline, as discussed in more detail in the docketed memorandum ''Methodology for Estimating Cost and Emission Impacts of MSW Landfills Regulations. 2014.'' A shorter expansion lag time of 2 years after initial waste placement was examined as an alternative regulatory option. Some model runs evaluated the impacts of reducing both the initial and expansion lag times in parallel and other model runs evaluated the impacts of reduced emission and/or design capacity thresholds in conjunction with reduced initial and/or expansion lag times.

Preliminary results of the model runs showed that the current set of design capacity and NMOC emission threshold parameters in subpart WWW was the most cost effective option in year 2023. Options that reduced the NMOC emission threshold slightly, either in isolation or in conjunction with a reduction in the design capacity threshold had only a slightly higher cost effectiveness than the baseline. See the docketed memorandum ''Cost and Emissions Impacts Resulting from the Landfills NSPS Review. 2014'' and the docketed item ''Modeling Database Containing Inputs and Results of Proposed Revisions to MSW Landfill NSPS. 2014.'' Options that reduced the initial and/or expansion lag times to 2 years were typically less cost effective than the options that reduced the NMOC emission threshold.

Based on the results of the preliminary analysis, the EPA presented different model runs during Federalism consultations and small entity outreach that represented the range of variation in both the threshold and lag time parameters. For the options presented, Small entity representatives (SERs) and Federalism consultation participants provided feedback to the EPA, which included implementation concerns with varying certain parameters as part of this NSPS review, as discussed in the following section. The EPA took these concerns into consideration when developing the set of proposed options in this action.

D. What are the implementation concerns with changing the design capacity criteria?

Options that increase the design capacity threshold provide some opportunities for reduced reporting burden; however, these options also introduce the potential to miss emission reduction opportunities at certain landfills that exceed the NMOC

emission thresholds but do not meet the design capacity thresholds. Further, installation of GCCS at landfills with design capacities between 2.5 and 3.0 million Mg are well demonstrated. According to the LMOP database, there are more than 50 landfills out of 70 in this size range that have installed GCCS.

Options that reduce the design capacity threshold without also lowering the NMOC emission threshold would create additional reporting and permitting burden without any additional environmental benefit. These types of options would not change the number of landfills required to control emissions, but they would increase the number of landfills required to obtain an operating permit and also increase the number of landfills required to complete Tier 1 or Tier 2 emission calculations and reports.

When the EPA promulgated the 2.5 million Mg design capacity threshold in 1996, we considered the impact on small entities based on public comment (61 FR 9910). Today, small entities still tend to own smaller sized landfills, whereas larger entities tend to own larger regional landfills. Approximately 10 percent of the landfills subject to subpart WWW or the MSW landfills state or federal plan implementing subpart Cc are owned by small entities. Further, the cost burden for installing a collection and control system is more significant for small landfills, which are more often owned by small entities, than larger landfills. Certain costs to construct the gas collection system (e.g., flat fees for drill rig mobilization, and monitoring and construction costs) remain relatively constant regardless of the size of the landfill.

For these reasons, the EPA is not proposing any changes to the current design capacity threshold of 2.5 million Mg and 2.5 million m^3.

E. What are the implementation concerns with reducing the NMOC threshold?

The EPA recognizes that NMOC emissions are site specific, varying widely from landfill to landfill and understands that a majority of landfills currently affected by subpart WWW conduct Tier 2 testing in order to refine their NMOC emission estimates before installing a GCCS.

Lowering the NMOC emission threshold would result in earlier GCCS installations, 13 percent more emission reductions, and a dollar-per-Mg cost to control NMOC that is higher than the baseline ($6,000/Mg NMOC vs. $4,400/Mg NMOC). Despite these higher costs, the EPA also recognizes the value of reducing methane emissions ($1.50/Mg CO_2e vs. $1.10/Mg CO_2e at baseline) that are associated with a lower NMOC emission threshold, as discussed in sections III and VI.B of this preamble. Based on these considerations, among others, the EPA is proposing to reduce the NMOC emission threshold from 50 Mg/yr to 40 Mg/yr. See section VI.B of this preamble for more details.

F. What are the implementation concerns with shortening the initial or expansion lag times?

The emission reductions achieved by reducing the initial or expansion lag time are affected by the size of the landfill, waste placement patterns, and annual acceptance rates. For example, the size of the landfill and the filling cycle affects how much and when emission reductions would be achieved. Based on comments received from SERs and Federalism consultation participants, modern landfill designs typically do not reach final grade before 7 years. Because the landfills NSPS allows two options for expanding the GCCS (2 years after initial waste placement in closed areas and 5 years after initial waste placement in active areas), any reduction to the 2 year lag time for closed areas would not likely achieve any actual additional reductions from these larger landfills because the majority of landfills are complying with the 5-year allowance period instead of the 2-year allowance period. Modifying the 5-year provision may also have a limited actual impact on emission reductions. Many landfills in wet climates install wells ahead of the 5-year schedule for odor or energy recovery purposes. When examining the effects of shortening the lag times, the emission reductions vary over the time period considered. To visually observe how reducing the lag times affects emissions and reductions over the 10-year period following proposal, see the charts comparing emissions from reduced lag times in the docketed memorandum, ''Cost and Emissions Impacts Resulting from the Landfills NSPS Review. 2014.''

When isolating the timeframe for initial GCCS installation from the other control criteria, modeling showed that the reductions in year 2023 are lower than those estimated to be achieved under the current baseline. Although the initial GCCS would be installed earlier, for example in year 2020, it would also be designed slightly smaller (i.e., a smaller number of wells) than a GCCS installed in a later year. By 2023, the system would not have been expanded yet, thus, the total amount of emission reductions achieved in 2023 will be less than the baseline until the system is expanded in 2024.

Reducing the expansion lag time would achieve a short period of modeled reductions during every expansion cycle because the GCCS would be expanded one year earlier. Emission reductions in year 2023 would be approximately 27 percent higher than an option that did not shorten the expansion lag time. However, when considered over a 10-year period, the additional emission reduction would be approximately 8 percent.

Small entity representatives and Federalism consultation participants expressed concern about the potential shortening of lag times. For details, refer to the docketed report ''Summary of Small Entity Outreach. 2014.''

According to the commenters, reduced lag times would result in the installation of more GCCS equipment in active fill areas. Wells located in these areas are more frequently damaged as a result of daily filling operations and the movement of equipment. Damaged wells must be repaired with well extensions and/or redrilling of wells. In addition, waste in active fill areas undergoes significant settlement. This settlement affects the alignment of gas header equipment, requiring more frequent repairs, troubleshooting, and replacement of equipment. These repairs can add a significant cost to the construction and operation of a GCCS that is not currently accounted for in the LFGcost estimates and also increase the amount of system downtime.

In addition to the implementation concerns, reducing the lag times would require more frequent mobilization of drill rig equipment, purchase of GCCS infrastructure, and system repairs, which could lead to higher costs. In year 2023, the dollar-per-Mg cost to reduce the initial and/or expansion lag times in conjunction with reducing the NMOC threshold are higher than the options that do not adjust the lag times ($6,900 to $11,300/Mg NMOC vs. $6,000/Mg NMOC). This higher cost is due in part to the timing of the first round of wellfield expansions at these new landfills, many of which were modeled to expand their systems in 2023, and thus incurring additional costs in that year to operate both the initial GCCS and the first set of expansion wells.

Small entity representatives and Federalism consultation participants raised several practical concerns with reducing the expansion lag time. Reducing the expansion lag time would result in more wells located in active fill areas because more of the face of the landfill is active after only 2 years of waste acceptance and the landfill owner

or operator must add wells into these active areas sooner.

In addition, active fill areas are still in the aerobic phase of waste decomposition. Installing wells in areas with high oxygen levels increases the chance of subsurface fires. It also leads to more frequent exceedances of the current wellhead monitoring standards for oxygen. In these cases the landfill owner or operator would also be unlikely to request a higher operating value for oxygen because they would have difficulty meeting the two criteria in proposed 40 CFR 60.763(c) for a higher operating value demonstration: A higher operating value must not cause fires and must not significantly inhibit anaerobic decomposition by killing methanogens. Neither of these criteria would apply to wells located in active fill areas.

Horizontal LFG collection wells may provide some relief to these implementation concerns that were raised by the SERs, while also allowing for the wells to be installed more quickly after the waste is placed in the landfill. These types of wells consist of perforated pipe in gravel-filled trenches constructed within the waste mass as an active area is filled. The wellheads are installed remotely outside of the active fill area to allow landfill owners/operators to monitor the wells. Although the horizontal collection infrastructure is installed as the waste is placed in the fill area, the collectors are not brought online under an active vacuum until a sufficient refuse layer has been placed on top of the collectors. This time period is necessary in order to prevent air infiltration in the landfill. However, this time period is often shorter than the timeframe needed to install vertical wells, and can be as short as a few months after refuse is buried.[20]

The EPA is aware of several horizontal collector installations, including several landfills in California [21] and 18 different landfills that reported using horizontal collectors in the voluntary data collection effort for this rulemaking (see ''Summary of Landfill Dataset Used in the Cost and Emission Reduction Analysis of Landfills Regulations. 2014'').

The shorter length of time associated with bringing horizontal collectors online can be especially important at landfills employing liquids recirculation techniques or located in wetter climates, given the higher LFG generation rates at those sites (see section V.G of this preamble). Bringing these collectors online more quickly and more proactively addresses odor concerns at landfills. These systems are also useful in landfills that practice ''over-filling,'' where new waste is placed on top of a section of the landfill that was capped temporarily. SERs did express some implementation concerns with horizontal collectors, indicating that these systems have a shorter lifetime than vertical wells and require more frequent replacement.

For the reasons presented in this section, the EPA is not proposing to shorten the initial or expansion lag times from the lag times codified in subpart WWW. However, the EPA requests comment on the feasibility and potential benefits of reducing either or both of the lag times. Specifically, the EPA requests comment on the practicality, cost, and emission reduction implications of installing or expanding the wellfield on active areas in a shorter timeframe. The EPA believes that this may be appropriate since horizontal collector systems have been installed at several landfills that were not in operation when the NSPS was originally promulgated in 1996. The EPA also requests data and/or comment on the potential emission reductions and corresponding costs that could result from reduced lag times. The EPA also notes that the cost analysis presented in section X of this preamble is based on vertical wells and the EPA is interested in any comments and data that address any differential in costs between these two types of systems.

G. Request for Comment on BSER

The EPA is requesting comment on several items regarding BSER. EPA is requesting comment on the proposed design and operational standards for new sources that EPA believes are necessary to ensure a GCCS is well designed and well operated. The EPA is requesting comment on additional emission control technologies that are in place at landfills—other than a GCCS as described here—that could be considered BSER. We request descriptions of such systems, an indication of their current use, data demonstrating emission reductions, and corresponding costs of such systems. The EPA is also requesting comment on whether a well designed and well operated GCCS in conjunction with any of the technologies or practices discussed in section V.A of this preamble should be considered to be BSER.

The EPA is also taking comment on whether it should consider reducing the design capacity threshold or initial lag times for landfills that are located in a wet climate or that recirculate leachate or add other liquids to the landfills to accelerate waste decomposition. Wetter wastes decompose more quickly than drier wastes and as a result generate more landfill gas in the short term. Therefore, it may be appropriate to require these landfills to install the gas collection system sooner, which SERs indicated is already occurring in practice for landfills in wetter climates. Similarly, smaller landfills in wetter climates, or those employing leachate recirculation, may also generate earlier spikes in landfill gas emissions that could exceed the NMOC threshold. Although these landfills are exempt from proposed subpart XXX under the design capacity threshold of 2.5 million Mg and 2.5 million cubic meters, if a smaller design capacity threshold were adopted for these wet landfills, more emission reductions may be achieved.

If a separate set of thresholds and/or lag times were to apply to these wet landfills, the EPA requests comment on how a wet landfill might be defined. For example, a wet landfill could be defined as a landfill that has precipitation of greater than 25 inches per year and/or recirculates leachate (or other liquids).

VI. Rationale for the Proposed Changes Based on Review of the NSPS

To determine which option to propose, the EPA considered the emission reductions that are expected to be achieved under the criteria in the baseline (subpart WWW), as well as emission reductions that would be achieved under several control options more stringent than the baseline.

A. What are the environmental impacts and costs associated with the baseline?

In this analysis, the baseline contains the same gas collection and control requirements and thresholds (2.5 million Mg or 2.5 million cubic meters and 50 Mg NMOC per year) that are in subpart WWW. For the baseline, the initial lag time is 30 months; and the expansion lag time is 2 years after initial waste placement in cells that are closed or at final grade or 5 years after initial waste placement in active areas of the landfill. These parameters are described in detail in section V of this preamble.

Table 2 of this preamble summarizes the impacts of the baseline for year 2023. The table includes emission reductions for NMOC, methane, and carbon dioxide equivalent (CO_2e) and corresponding annualized net costs based on the annualized control, testing,

[20] Barlaz et al., Controls on Landfill Gas Collection Efficiency: Instantaneous and Lifetime Performance 59 J. Air & Waste Mgmt. Ass'n 1399, 1402–03 (Dec. 2009).

[21] SCS Engineers, Technology and Management Options for Reducing Greenhouse Gas Emissions. Prepared for California Integrated Waste Management Board.

and monitoring costs, and annual revenues from energy recovery (when applicable), as discussed in section V.B of this preamble.

TABLE 2—BASELINE EMISSION REDUCTIONS AND COSTS IN 2023

Number of landfills affected	Number of landfills controlling	Number of landfills reporting but not controlling	Annual net cost ($2012) [a]	Annual NMOC reductions (Mg/yr)	Annual methane reductions (Mg/yr)	Annual CO_2e reductions (Mg/yr)	NMOC cost effectiveness ($/Mg)	Methane cost effectiveness ($/Mg)	CO_2e cost effectiveness ($/Mg)
17	8	9	2,708,000	610	94,800	2,371,000	4,400	29	1.1

[a] The annualized net cost ($2,708,000) is the difference between the average annualized revenue ($21,315,300) and the sum of annualized control cost ($23,956,900) and the average annualized testing and monitoring costs ($66,400).

The baseline is estimated to require control at eight landfills in 2023, and achieve reductions of 610 Mg/yr NMOC, 94,800 Mg/yr methane (2,371,000 Mg/yr CO_2e). The annualized net cost is $2.7 million. The cost effectiveness of the baseline is estimated to be $4,400 per Mg NMOC, and $29 per Mg methane ($1.10 per Mg CO_2e) if all of the control cost were attributed to each pollutant separately.

In this analysis, the EPA projects 21 new landfills would commence construction, reconstruction, or modification between 2014 and 2018. The basis of this projection is discussed in detail in the docketed memorandum ''Summary of Landfill Dataset Used in the Cost and Emission Reduction Analysis of Landfills Regulations. 2014.'' These 21 landfills are projected to emit, 1,040 Mg/yr of NMOC and 161,600 Mg/yr of methane in 2023 if the landfills had no emission controls in place. However, the baseline is modeled to require 38 percent (8/21) of these projected landfills to install emission controls by at least year 2023. In terms of emissions, the baseline is expected to achieve 59 percent reduction in estimated emissions from these landfills in 2023. Further, the eight landfills installing controls under the baseline represent 77 percent of the estimated total waste-in-place in 2023 from all 21 of the projected landfills.

The baseline allows landfills to remove the GCCS only after the following criteria are met (1) the landfill is closed, (2) the landfill has had the GCCS in operation for at least 15 years, and (3) three successive tests for NMOC emissions are below the NMOC emission threshold of 50 Mg/yr. Until the GCCS is removed, the landfill must continue to operate the system in accordance with 40 CFR 60.763, which includes wellhead monitoring and surface emissions monitoring to detect and correct for any emission exceedances.

B. How did the EPA determine which control option to propose?

When determining which control options would represent BSER, the EPA considered several factors: The implementation concerns identified in section V of this preamble; and the incremental emission reductions, cost, and co-benefits that would be achieved beyond the baseline.

The EPA compared the annualized net cost and emission impacts in 2023 of the various regulatory options to the annualized net costs and emission impacts in 2023 of the baseline. The EPA analyzed numerous iterations of alternate control and reporting thresholds and presented potential control options to SERs and Federalism consultation participants, as described in section V of this preamble. After considering feedback from the SERs and Federalism consultation participants, the EPA selected for consideration three regulatory alternatives as presented in Table 3 of this preamble. Table 3 of this preamble summarizes the incremental impacts of each control option, when compared to the baseline. The table shows the emission reductions and corresponding annualized net costs for NMOC and methane in 2023.

TABLE 3—EMISSION REDUCTIONS AND COSTS FOR CONTROL OPTIONS IN YEAR 2023

Control parameters	Number of landfills affected [a]	Number of landfills controlling [a]	Annual net cost (2012$)	Annual NMOC reductions (Mg/yr)	Annual methane reductions (Mg/yr)	Annual methane reductions (Mg CO_2e/yr)	NMOC cost effectiveness ($/Mg)	Methane cost effectiveness ($/Mg)	Methane cost effectiveness * ($/Mg CO_2e)
Baseline = 2.5 million Mg and m^3, design capacity and 50 Mg/yr NMOC									
Baseline (2.5 design capacity/50 Mg/yr NMOC)	17	8	2,708,000	610	94,800	2,371,000	4,400	29	1.1
Incremental values versus the Baseline									
Option (3.0 design capacity/40 Mg/yr NMOC	0	3	471,000	79	12,300	307,600	6,000	38	1.5
Option (2.5 design capacity/40 Mg/yr NMOC	0	3	471,000	79	12,300	307,600	6,000	38	1.5
Option (2.0 design capacity/40 Mg/yr NMOC	1	3	472,700	79	12,300	307,600	6,000	38	1.5

[a] Landfills are affected by the landfills NSPS based on design capacity. Once affected, they calculate and report emissions until they exceed the NMOC threshold, which triggers control requirements.

Baseline. The baseline affects 17 new landfills, meaning that 17 landfills meet the design capacity thresholds and would have to report their emissions during this period. Eight of these landfills would have controls in place in

year 2023. The baseline values are compared to landfills' emissions assuming that no GCCS are installed. This comparison to a no-control scenario may overestimate both the costs and emissions reduction resulting from implementation of subpart XXX due to other regulatory or voluntary reasons for installing GCCS, as discussed below.

The EPA is aware that some state or local ordinances require landfill gas combustion for odor, safety, or methane control reasons. For example, methane regulations in California [22] require GCCS to be installed at all landfills accepting waste after January 1, 1977, having at least 450,000 tons of waste-in-place, and having a gas heat input capacity threshold of 3.0 MMBtu/hr or greater to install GCCS. The emission reductions from these programs could not be quantified for the projected set of model landfills because the EPA cannot reliably estimate where these future landfills will be installed.

Finally, based on data from LMOP, the EPA is also aware of approximately 500 landfills that have voluntarily installed a gas collection system that would not otherwise be required under federal NSPS or emission guideline regulations (see section V.A of this preamble for details). These systems may have been installed to recover energy and generate revenue, including sale of electricity or landfill gas as well as to create carbon credits. However, because it is not known how many projected new landfills will voluntarily collect and combust their gas in the absence of NSPS regulation, the reductions associated with voluntary gas collection system installations were not considered when establishing the reductions associated with the baseline.

Regulatory options. The EPA considered three regulatory options more stringent than the baseline, as presented in Table 3 of this preamble. Based on the characteristics of the projected landfills, all three of the more stringent options would require a total of 11 landfills to install controls by 2023. Thus, 11 landfills would incur costs and achieve emission reductions in 2023 under all of the more stringent options, compared with eight landfills under the baseline.

Although the overall difference in the number of landfills requiring control in 2023 under the more stringent options is only three landfills, it is important to note that each of these options would require controls to be installed earlier than the baseline, because lower NMOC emission thresholds would subject landfills to the control requirements at an earlier date.

Table 4 presents the number of landfills with control systems installed, by year, for the baseline and options considered in this analysis. Due to the 30-month initial lag time period, no controls are anticipated to be installed prior to 2020 under any of the options under consideration.

TABLE 4—TOTAL NUMBER OF NEW LANDFILLS PROJECTED TO CONTROL LANDFILL GAS EMISSIONS IN EACH YEAR OF THE 10-YEAR PERIOD, BY OPTION

Control parameters	Number of landfills with control systems installed				
	2014–2019	2020	2021	2022	2023
Baseline 2.5/50	0	0	6	7	8
Option 3.0/40	0	3	6	7	11
Option 2.5/40	0	3	6	7	11
Option 2.0/40	0	3	6	7	11

Emission reductions. Under all three of the options considered, three additional landfills would be required to install controls in 2023 compared to the baseline. The reductions achieved under these three options are the same because each option has the same NMOC threshold trigger of 40 Mg/yr. The corresponding emission reductions in 2023 would be an additional 79 Mg/year NMOC, 12,300 Mg/year methane (307,600 Mg/year CO_2e) compared to the baseline. The wide range in magnitude of emission reductions among pollutants is due to the composition of landfill gas: NMOC represents less than 1 percent of landfill gas, while methane represents approximately 50 percent. CO_2e is an expression of methane in terms of the carbon dioxide equivalents, given the methane global warming potential (GWP) of 25.[23] Each of these options represents approximately a 13 percent reduction beyond the baseline.

Cost. Under both options 2.5/40 and 3.0/40, the incremental annual cost would be $471,000. The cost is identical for these two options because all of the projected new landfills that exceed the NMOC thresholds and install controls by 2023 have a design capacity greater than 3.0 million Mg. Based on the characteristics of recently constructed landfills, it is likely that most new landfills will be larger sites. The incremental annual cost of option 2.0/40 is $2,700 higher, at $472,700 due to additional reporting costs for one landfill that is projected to exceed the lowered design capacity threshold but not the NMOC threshold. All of these options represent approximately 17 percent in additional costs beyond the baseline.

In terms of cost effectiveness, the overall dollar-per-Mg cost for NMOC reductions is $4,400 per Mg NMOC under the baseline in Table 3 of this preamble. Note the cost of controlling methane is significantly lower than for NMOC because methane constitutes approximately 50 percent of landfill gas, while NMOC represents less than 1 percent of landfill gas. The incremental dollar-per-Mg cost for NMOC reductions is $6,000 per Mg NMOC under all of the other options. For option 2.0/40, however, there are additional reporting requirements for one landfill affected by this option that would result in a marginally higher actual cost compared with the option 2.5/40. Therefore, we are not proposing option 2.0/40. Other than the added reporting costs, the emission reductions and control costs are identical for options 2.5/40 and 3.0/40. For the reasons stated in section V.D of this preamble (potential to miss reductions at landfills that exceed the NMOC emission thresholds but do not

[22] California Code of Regulations, title 17, subchapter 10, article 4, subarticle 6, sections 95460 to 95476, Methane Emissions from Municipal Solid Waste Landfills.

[23] 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.

meet the design capacity thresholds and application of GCCS at landfills with design capacities between 2.5 and 3.0 million Mg is well demonstrated), alternative option 3.0/40 is also not being proposed.

Proposed option 2.5/40. Based on the emission reduction and cost discussions above and consistent with the President's Methane Strategy as discussed in section III of this preamble, the EPA is proposing to reduce the NMOC threshold to 40 Mg/yr. Lowering the NMOC threshold would result in earlier GCCS installations and additional NMOC and methane reductions compared to the baseline, as shown in Table 3 of this preamble. This lowered threshold achieves reductions without adjusting the initial and expansion lag times and incurring the associated costs and implementation concerns.

Reducing the NMOC threshold from the baseline-level of 50 Mg/yr to 40 Mg/yr would affect only three more landfills in 2023 but would achieve an estimated 13 percent additional reduction in emissions of NMOC and methane compared to the baseline. Further, this proposal would maintain the same control device removal criteria as the baseline except that the controls would have to stay on until three successive tests for NMOC emissions were below the NMOC emission threshold of 40 Mg/yr instead of 50 Mg/yr. Depending on the waste-in-place of the landfill at closure and other site-specific factors (e.g., waste composition, climate), it may take more than 30 years after closure for a large modern landfill to emit less than the NMOC emission threshold, and in turn qualify for capping or removing the GCCS. Although the emission reductions associated with these later years in the landfills' lifetimes are not incorporated in the environmental and economic impacts of the baseline and options under consideration, the lower threshold associated with this proposal would require controls to be installed for a slightly longer period than the baseline.

Although some commenters have expressed concerns about the quantity of emissions after landfills have closed and the GCCS has ceased to operate, the analysis the EPA conducted demonstrates that GCCS would be installed for a significant period after landfill closure that is commensurate with the size and corresponding emissions profile of each affected landfill. For these reasons, the EPA is proposing that emissions must be below an emissions threshold of 40 Mg/yr as one of the three criteria for determining when a GCCS may be capped or removed. The EPA is also requesting comment on whether these three criteria are appropriate, and if alternative criteria such as consecutive quarterly measurements below a surface emission threshold should also be considered. RCRA, specifically subpart F of Part 258, also requires supplemental basic post-closure care to maintain cover integrity.

Reducing the NMOC threshold also recognizes the opportunity to build upon progress to date and achieve even more reductions of landfill gas and its components, consistent with the President's Methane Strategy as discussed in section III of this preamble. Landfill gas generated from established waste (waste that has been in place for at least a year) is typically composed of roughly 50 percent methane and 50 percent carbon dioxide by volume, with less than 1 percent NMOC. Because the components of landfill gas are associated with substantial health, welfare, and climate effects, additional reductions of landfill gas would improve air quality and reduce health and welfare effects associated with exposure to landfill gas emissions. Note that in 2012, landfills continued to be the third largest source of human-related methane emissions in the United States, representing 18.1 percent of total methane emissions.[24] Methane emissions represent 8.7 percent of all GHG emissions (in CO_2e) in the United States.

Alternative option 2.0/34. Consistent with the President's Methane Strategy and the potential to achieve a near-term beneficial impact in mitigating global climate change (see section III of this preamble), the EPA considered even more stringent alternatives in its analysis of control options that may achieve additional reductions of methane and NMOC. For example, reducing the NMOC threshold below 40 Mg/yr in conjunction with reducing the design capacity to below 2.5 million Mg or 2.5 million cubic meters, an alternative option 2.0/34 would require controls at 11 landfills by 2023, which is the same number of landfills required to control under this proposal. However, under this more stringent option, four of the 11 landfills would install controls one year earlier. The extent of the emission reductions for this option depends on the time period considered. For example, in year 2023, emission reductions would not be any greater than the proposal. However, when averaged over the 10-year period (2014–2023), this more stringent option would achieve additional NMOC and methane reductions compared with the proposal. Refer to the Environmental Impacts Analysis,[25] and the docketed memoranda ''Cost and Emissions Impacts Resulting from the Landfills NSPS Review. 2014'' for details on the estimated reductions. Additional emission reductions would be expected to be achieved over the lifetime of the landfills subject to subpart XXX because the lower NMOC threshold would require earlier installation of controls and also require the controls to remain installed for a longer period. The annualized cost to implement alternative option 2.0/34 would be higher than the proposal. The EPA did not analyze an option that reduced the NMOC threshold below 40 Mg/year without also reducing the design capacity threshold. In light of these additional reductions, as well as the additional costs to affected entities, the EPA is soliciting comment on whether an NMOC threshold below 40 Mg/yr in conjunction with a reduced design capacity threshold should be considered for new landfills subject to subpart XXX.

VII. Summary of Clarifications and Resolutions That Are the Result of Implementation Activity

The EPA proposed amendments to the landfills NSPS (40 CFR part 60, subpart WWW) on May 23, 2002 (67 FR 36475) to address implementation issues. Consideration of public comments received and additional implementation activity led to the proposal of further clarifications on implementing the landfills regulations on September 8, 2006. After considering public comments received on the September 8, 2006 amendments and additional implementation activity, we are proposing resolutions and clarifications of the issues specifically identified below under new subpart XXX. The EPA plans to address amendments and clarifications resulting from implementation activities as they apply to subparts Cc and WWW in a separate document. The EPA will also address any potential changes to subparts Cc and WWW in a separate document. Thus EPA is not taking final action on either the May 23, 2002 or the September 8, 2006 proposed rules at this time. In addition to the specifically identified resolutions and clarifications associated with the May 23, 2002 and September 8, 2006 proposed rules, we are proposing a number of provisions in subpart XXX that are intended to address other implementation issues

[25] Municipal Solid Waste Landfills, Economic Impact Analysis for the Proposed New Subpart to the New Source Performance Standards.

that have arisen in the context of subpart WWW.

2002 Proposed amendments. On May 23, 2002 (67 FR 36475), the EPA proposed several amendments to subpart WWW, including clarifying what constitutes treated landfill gas by adding a definition of treatment system that specified that the system must filter, de-water, and compress landfill gas.

2006 Proposed amendments. Public comments on the May 23, 2002 amendments created new questions and caused the EPA to reconsider the approach we had taken on several proposed amendments, including our approach to clarifying what constitutes treated landfill gas. Specifically, we proposed refined definitions of ''treated landfill gas'' and ''treatment system'' by adding specific numerical values for filtration and de-watering to provide long-term protection of the combustion equipment, which would also support good combustion. The September 8, 2006 amendments also proposed to clarify the monitoring requirements for treatment systems.

The following resolutions and clarifications apply to proposed subpart XXX.

A. Definitions for Treated Landfill Gas and Treatment System and Treatment System Monitoring

Subpart XXX contains requirements for landfill gas treatment that are consistent with the September 8, 2006 proposed amendments, except that the treatment definition would require the water dew point of landfill gas to be reduced to at least 45 °F, rather than lowered by at least 20 °F. We also propose to specify a location for the temperature monitoring device that would demonstrate continuous compliance with the 45 °F requirement. The measurement device would be located at (or immediately after) the coalescing filter or other direct contact moisture removal device that follows the chiller and removes the condensed moisture. If a landfill owner/operator uses de-watering equipment that is not based on cooling the gas, such as a desiccant system, the landfill owner/operator would monitor dew point instead of temperature. For particulate matter filtration, we propose to retain the requirement for a filter system to have an absolute rating no greater than 10 microns.

We also propose to clarify monitoring, recordkeeping, and reporting requirements for treatment systems. To ensure that treatment systems are operating properly to achieve the filtration and de-watering levels specified in the revised proposed treatment system definition, owners/operators would install equipment to continuously monitor pressure drop across a filter, temperature for a chiller-based de-watering system, and dew point for a non-chiller-based de-watering system. Owners/operators would record 24-hour block averages. Owners/operators may use other site-specific monitoring parameters if they demonstrate that such parameters would effectively monitor filtration or de-watering system performance. For other site-specific monitoring parameters, owners/operators must develop operating ranges for each monitored operating parameter based on manufacturer's recommendations or engineering analysis and submit those ranges, along with justification, for approval by the Administrator in an amended design plan. The proposed recordkeeping and reporting requirements for treatment systems are similar to those for control device temperature monitoring requirements already in the NSPS.

The EPA is considering and taking public comment on an alternative approach to defining landfill gas treatment and the corresponding monitoring requirements, as discussed in section IX.A of this preamble.

Uses of treated landfill gas. Subpart WWW allows landfill owners or operators the option of achieving compliance by routing the collected gas to a treatment system ''that processes the collected gas for subsequent sale or use.'' We propose to include language in subpart XXX (40 CFR 60.762(b)(2)(iii)(C)) to clarify that the use of treated landfill gas is not limited to use as a fuel for a stationary combustion device, as some people have previously interpreted this compliance option, but also includes other uses such as the production of vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process.

B. Startup, Shutdown and Malfunction Provisions

The general provisions in 40 CFR part 60 provide that emissions in excess of the level of the applicable emissions limit during periods of startup, shutdown and malfunction (SSM) shall not be considered a violation of the applicable emission limit *unless otherwise specified in the applicable standard* (see 40 CFR 60.8(c))(emphasis added). As reflected in the italicized language, an individual subpart can supersede this provision. In today's action, the EPA is proposing standards in subpart XXX that apply at all times, including periods of startup or shutdown, and periods of malfunction. In addition, to enable the EPA to determine the severity of an emissions exceedance for periods when the gas collection system or a control device is not operating, the EPA is proposing to add a recordkeeping and reporting requirement for landfill owners or operators to estimate emissions during such periods.

C. Closed Areas

To determine whether NMOC emissions from nonproductive areas of the landfill are less than 1 percent of the total landfill NMOC emissions (and hence controls are not required), subpart WWW relies on modeled (calculated) NMOC rates (see 40 CFR 60.759(a)(3)(ii)). To refine the measurements of these nonproductive areas, the EPA is proposing to allow owners or operators of landfills subject to subpart XXX to use measured or modeled flow of landfill gas to determine if an area is nonproductive. The EPA proposes that owners or operators of physically separated, closed areas of landfills subject to subpart XXX may use the procedures in proposed 40 CFR 60.764(b), which determine the flow rate of landfill gas using actual or modeled measurements, to determine NMOC emissions.

D. Surface Monitoring

Subpart WWW requires quarterly surface monitoring to demonstrate that the cover and gas collection system are working properly. The intent of the surface monitoring provision is to maintain a tight cover that minimizes landfill gas emissions through the landfill surface. In this proposal, we are reiterating the intent that landfills must monitor along a pattern that traverses the landfill at specified intervals and where visual observations indicate elevated concentrations of landfill gas, which includes all cover penetrations and openings within the area of the landfill where waste has been placed and a gas collection system is required. The EPA is also considering and taking public comment on revisions to the surface monitoring requirements, as discussed in section IX of this preamble.

E. Electronic Reporting

The EPA is proposing electronic reporting of required performance test reports, NMOC emission rate reports, and annual reports. We also propose that industry should be required to maintain only electronic copies of the records to satisfy federal recordkeeping requirements. The proposed electronic submission and storage procedures are

discussed in detail in section VIII.E of this preamble.

The proposal to submit performance test data electronically to the EPA applies only to those performance tests conducted using test methods that are supported by the Electronic Reporting Tool (ERT). At this time, most of the methods in the landfills NSPS are not supported by the ERT. Thus, electronic reporting of performance tests may not be required for some landfills initially, but will be required when applicable methods are added to the ERT. A listing of the pollutants and test methods supported by the ERT is available at: *http://www.epa.gov/ttn/chief/ert/index.html.*

F. Wellhead Monitoring Requirements

Subpart WWW addresses operational standards for wellheads. Under 40 CFR 60.753(c), landfill owners/operators may request and demonstrate a higher operating temperature, nitrogen, or oxygen value at a particular well. The EPA is clarifying in this preamble the intent of the following requirement: ''A higher operating value demonstration must be submitted to the Administrator for approval and must include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens.'' The demonstration must meet *both* criteria; that is a higher operating value must not cause fires *and* must not significantly inhibit anaerobic decomposition by killing methanogens.

The EPA proposes to clarify in subpart XXX that any alternate operating value for temperature, nitrogen, or oxygen proposed by an owner or operator according to the proposed 40 CFR 60.763(c) must be submitted to the Administrator (i.e., the EPA Administrator or delegated authority) for approval. The request may be submitted separately from a design plan revision. However, the design plan would have to be updated on the schedule described in the next section.

The EPA is also considering and taking comment on the landfill wellhead monitoring requirements, as discussed in the section IX.B of this preamble.

G. Requirements for Updating the Design Plan

We propose adding three criteria for when an affected source must update its design plan and submit it to the Administrator under subpart XXX (40 CFR 60.767(h)). We propose requiring submittal of a revised design plan as follows: (1) Within 90 days of expanding operations to an area not covered by the previously approved design plan; (2) prior to installing or expanding the gas collection system in a manner other than described in a previously approved design plan; and (3) prior to implementing an alternative operating parameter value for temperature, nitrogen, or oxygen.

H. Submitting Corrective Action Timeline Requests

Subpart WWW outlines the timeline for correcting for air infiltration in the gas collection system within 15 days of any exceedance of temperature, nitrogen, or oxygen parameters. We propose clarifying this requirement in subpart XXX (40 CFR 60.765(a)(5)) to require the landfill to submit an alternative corrective action timeline request to the Administrator if the landfill cannot correct for air infiltration within 15 calendar days of the initial exceedance and the landfill is unable to (or does not plan to) expand the gas collection within 120 days of the initial exceedance.

I. Other Corrections and Clarifications

We propose to standardize the terms ''control system'' and ''collection and control system'' throughout proposed subpart XXX in order to use consistent terminology throughout the regulatory text. Subparts Cc and WWW include phrases such as ''control or treatment system''; however, 40 CFR 60.752(b)(2)(iii) indicates that a treatment system described in 40 CFR 60.752(b)(2)(iii)(C) is considered to be a type of control system, and therefore the term ''control system'' is sufficient and more concise. Further, some other parts of subpart WWW refer to ''collection and control device'' or ''control equipment''; however, the terms ''device'' and ''equipment'' are synonymous with the term ''system'' in the context of these rules and were replaced with ''control system'' or ''control system equipment'' in several places as appropriate, for consistency. Finally, many parts of subpart WWW inaccurately reference ''control system'' instead of ''collection and control system'' when referring back to paragraphs in 40 CFR 60.752(b). These corrections and clarifications appear in subpart XXX.

We also propose to make the following clarifications and corrections to subpart XXX, which are consistent with the May 23, 2002 and September 8, 2006 proposed amendments in subpart WWW.

Consistent with the May 23, 2002 and September 8, 2006 proposed amendments, we propose to include language in subpart XXX to exempt owners/operators of boilers and process heaters with design capacities of 44 megawatts or greater from the requirement to conduct an initial performance test (40 CFR 60.762(b)(2)(iii)(B)).

Consistent with the September 8, 2006 proposed amendments, we propose to remove the term ''combustion'' from the requirement to monitor temperature of enclosed combustors (40 CFR 60.768(b)(2)(i) and 40 CFR 60.768(c)(1)(i)).

Consistent with the September 8, 2006 proposed amendments, we propose to incorporate a corrected test method cross-reference in 40 CFR 60.765(c)(3) of subpart XXX necessitated by the reorganization of Method 21 in appendix A to 40 CFR part 60.

Consistent with the September 8, 2006 proposed amendments, we propose to amend the definition of ''household waste'' and add a definition of ''segregated yard waste'' in subpart XXX (40 CFR 60.761) to clarify our intent regarding the applicability of the landfills NSPS to landfills that do not accept household waste, but accept segregated yard waste.

We are clarifying that the definition of ''Modification'' in subpart XXX includes a change in mass or volume and we are requesting comment on the definition of modification as discussed in section VIII.I of this preamble.

VIII. Rationale for the Clarifications and Resolutions That Are the Result of Implementation Activity

A. Definitions for Treated Landfill Gas and Treatment System and Treatment System Monitoring

Landfill gas treatment. In the May 23, 2002 proposed amendments, we proposed a definition for ''treatment system'' that would be used to determine if a facility qualifies for the treatment option provided in subpart WWW. The purpose of this definition was to provide consistency as to what qualifies as a treatment system and to reduce the burden on state and local agencies and EPA Regions currently performing case-by-case determinations related to the adequacy of treatment options being employed across the nation. The proposed definition of treatment system was ''a system that filters, de-waters, and compresses landfill gas.''

Following the May 23, 2002 proposal of the treatment system definition, several commenters requested further clarification as to what levels of filtration and de-watering would be considered acceptable to meet the definition of treatment. Some

commenters requested that EPA allow owners/operators to treat their gas such that it would meet the end-use combustion equipment ''manufacturer's requirements'' for fuel quality. Other commenters requested that EPA develop specific particulate, moisture, and compression targets that demonstrate ''treated landfill gas.''

We agreed with commenters that the definition of treatment system needed additional detail. We contacted manufacturers of combustion devices that are used to recover energy from landfill gas, and we obtained their written specifications and recommendations for fuel quality. As suggested by the commenters, we reviewed the available manufacturers' specifications for acceptable moisture and particulate levels. Because different manufacturers have different specifications, our proposed definition of ''treatment system'' did not refer directly to the manufacturers' requirements. Instead, we developed specific filtration and de-watering targets based on those requirements.

On September 8, 2006, we proposed levels of de-watering and filtration that were consistent with most manufacturers' specifications for landfill gas burned in energy recovery devices such as reciprocating engines, gas turbines, and boilers. We also proposed a supplemental definition of treatment system, as follows: ''. . . a system that has an absolute filtration rating of 10 microns or less, lowers the water dew point of the landfill gas by at least 20 degrees Fahrenheit with a de-watering process, and compresses the landfill gas.'' The term ''absolute filtration rating'' means the diameter of the largest hard spherical particle that would pass through the filter. These treatment levels would minimize degradation of the combustion device and promote proper destruction of NMOC.

Following the September 8, 2006 supplemental amendments, several commenters objected to the 20 °F dew point reduction requirement and the requirement to monitor temperature reduction across the moisture removal system. Commenters cited several reasons, including the following:

- In cold climates, it might not be feasible to meet the proposed definition because the gas can be cooled from wellhead to temperatures in the 40 °F-range simply because of ambient conditions, and lowering the temperature further is not feasible.
- Verifying inlet and outlet temperatures is difficult because they vary depending on the pressures in the system. Accounting for these conditions could require multiple points of measure plus use of an algorithm to determine the reduction.
- The proposed standard does not take into account water removal that may be occurring in other parts of the gas collection system, such as the header.
- The level of treatment needed depends on the type and design of the specific combustion equipment being used, so some commenters favored case-by-case determinations.

The EPA maintains the position that the intent of the treatment option is to require active lowering of the dew point consistent with the better available treatment systems, and that we did not intend knock-out pots (for example) to qualify. The numerical specifications ensure that the treated gas is suitable for use in a wide range of applications. They also allow uniform national application of the NSPS, provide certainty to the landfill industry and regulated agencies, and avoid case-by-case determinations that are likely to be complex, time-consuming, and yield inconsistent results.

However, the EPA agrees with the comments that the 2006 proposed 20 °F dew point reduction requirement contains some ambiguity. For example, is the 20 °F relative to the gas temperature at the wells, in the main header prior to compression, or just prior to the chiller? Does the gas need to be chilled 20 °F below atmospheric temperature, which could be impractical in cold climates? We also agree with the commenters that if the treatment system first compresses and then chills the gas, measuring the gas temperature before the compressor and after the chiller would not give an accurate indication of the dew point reduction due to the change in pressure, and algorithms would be required to calculate the reduction.

In light of these comments, we reviewed designs from manufacturers of gas treatment compression-dehydration skids for the landfill gas utilization industry to determine if the numerical moisture requirement could be expressed as an absolute dew point or temperature that could be measured at a single location, rather than requiring a 20 °F reduction. Such a requirement would eliminate ambiguity and make it easier for landfills and regulatory agencies to determine compliance. Manufacturers commonly compress the gas first and then cool the gas to reduce the dew point. Manufacturers commonly offer dew points of 38 to 45 °F. They also reheat the final dehydrated product prior to it leaving their treatment unit. Therefore, we propose a dew point reduction to 45 °F, rather than a reduction by 20 °F.

The EPA requests comments on all aspects of this proposed definition of landfill gas treatment.

Continuous monitoring. To ensure continuous compliance with the treatment option, we are proposing similar monitoring requirements to the September 8, 2006 supplemental proposal, except that temperature or dew point is measured at a single location to determine that it has been reduced to 45 °F, rather than measuring it before and after the moisture removal device. Landfill owners/operators would install instrumentation to continuously monitor pressure drop across a filter, temperature for a chiller-based de-watering system, and dew point for a non-chiller-based de-watering system. These requirements would ensure that the treatment system is continuously operating in the manner in which it was designed to operate to achieve the specific filtration, de-watering, and compression targets that define a treatment system for the purposes of the landfills NSPS.

Continuous monitoring is appropriate for treatment systems because it ensures timely identification of sudden failures in equipment such as chillers and filters and ensures that treatment systems are operating properly to achieve the filtration and de-watering levels specified in the rule. Continuous monitoring is available for the selected treatment system operating parameters and is required to ensure continuous compliance.

For filtration systems, the pressure drop (24-hour average) across the filter would be continuously monitored and maintained above the minimum pressure drop established by engineering analysis or manufacturer's specifications. Alternatively, the owners/operators can request approval to monitor another parameter that indicates proper performance of the filtration system. Pressure drop was selected as a monitoring parameter because it is a good indicator of proper filter operation. A noticeable reduction in pressure drop across the filter indicates a breach of the filter material.

Continuous monitoring of temperature for a chiller-based de-watering system, dew point from a de-watering system that is not chiller-based, or another approved parameter that is indicative of proper performance of the de-watering system, would also be required. If the owner/operator requests to measure a parameter other than temperature or dew point, then the monitored parameter (24-hour average) would have to be kept within the operating range established by engineering analysis or manufacturer's

specifications. The owner or operator would submit the treatment system design and justification for the operating parameter ranges for approval by the Administrator in the design plan required by 40 CFR 60.752(b)(2) of subpart WWW.

For chiller-based de-watering systems, we selected temperature as a monitoring parameter because it indicates that the chiller is operating properly and the target 45 °F dew point is achieved. Continuous measurement of the gas temperature at the chiller outlet is required. The temperature measurement device should be located at (or immediately after) the coalescing filter or other direct contact moisture removal device that follows the chiller and removes the condensed moisture. Because the gas will be saturated at the temperature it leaves the filter, the temperature in that location is a good measure of the dew point. Temperature monitors are readily available, commonly used, reliable, and less expensive than alternative monitoring systems.

If a de-watering system that is not based on chilling, for example, a desiccant system, is used, then temperature would not be an appropriate parameter to monitor. In such cases, monitoring of the dew point would indicate whether the system is operating properly to achieve a temperature of 45 °F. Dew point can be continuously monitored using a hygrometer with a dew point readout. The hygrometer should be located after the equipment that performs the moisture removal. Dew point monitors are available and suitable for landfill gas applications.

Data collection is required at 15-minute intervals, consistent with current landfills NSPS requirements for flare pilot flame monitoring and enclosed combustor temperature monitoring that apply to landfills that opt to comply with the control options rather than the treatment option. A 24-hour block average for determining compliance with the treatment system operating parameter limits is sufficient to indicate any significant change in treatment system operation and would be less burdensome than more frequent averaging. Owners or operators of treatment systems would be required to report periods when the 24-hour block average for a monitored parameter (e.g., pressure drop, temperature, dew point) is outside the operating range established in the approved design plan.

Compliance schedule. Landfills subject to subpart XXX that choose to comply with subpart XXX by treating the landfill gas according to 40 CFR 60.762(b)(2)(iii)(C) would comply with the treatment requirements upon choosing to control landfill gas using the treatment option.

Uses of Treated Landfill Gas. Subpart WWW allows landfill owners or operators the option of achieving compliance by routing the collected gas to a treatment system ''that processes the collected gas for subsequent sale or use.'' We propose language in subpart XXX (40 CFR 60.762(b)(2)(iii)(C)) to clarify that the use of treated landfill gas is not limited to use as a fuel for a stationary combustion device as some have interpreted the provision. We clarify the intent of the treatment option to allow other beneficial uses such as vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process. Newer uses of landfill gas are being implemented and result in the production of useful energy or products, reducing the use of fossil fuels or other raw materials and the associated emissions. For the uses mentioned, the gas is treated at least as well as the specified treatment requirements. Site-specific approval of alternative monitoring parameters would be required for uses other than combustion because treatment systems for these end uses are relatively few in number and have unique designs. Owners or operators would be required to apply for approval of monitoring parameters.

B. Startup, Shutdown and Malfunction Provisions

In its 2008 decision in *Sierra Club* v. *EPA,* 551 F.3d 1019 (D.C. Cir. 2008), *cert. denied,* 130 S. Ct. 1735 (U.S. 2010), the United States Court of Appeals for the District of Columbia Circuit vacated portions of two provisions in the EPA's CAA section 112 regulations governing the emissions of HAP during periods of SSM. Specifically, the Court vacated the SSM exemption contained in 40 CFR 63.6(f)(1) and 40 CFR 63.6(h)(1), holding that under CAA section 302(k), emissions standards or limitations must be continuous in nature and that the SSM exemption violates the CAA's requirement that some CAA section 112 standards apply continuously.

Periods of startup or shutdown. Consistent with *Sierra Club* v. *EPA* (551 F.3d 1019 (D.C. Cir. 2008)), the EPA has established standards in subpart XXX that apply at all times. The part 60 general provisions, which define startup, shutdown and malfunction, were written for typical industrial or manufacturing sources and associated processes. Many of these sources and processes may, at times, be shut down entirely for clean-out, maintenance, or repairs, and then restarted. Applying the standards at all times, including periods of startup and shutdown, is intended to minimize excess emissions when the source or process ceases operation or commences operation, or malfunctions. Landfill emissions, however, are produced by a continuous biological process that cannot be stopped or restarted. For landfills, the primary SSM concern is with malfunction of the landfill GCCS and associated monitoring equipment, not with the startup or shutdown of the entire source. Thus, SSM provisions in the subpart XXX focus primarily on malfunction of the gas collection system, gas control system, and gas treatment system, which is part of the gas control system.

Periods of malfunction. Periods of startup, normal operations, and shutdown are all predictable and routine aspects of a source's operations. However, by contrast, malfunction is defined as ''any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions'' (40 CFR 60.2). The EPA has determined that CAA section 111 does not require that emissions that occur during periods of malfunction be factored into development of CAA section 111 standards. Nothing in CAA section 111 or in case law requires that the EPA anticipate and account for the innumerable types of potential malfunction events in setting emission standards. CAA section 111 provides that the EPA set standards of performance which reflect the degree of emission limitation achievable through ''the application of the best system of emission reduction'' that the EPA determines is adequately demonstrated. A malfunction is a failure of the source to perform in a ''normal or usual manner'' and no statutory language compels the EPA to consider such events in setting standards based on the ''best system of emission reduction.'' The ''application of the best system of emission reduction'' is more appropriately understood to include operating units in such a way as to avoid malfunctions.

Further, accounting for malfunctions in setting emission standards would be difficult, if not impossible, given the myriad different types of malfunctions that can occur across all sources in the category and given the difficulties associated with predicting or accounting for the frequency, degree, and duration of various malfunctions that might

occur. As such, the performance of units that are malfunctioning is not ''reasonably'' foreseeable. See, e.g., *Sierra Club* v. *EPA,* 167 F.3d 658, 662 (D.C. Cir. 1999) (''The EPA typically has wide latitude in determining the extent of data-gathering necessary to solve a problem. We generally defer to an agency's decision to proceed on the basis of imperfect scientific information, rather than to 'invest the resources to conduct the perfect study.' '') See also, *Weyerhaeuser* v. *Costle,* 590 F.2d 1011, 1058 (D.C. Cir. 1978) (''In the nature of things, no general limit, individual permit, or even any upset provision can anticipate all upset situations. After a certain point, the transgression of regulatory limits caused by 'uncontrollable acts of third parties,' such as strikes, sabotage, operator intoxication or insanity, and a variety of other eventualities, must be a matter for the administrative exercise of case-by-case enforcement discretion, not for specification in advance by regulation.''). In addition, emissions during a malfunction event can be significantly higher than emissions at any other time of source operation and thus accounting for malfunctions could lead to standards that are significantly less stringent than levels that are achieved by a well-performing non-malfunctioning source. It is reasonable to interpret CAA section 111 to avoid such a result. The EPA's approach to malfunctions is consistent with CAA section 111 and is a reasonable interpretation of the statute.

In the event that a source fails to comply with the applicable CAA section 111 standards as a result of a malfunction event, the EPA would determine an appropriate response based on, among other things, the good faith efforts of the source to minimize emissions during malfunction periods, including preventative and corrective actions, as well as root cause analyses to ascertain and rectify excess emissions. The EPA would also consider whether the source's failure to comply with the CAA section 111 standard was, in fact, ''sudden, infrequent, not reasonably preventable'' and was not instead ''caused in part by poor maintenance or careless operation'' (40 CFR 60.2 (definition of malfunction)).

Further, to the extent the EPA files an enforcement action against a source for violation of an emission standard, the source can raise any and all defenses in that enforcement action and the federal district court will determine what, if any, relief is appropriate. The same is true for citizen enforcement actions. Similarly, the presiding officer in an administrative proceeding can consider any defense raised and determine whether administrative penalties are appropriate.

In several prior rules, the EPA had included an affirmative defense to civil penalties for violations caused by malfunctions in an effort to create a system that incorporates some flexibility, recognizing that there is a tension, inherent in many types of air regulation, to ensure adequate compliance while simultaneously recognizing that despite the most diligent of efforts, emission standards may be violated under circumstances entirely beyond the control of the source. Although the EPA recognized that its case-by-case enforcement discretion provides sufficient flexibility in these circumstances, it included the affirmative defense to provide a more formalized approach and more regulatory clarity. See *Weyerhaeuser Co.* v. *Costle,* 590 F.2d 1011, 1057–58 (D.C. Cir. 1978) (holding that an informal case-by-case enforcement discretion approach is adequate); but see *Marathon Oil Co.* v. *EPA,* 564 F.2d 1253, 1272–73 (9th Cir. 1977) (requiring a more formalized approach to consideration of ''upsets beyond the control of the permit holder''). Under the EPA's regulatory affirmative defense provisions, if a source could demonstrate in a judicial or administrative proceeding that it had met the requirements of the affirmative defense in the regulation, civil penalties would not be assessed. Recently, the United States Court of Appeals for the District of Columbia Circuit vacated such an affirmative defense in one of the EPA's section 112(d) regulations. *NRDC* v. *EPA,* No. 10–1371 (D.C. Cir. April 18, 2014) 2014 U.S. App. LEXIS 7281 (vacating affirmative defense provisions in section 112(d) rule establishing emission standards for Portland cement kilns). The court found that the EPA lacked authority to establish an affirmative defense for private civil suits and held that under the CAA, the authority to determine civil penalty amounts lies exclusively with the courts, not the EPA. Specifically, the Court found: ''As the language of the statute makes clear, the courts determine, on a case-by-case basis, whether civil penalties are 'appropriate.' '' See NRDC, 2014 U.S. App. LEXIS 7281 at *21 (''[U]nder this statute, deciding whether penalties are 'appropriate' in a given private civil suit is a job for the courts, not EPA.''). In light of NRDC, the EPA is not including a regulatory affirmative defense provision in this rulemaking. As explained above, if a source is unable to comply with emissions standards as a result of a malfunction, the EPA may use its case-by-case enforcement discretion to provide flexibility, as appropriate. Further, as the D.C. Circuit recognized, in an EPA or citizen enforcement action, the court has the discretion to consider any defense raised and determine whether penalties are appropriate. Cf. NRDC, 2014 U.S. App. LEXIS 7281 at *24. (arguments that violation were caused by unavoidable technology failure can be made to the courts in future civil cases when the issue arises). The same logic applies to EPA administrative enforcement actions.

Limit on SSM duration. Subpart WWW limits the duration of SSM events to 5 days for the landfill gas collection system and 1 hour for treatment or control devices. Proposed subpart XXX does not include the 5-day and 1-hour time limitations because some malfunctions cannot be corrected within these timeframes. Excluding these provisions is consistent with *Sierra Club* v. *EPA* (551 F.3d 1019 (D.C. Cir. 2008)), which concluded that that emission standards apply at all times, including periods of SSM, and 40 CFR 60.11(d), which states that at all times, including periods of startup, shutdown and malfunction, owners or operators shall, to the extent practicable, maintain and operate any source facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. The proposed revisions clarify that the NSPS standards continue to apply during periods of SSM.

To prevent free venting of landfill gas to the atmosphere during control device malfunctions, we propose to include a requirement in subpart XXX (40 CFR 60.763(e)) that states that in the event the collection or control system is not operating, the gas mover system must be shut down and all valves in the collection and control system contributing to venting of gas to the atmosphere must be closed within 1 hour. Note that 40 CFR 60.753(e) of subpart WWW says ''inoperable.'' This provision was written when there was an allowance for periods of SSM: Subpart WWW (40 CFR 60.755(e)) allows SSM periods of 5 days for the landfill gas collection system and 1 hour for periods when collection or control devices were ''not operable'' due to malfunction. During those periods, the emission standards do not apply. However, proposed subpart XXX states that the standards apply at all times, including periods of SSM, and there is no allowance for SSM periods. Thus,

the term ''inoperable'' no longer applies. The EPA proposes to use the term ''not operating,'' which includes periods when the gas collection or control system is not operating for whatever reason, including when the gas collection or control system is inoperable.

The practice to shut down the gas mover equipment and all valves contributing to venting of gas to the atmosphere minimizes emissions from the landfill while the control system is not operating and is being repaired. Compliance with 40 CFR 60.763(e) does not constitute compliance with the applicable standards in 40 CFR 60.762. Compliance with 40 CFR 60.763(e) is necessary to demonstrate compliance with the general duty to minimize emissions in 40 CFR 60.11(d) during control or collection system malfunctions.

Under subpart XXX, landfill owners/operators must keep records of combustion temperature, bypass flow, and periods when the flare flame or the flare pilot flame is out. However, without additional provisions, the EPA would have no way to gauge the severity of an emissions exceedance that may occur when these operating parameters are not being met or when the control device is not operating. Therefore, the EPA is including provisions for landfill owners/operators to estimate NMOC emissions when the control device or collection system is not operating. The landfill owners/operators may use whatever information is available to estimate NMOC emissions during the period, including but not limited to, landfill gas flow to or bypass of the control device, the concentration of NMOC (from the most recent performance test or from AP–42), and the amount of time the control device is not operating. Landfill owners/operators would keep records of the estimated emissions and would report the information in the annual compliance report. (See provisions in proposed subpart XXX: 60.767(f)(7) and 60.768(c)(5).)

C. Closed Areas

In the September 8, 2006 proposed amendments, the EPA requested public comments on how to address closed areas of landfills and when to allow removal of controls. Under 40 CFR 60.759(a)(3)(ii) of subpart WWW, landfills owners/operators can exclude from control, provided that the total NMOC emissions of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill.

As discussed in the September 8, 2006 proposed amendments (71 FR 53277), it has come to our attention that there are situations in which the quantity of gas production has greatly declined in separate closed areas of some landfills, and the methane content has fallen such that the area is producing insufficient gas to properly operate a GCCS and control device. Actual measurements may show that the quantity of landfill gas from the area is less than 1 percent of the total gas from the entire landfill, but using the first order decay equation, it is calculated to be greater than 1 percent of the total gas from the entire landfill.

The EPA proposes in subpart XXX that owners or operators of physically separated, closed areas of landfills may use the procedures in 40 CFR 60.764(b), which determine the flow rate of landfill gas using actual measurements, to determine NMOC emissions. Alternatively, owners or operators of physically separated, closed areas may use subpart XXX (40 CFR 60.769(a)(3)(ii)), which relies on modeled (calculated) NMOC rates. The EPA proposes to allow the use of actual flow measurements because using actual flow measurements yields a more precise measurement of NMOC emissions for purposes of determining if NMOC emissions from the closed, nonproductive area of the landfill are less than 1 percent of the total NMOC emissions from the entire landfill. Landfills would be allowed to stop collecting gas from the closed separated area if it accounts for less than 1 percent of total landfill NMOC emissions.

The measurement approach would be allowed only in closed areas that are physically separated from other parts of the landfill (e.g., with liners). If the closed area is not separated, gas can migrate between that area and the rest of the landfill. In such a situation, measurements might not accurately reflect emissions from the given landfill area because gas could be moving underground and escaping or being collected from an adjacent section of the landfill.

D. Surface Monitoring

The landfills NSPS requires quarterly surface monitoring to demonstrate that the cover and gas collection system are working properly. The intent of the surface monitoring provision is to maintain a tight cover that minimizes the migration of emissions through the landfill surface. The operational requirements in subpart WWW specify that the landfill must ''operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover.''

Several commenters on the September 8, 2006 notice asserted that the monitoring of every cover penetration was unnecessary or too burdensome. One commenter believed quarterly monitoring of penetrations was needed and suggested rule amendments to require the surface monitoring be conducted not only in areas where distressed vegetation and cracks or seeps in the cover can be seen, but also in other areas such as at the base of gas collection wells or at the top of the gas collection boot.

In proposed subpart XXX, we are reiterating the position that landfills must monitor all cover penetrations and openings within the area of the landfill where waste has been placed and a gas collection system is required. Specifically, landfill owners/operators must conduct surface monitoring at 30-meter intervals and where visual observations indicate elevated concentrations of landfill gas. Cover penetrations can be observed visually and are clearly a place where gas would be escaping from the cover, so monitoring of them is required by the regulatory language. The regulatory language gives distressed vegetation and cracks as an example of a visual indication that gas may be escaping, but this example does not limit the places that should be monitored by landfill staff or by enforcement agency inspectors. Thus, the landfill must monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required. The EPA is clarifying this intent in 40 CFR 60.763(d), as follows: Owners/operator must also monitor ''* * * where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations.''

Regarding how to monitor landfill surfaces including surface penetrations, subpart XXX states that surface emission monitoring must be performed in accordance with section 8.3.1 of Method 21 of appendix A of part 60, except that the probe must be placed within 5 to 10 centimeters of the ground.

E. Electronic Reporting

Through this proposal, the EPA is presenting a process to increase the ease and efficiency of data submittal and improve data accessibility. Specifically, the EPA is proposing that owners or operators of MSW landfills submit electronic copies of required performance test reports, NMOC emission rate reports, and annual reports by direct computer-to-computer electronic transfer through the EPA's Central Data Exchange (CDX) using the Compliance and Emissions Data Reporting Interface (CEDRI).

The CDX is the EPA's portal for submittal of electronic data. The EPA-provided ERT software is used to generate electronic reports of performance tests that will be uploaded into the CDX using the CEDRI. NMOC emission rate reports and annual reports will be submitted using subpart specific forms in the CEDRI. The submitted report package will be stored in the CDX archive (the official copy of record) and the EPA's public database called WebFIRE. All stakeholders will have access to all reports and data in WebFIRE and accessing these reports and data will be very straightforward and easy (see the WebFIRE Report Search and Retrieval link at *http://cfpub.epa.gov/webfire/index.cfm?action=fire.searchERTSubmission*). A description and instructions for use of the ERT can be found at *http://www.epa.gov/ttn/chief/ert/index.html* and CEDRI can be accessed through the CDX Web site (*http://www.epa.gov/cdx*). A description of the WebFIRE database is available at: *http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main.*

Electronic data transmittal and reporting is becoming an increasingly common element of modern life (as evidenced by electronic banking and income tax filing). Electronic reporting of environmental data is also common practice in many media offices at the EPA; programs such as the Toxics Release Inventory (TRI), the Greenhouse Gas Reporting Program, Acid Rain and NO_X Budget Trading Programs, and the Toxic Substances Control Act (TSCA) new chemical program all require electronic submissions to the EPA. The changes being proposed today are needed to continue the transition to electronic reporting. Under current requirements, paper reports are often stored in filing cabinets or boxes, which make the reports more difficult to obtain and use for data analysis and sharing. Electronic storage of such reports would make data more accessible for review, analyses, and sharing. Electronic reporting can eliminate paper-based, manual processes. This will save time and resources, simplify data entry, eliminate redundancies, and provide data quickly and accurately to the affected sources, air agencies, the EPA, and the public.

Under an electronic reporting system, the EPA would have air emissions and performance test data in hand; thus, it is possible that fewer or less substantial information collection requests (ICRs) in conjunction with prospective CAA-required technology and risk-based reviews may be needed. This may result in a decrease in the need for industry staff time to respond to data collection requests.

Affected sources could also see reduced costs as a result of electronic reporting. The electronic reporting system forms will contain only the data elements specified by the regulations. As such, the data required to be included in each report will be clearly spelled out, reducing the time spent in determining required data elements and eliminating the time spent on including unnecessary data. The time savings realized by making the reports standardized could reduce facility costs. Reducing the reporting burden is also achieved through labor savings because some of the required data are already in existing EPA databases and do not need to be submitted again. Existing source files can be reused and already contain a portion of the required data. Electronic reporting could minimize submission of unnecessary or duplicative reports in cases where facilities report to multiple government agencies and the agencies opt to rely on the EPA's electronic reporting system to view report submissions. Where air agencies continue to require a paper copy of these reports and will accept a hard copy of the electronic report, facilities will have the option to print paper copies of the electronic reporting forms to submit to the air agencies, thus minimizing the time spent reporting to multiple agencies. Additionally, maintenance and storage costs associated with retaining paper records could likewise be minimized by replacing those records with electronically submitted data and reports.

Air agencies could benefit from more streamlined and automated review of the electronically submitted data. For example, because the performance test data would be readily-available in a standard electronic format, air agencies would be able to review reports and data electronically rather than having to conduct a review of the reports and data manually. Having reports and associated data in electronic format will facilitate review through the use of software ''search'' options, as well as the downloading and analyzing of data in electronic format. Additionally, air agencies would benefit from the reported data being accessible to them through the EPA's electronic reporting system wherever and whenever they want or need access (as long as they have access to the Internet).

The general public would also benefit from electronic reporting of emissions data because the data would be available for viewing sooner and would be easier for the public to access. The EPA Web site that stores the submitted electronic data will be easily accessible to the public and will provide a user-friendly interface that any stakeholder could access.

Another advantage to electronic reporting is that it makes data that can be used for the development of emission factors more readily available. An emission factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant (*e.g.,* kilograms of particulate emitted per megagram of coal burned). Such factors facilitate estimation of emissions from various sources of air pollution and are an important tool in developing emissions inventories, which in turn are the basis for numerous efforts including trends analysis, regional and local scale air quality modeling, regulatory impact assessments, and human exposure modeling. In most cases, emission factors are simply averages of all available data regardless of the data quality, and they are generally assumed to be representative of long-term averages for all facilities in the source category (*i.e.,* a population average).[26]

The EPA has received feedback from stakeholders asserting that many of the EPA's emission factors are outdated or not representative of a particular industry emission source. While the EPA believes that the emission factors are suitable for their intended purpose, we also recognize that emissions profiles on different pieces of equipment can change over time due to a number of factors (fuel changes, equipment improvements, industry work practices), and it is important for emission factors to be updated to keep up with these changes. The EPA is currently pursuing emission factor development improvements that include procedures to incorporate the source test data that we are proposing be submitted electronically. By requiring

[26] For more information on emission factors and their uses, see: *http://www.epa.gov/ttnchie1/ap42/.*

the electronic submission of the reports identified in this proposed action, the EPA would be able to access and use the submitted data to update emission factors more quickly and efficiently, creating factors that are characteristic of what is currently representative of the industry sector. Likewise, an increase in the number of test reports used to develop the emission factors will provide more confidence that the factor is of higher quality and representative of the whole industry sector. The EPA's new emission factor development procedures (*http://www.epa.gov/ttn/chief/efpac/procedures/index.html*) that incorporate the use of electronic test data automatically perform routines to indicate when a factor is no longer representative of an industry sector based on current data and calculates an updated factor. Because these routines are run automatically, the process is quick, and we are able to provide representative factors sooner. Emission factors are used in the development of emissions inventories, and as such, improved emission factors means that the quality of these inventories will be improved on a much quicker scale than they would under the current paper reporting requirements.

The electronic reporting system will also result in information that is submitted in a standardized format. Standardizing the reporting format will require the reporting of specific data elements, thereby helping to ensure completeness of the data and allowing for accurate assessment of data quality. In the past, incomplete test reports have resulted in lower quality emission factors because the data could not be adequately reviewed to determine representativeness. Imbedded quality assurance checks will perform some of the required method calculations, reducing errors in test reports. The system will perform statistical analyses routines to evaluate below detection limit data and outliers prior to performing the emission factor calculations. The result will be a factor of the highest quality rating that is most representative for the source category. And because the system is entirely electronic, it eliminates transcription errors in moving data from paper reports to data systems for analysis. These quality assurance checks and procedures will increase the accuracy of test report data, improve the overall quality of test data, and lead to more accurate emission factors and higher quality emissions inventories. These features benefit all users of the data.

Because those records, data, and reports that will be required to be submitted to the EPA electronically will be stored safely and will be available to all stakeholders at all times, we propose that industry should be required to maintain only electronic copies of these records to satisfy federal recordkeeping requirements. Thus, in this rulemaking, we are proposing to eliminate the requirement to maintain hard copies of records, data, and reports submitted to the EPA's CDX. This provision will benefit industry sources that currently maintain these reports in hardcopy form; no more rooms of file cabinets to store these reports will be needed, while maintaining the accessibility of this information on site. We note, however, that air agencies that require submission of reports in hardcopy form may also require hardcopy records.

We plan to store records, data, and reports submitted to the EPA's CDX electronically in two sites (CDX and WebFIRE), with frequent backups. Upon submission of a report, CEDRI will archive a copy of each submitted report in the CDX (this copy becomes the official copy of record). Both WebFIRE and CDX backup their files on a daily basis. The EPA's National Computer Center (where the WebFIRE files are stored) maintains a dual back-up file (one kept on site and the other stored off site). The CDX also employs a dual backup system to avoid problems in the event of a catastrophe at the location of the servers storing the files. Thus, the EPA has established redundancy into the electronic reporting and storage system to ensure submitted data are retained. In summary, in addition to supporting regulation development, control strategy development, and other air pollution control activities, having an electronic database populated with these reports would save industry; state, local, and tribal agencies; and the EPA significant time, money, and effort while also improving the quality of emission inventories and, as a result, air quality regulations.

F. Wellhead Monitoring Requirements

During implementation of subpart WWW, the question has been raised about whether a landfill needs agency approval to establish higher operating values for temperature, nitrogen, or oxygen as allowed under subpart WWW (40 CFR 60.753(c)). Subpart WWW (40 CFR 60.752(b)(2)(1)(B)) specifically states that the design plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping, or reporting provisions of subpart WWW proposed by the owner or operator. Therefore, the EPA is confirming in subpart XXX that alternative values allowed for under subpart XXX (40 CFR 60.763(c)) should be submitted for approval by the Administrator or the delegated state authority and then, after it is approved, submitted again to the Administrator or the delegated state authority as part of a design plan revision.

Another question has been raised during implementation concerning supporting data requirements for the allowance of an elevated wellfield monitoring parameter. The EPA is clarifying its intent in subpart XXX (40 CFR 60.763(c)), such that the demonstration must meet this criteria: A higher operating value must not cause fires and must not significantly inhibit anaerobic decomposition by killing methanogens.

G. Requirements for Updating Design Plan

Currently subpart WWW does not directly specify when a design plan should be updated and submitted to the Administrator for approval. To clarify questions received during implementation on the timing of submittals of updated design plans, we are proposing in subpart XXX to outline a set of three criteria under a consolidated section 40 CFR 60.767(h) for when a design plan must be submitted for approval. A revised design plan must be submitted for approval: Within 90 days of expanding operations to an area not covered by the previously approved design plan; before installing or expanding the gas collection system in a way that is not consistent the previous design plan; and prior to implementing an approved alternative operating parameter value for temperature, nitrogen, or oxygen, if the owner or operator has requested alternative operating parameter values.

The EPA is proposing to maintain the same site-specific design plan review and approval procedures, recognizing the unique site-specific topography, climate and other factors affecting the design of a GCCS. However, the EPA solicits comment on ways to streamline the design plan submission and approval procedures as part of its review of this NSPS. Examples of streamlining may include the potential development of a process by which approved alternative operating parameters could be automatically linked to updates of design plans or development of a process by which alternative operating parameters and updated design plans could be approved on a similar schedule.

H. Submitting Corrective Action Timeline Requests

During implementation of subpart WWW, the question has been raised about whether a landfill needs agency approval of corrective action timelines that exceed 15 calendar days but are less than the 120 days allowed for installing a GCCS. The intent of the rule is to require agency approval of corrective action timelines only if a landfill does not fix an exceedance in 15 days and is unable to or does not plan to expand the gas collection system within 120 days. We have included provisions in subpart XXX (40 CFR 60.765(a)(5)) to clarify this point. Excluding system expansion, all other types of corrective actions expected to exceed 15 calendar days should be submitted to the agency for approval of an alternate timeline. In addition, if a landfill owner or operator expects the system expansion to exceed the 120-day allowance period, it should submit a request and justification for an alternative timeline. We have not proposed a specific schedule for submitting these requests for alternative corrective action timelines because investigating and determining the appropriate corrective action, as well as the schedule for implementing the corrective action, will be site specific and depend on the reason for the exceedance. We clarify that a landfill should submit an alternative time line request as soon as possible (i.e., as soon as they know that they would not be able to correct the exceedance in 15 days or expand the system in 120 days) to avoid being in violation of the rule. If the landfill waits until 120 days after the exceedance to submit an alternative time line, then by the time the regulatory agency has the chance to review the time line and determine if it is approvable, the landfill will already be in violation of the requirement to expand the system within 120 days. After submitting the alternative timeline request, the landfill should work with its permitting authority to communicate the reasons for the exceedances, status of the investigation, and schedule for corrective action.

To address implementation concerns associated with the time allowed for corrective action, the EPA requests comment on an alternative that extends the requirement for notification from 15 days to as soon as practicable, but no later than 60 days. Many requests for an alternative compliance timeline express the need for additional time to make necessary repairs to a well that requires significant construction activities. Extending the time period to as soon as practicable, but no later than 60 days may reduce the burden and ensure sufficient time for correction. If the EPA were to extend the time period to as soon as practicable, but no later than 60 days, then the EPA is also considering the removal of the provision to submit an alternative timeline for correcting the exceedance. Thus, by no later than day 60, the landfill would have to either have completed the adjustments and repairs necessary to correct the exceedance, or be prepared to have the system expansion completed by day 120. The EPA is also requesting input on whether 60 days is the appropriate amount of time that would allow owners or operators to make the necessary repairs.

I. Other Corrections and Clarifications

The clarifications and provisions described in this section apply to new subpart XXX. During implementation of subpart WWW, the EPA learned about potential confusion in the rule caused by the terms ''control and treatment system'' and ''control system.'' It was requested that the EPA revise the term ''control or treatment system'' to read ''control system.'' We agree that the term treatment system is a subset of the control system as described in subpart WWW (40 CFR 60.752(b)(2)(iii)(C)) and are proposing to make this change in proposed subpart XXX. While making this change, we also conducted an extensive review of the remainder of the rule text to make several editorial and consistency changes to how the terms ''control system'' and ''collection and control system'' were used. As part of this review, we clarified our intent for the terms ''device'' and ''equipment'' to be used interchangeably with ''system'' in the context of the landfills NSPS; and we are proposing to replace these terms with ''system'' in several places, as appropriate, for consistency. We also identified editorial inconsistencies in the use of how the terms ''control system'' and ''collection and control system'' were referenced and we are proposing in subpart XXX to change the text to reference the correct term, consistent with the intent of the rule text.

We propose to include language in subpart XXX to exempt owners or operators of boilers and process heaters with design capacities of 44 megawatts or greater from the requirement to conduct an initial performance test. Available data demonstrate that boilers and process heaters with heat input capacities of 44 megawatts or greater consistently achieve the required level of control, and the exemption of these boilers from testing has been included in several other air regulations, such as those for the chemical industry and petroleum refineries.

We propose to apply new language in subpart XXX (40 CFR 60.768(b)(2)(i) and 40 CFR 60.768(c)(1)(i)) by removing the term ''combustion'' from the requirement to monitor temperature of enclosed combustors. The amendment clarifies that the ''combustion'' temperature does not have to be monitored, because, for some enclosed combustors, it is not possible to monitor temperature inside the combustion chamber to determine combustion temperature. Instead, temperature can be monitored at another location, as long as the monitored temperature relates to proper operation of the enclosed combustor.

We propose to include a corrected test method cross-reference in subpart XXX (40 CFR 60.765(c)(3)) necessitated by the reorganization of Method 21 in appendix A to 40 CFR part 60.

We propose to include definitions of ''household waste'' and ''segregated yard waste'' in subpart XXX (40 CFR 60.761) to clarify our intent regarding the applicability of subpart XXX to landfills that do not accept household waste, but accept segregated yard waste. We intend for subpart XXX to apply to municipal solid waste landfills that accept general household waste (including garbage, trash, sanitary waste), as indicated in the definitions. We did not intend these rules to apply to landfills that accept only segregated yard waste and non-household waste such as construction and demolition and yard waste.

We are clarifying the definition of ''Modification'' in subpart XXX to include an increase in the permitted design capacity in terms of not only the volume, but also the mass.

The EPA is exploring options to achieve additional emissions reductions from existing landfills under CAA section 111(d) in an ANPRM. The EPA will consider all of the information it receives in response to the ANPRM in the context of its review of the NSPS and will respond to that information accordingly. In light of our interest in valuing methane reductions in our review of these standards as well as the number of cost-effective measures for existing landfills described in the ANPRM, the EPA is also exploring whether it is reasonable to review the definition of modification for landfills. A revision to the definition may provide additional opportunities to apply cost-effective measures to mitigate landfill gas emissions in modified sources because of the close relationship of control strategies that may apply to both modified landfills and existing sources.

The EPA requests comment on changes that may be appropriate and whether these changes should be enacted to achieve additional emissions reductions.

IX. Request for Comment on Specific Provisions

The EPA is specifically requesting public comment on three issues: Landfill gas treatment, wellhead monitoring, and enhanced surface monitoring.

A. Definitions for Treated Landfill Gas and Treatment System and Treatment System Monitoring

The EPA is requesting public comment on an alternative approach for defining treatment system and treated landfill gas. The alternative approach would define *Treated landfill gas* as landfill gas processed in a treatment system according to subpart XXX and would define *Treatment system* as a system that filters, de-waters, and compresses landfill gas. The alternative approach would be available for only new landfills subject to subpart XXX that treat the landfill gas for subsequent sale or beneficial use. The EPA is considering providing this flexibility for new landfills that beneficially use landfill gas, given the site-specific and end-use specific treatment requirements for different energy recovery technologies. The EPA is also requesting comment on providing this flexibility for all landfills. Most landfills that beneficially use landfill gas either combust the landfill gas in a device that achieves 98 percent destruction of NMOCs or they treat gas for sale or on-site use. This level of treatment and subsequent combustion not only achieves the environmental benefits of reducing landfill gas emissions, but also utilizes landfill gas as an energy resource.

This technical aspects of this alternative approach are consistent with public comments on previous notices (67 FR 36475, May 23, 2002 and 71 FR 53271, September 8, 2006). It is also consistent with input from the SERs and recent Federalism consultation participants who stated that the extent of filtration, de-watering, and compression can be site dependent, and that different sites require different levels of gas treatment to protect the combustion devices that use treated landfill gas as a fuel and ensure good combustion. The alternative treatment provisions are also consistent with the 2002 proposed definition of treatment system as ''a system that filters, de-waters, and compresses landfill gas.'' The alternative definition of treatment system gas allows the level of treatment to be tailored to the type and design of the specific combustion equipment in which the landfill gas is used. Instead of meeting numerical specifications for treated landfill gas, owners/operators would specify the level of treatment based on the type and design of the specific combustion equipment that uses the treated landfill gas. Owners/operators would identify monitoring parameters and keep records that demonstrate that such parameters effectively monitor filtration, de-watering, or compression system performance necessary for the end use of the treated landfill gas. We are also proposing to define ''treated landfill gas'' to mean landfill gas processed in a treatment system. The intent of the treatment option is to require active lowering of the dew point consistent with the better available treatment systems, as such, we did not intend knock-out pots (for example) to qualify.

Owners/operators would develop a site-specific treatment system monitoring plan that would not only accommodate site-specific and end-use specific treatment requirements for different energy recovery technologies, but would also ensure environmental protection. Most landfill owners and operators that treat landfill gas combust the landfill gas in a combustion device that achieves 98 percent destruction of NMOCs. Thus, the treatment option offers a similar level of environmental protection as combusting the landfill gas. Landfill owners and operators that are beneficially using landfill gas are motivated to efficiently treat landfill gas for the intended purpose in order to protect energy recovery equipment, maintain warranties on equipment, and meet the gas specifications often specified in contractual requirements with third parties purchasing the gas. Thus, preparing the monitoring plan would document procedures to ensure that the landfill gas has been adequately treated for the intended use. Having a properly operated and efficient treatment system should minimize downtime of the entire GCCS (or routing of the landfill gas to a flare due to shutdown of end-use equipment) because the end-use equipment will continue to operate properly and will need less maintenance if the gas is treated appropriately. By minimizing downtime of the entire system, the destruction of NMOC will be maximized.

The plan would be required to include monitoring parameters addressing all three elements of treatment (filtration, de-watering, and compression) to ensure the treatment system is operating properly for the intended end use of the treated landfill gas. The plan would be required to include monitoring methods, frequencies, and operating ranges for each monitored operating parameter based on manufacturer's recommendations or engineering analysis for the intended end use of the treated landfill gas. Documentation of the monitoring methods and ranges, along with justification, must be included in the site-specific monitoring plan. In the plan, the owner/operator would also need to identify who is responsible (by job title) for data collection, explain the processes and methods used to collect the necessary data, and describe the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems.

The monitoring plan may rely on references to existing corporate documents (e.g., standard operating procedures, quality assurance programs or other documents) provided that the elements required by the monitoring plan are easily recognizable.

The owner or operator would be required to revise the monitoring plan to reflect changes in processes, monitoring instrumentation, and quality assurance procedures; or to improve procedures for the maintenance and repair of monitoring systems to reduce the frequency of monitoring equipment downtime.

The plan must be kept on site and must be available for inspection. In addition, upon request by the Administrator, the owner or operator would be required to make all information that is collected in conjunction with the monitoring plan available for review during an audit or inspection.

B. Wellhead Monitoring Requirements

The EPA is requesting public comment on alternative wellhead monitoring requirements in proposed subpart XXX. One alternative monitoring provision could be in the form of an exclusion from the temperature and oxygen/nitrogen monitoring requirements, or a reduction in the frequency of monitoring. For example, the EPA could reduce the frequency of wellhead monitoring for these three parameters (temperature and oxygen/nitrogen) from monthly to a quarterly or semi-annual schedule. Owners or operators would continue to monitor the wellhead for negative pressure.

The EPA is specifically requesting comment on whether this adjustment should apply only to landfills that

beneficially use landfill gas, and if so whether any quantity of the recovered LFG should qualify for alternative wellhead monitoring. Alternatively, the EPA is requesting comment on whether it would be more appropriate to require a certain percentage of the overall recovered LFG to be beneficially used in order to exempt landfills from or reduce the frequency of the wellhead monitoring requirements. The EPA also requests comments on the availability of this flexibility to small entities owning or operating landfills, regardless of beneficial use.

The EPA would provide these alternatives to encourage new landfills to beneficially use landfill gas. Both of these alternative options (exclusion or reduced monitoring frequency) would provide monitoring relief to these landfills. Landfill owners and operators must operate their GCCS in a manner that collects the most landfill gas and minimizes losses of landfill gas through the surface of the landfill. In addition, landfills would still have to prepare and submit to the regulating authority a gas collection design plan, prepared by a professional engineer.

As proposed, subpart XXX requires landfill owners and operators to operate each interior wellhead in the collection system with a landfill gas temperature less than 55 °C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. Instead of having the landfill owner or operator conduct monthly monitoring of temperature and nitrogen/oxygen at the wellheads, the EPA is considering relying on landfill surface emission monitoring requirements in combination with maintenance of negative pressure at wellheads to indicate proper operation of the GCCS and minimization of surface emissions. The potential removal of the temperature and nitrogen/oxygen operational standards and associated wellhead monitoring requirements for these three parameters would be complemented by the surface monitoring provisions discussed in this preamble. As discussed in section VII.F and VIII.F of this preamble, we are reiterating that landfills must monitor *all cover penetrations* and openings within the area of the landfill where waste has been placed and a gas collection system is required.

Given recent technological advancements in data storage and transmission, the EPA is also considering an alternative to automate the wellhead monthly monitoring provisions. Automation could reduce long-term burden on landfill owner/operators as well as delegated authorities by allowing for a more frequent, but less labor-intensive, data collection system consisting of remote wellhead sensors (i.e. thermistors, electronic pressure transducers, oxygen cells) and a centralized data logger.

The use of continuous monitoring would allow more immediate detection and repair. This would eliminate the time between when the exceedance of the parameter occurs and when it is detected. It could also improve enforceability of the rule by allowing inspectors to review information on the data logger in real time during a site visit. Another advantage to automating the monitoring is that it could provide flexibility for incorporating additional parameters into the monitoring program. The EPA is soliciting comment on this alternative, including the types of parameters that are best suited for an automated monitoring alternative, examples of successful automated monitoring programs at MSW landfills and their associated costs, additional considerations for equipment calibration, and input on any averaging times that might be appropriate to determine when one or more monitored parameters have been exceeded.

C. Enhanced Surface Monitoring Requirements

The EPA is requesting public comment on potential alternative approaches to the surface emission monitoring in proposed subpart XXX. Subpart XXX collection and control requirements are intended for landfills to maintain a tight cover that minimizes any emissions of landfill gas through the surface. The surface emissions monitoring procedures in proposed subpart XXX require quarterly surface emissions monitoring to demonstrate that the cover and gas collection system are working properly. The operational requirements in subpart XXX (40 CFR 60.763(d)) specify that the landfill must ''. . . operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover.''

Proposed subpart XXX requires quarterly monitoring and includes provisions for increased monitoring and corrective procedures if readings above 500 ppm are detected. Instrumentation specifications, monitoring frequencies, and monitoring patterns are structured to provide clear and straightforward procedures that are the minimum necessary to assure compliance.

In this document, we are requesting public comment on potential alternatives to the surface monitoring procedures in proposed subpart XXX. Potential alternatives could include provisions such as those in a California regulation (provisions in California Air Resources Board, Final Regulation Order, Methane Emissions from Municipal Solid Waste Landfills (Article 4, Subarticle 6, sections 95460 to 95476, title 17, California Code of Regulations)) and include changing the walking pattern that traverses the landfill, adding an integrated methane concentration measurement, and allowing sampling only when wind is below a certain speed.

For subpart XXX, we are requesting comment on reducing the interval for the walking pattern that traverses the landfill from 30 meters (98 ft.) to 25 ft. We are also requesting comment on the addition of a methane concentration limit of 25 ppm as determined by integrated surface emissions monitoring. This would be in addition to the 500 ppm emission concentration as determined by instantaneous surface emissions monitoring. Integrated surface emissions monitoring provides an average surface emission concentration across a specified area. For integrated surface emissions monitoring, the specified area would be individually identified 50,000 square foot grids. A tighter walking pattern and the addition of an integrated methane concentration would more thoroughly ensure that the collection system is being operated properly, that the landfill cover and cover material are adequate, and that methane emissions from the landfill surface are minimized. As part of these potential changes, the EPA is also considering not allowing surface monitoring when the average wind speed exceeds 5 miles per hour or the instantaneous wind speed exceeds 10 miles per hour because air movement can affect whether the monitor is accurately reading the methane concentration during surface monitoring. We are considering this change because measurements during windy periods are usually not representative of the emissions.

The EPA estimated the costs associated with both the proposed subpart XXX surface monitoring requirements (which are the same as the surface monitoring requirements in subpart WWW) and potential changes to the surface monitoring provisions under

the proposed option 2.4/40 and applied them to the set of new landfills that would be subject to control requirements under the respective option. To determine the costs, the EPA used the following assumptions: Most landfills will hire a contractor to conduct the quarterly monitoring. The landfill will incur labor costs based on the time it takes to walk the traverse (hours per acre), the size of the landfill (acres), and a labor rate (dollars per hour). The landfill will also incur an equipment rental rate (dollars per hour). Equipment rental rates are dollars per day/week/month, depending on the size of the landfill and time to traverse the acreage during each quarterly period. See the docketed memo ''Methodology for Estimating Testing and Monitoring Costs for the MSW Landfill Regulations. 2014,'' which contains the details for determining the costs that a landfill would incur to conduct enhanced surface monitoring.

Using the techniques discussed in section V.A of this preamble, the EPA estimated the number of landfills that are expected to install controls under the baseline, as well as the proposed option 2.5/40. Then, the EPA applied surface monitoring costs to the respective set of landfills because landfills that must install controls must also conduct surface monitoring. Table 5 of this preamble compares the enhanced surface monitoring costs that would be incurred for new landfills under the baseline and proposed option 2.5/40.

TABLE 5—COMPARISON OF BASELINE SURFACE MONITORING VERSUS ENHANCED SURFACE MONITORING IN 2023

Control option	Surface monitoring option	Number of landfills affected	Number of landfills controlling	Total annual cost (2012$)	Incremental cost	Total cost per controlled landfill	Incremental cost per controlled landfill
Baseline (2.5/50) ...	No change (30 meter traverse).	17	8	42,300	N/A	5,300	N/A
	Enhanced (25-foot traverse, integrated sample).	17	8	312,800	270,500	39,100	33,800
Proposed option (2.5/40).	No change (30 meter traverse).	17	11	50,000	7,700	4,500	700
	Enhanced (25-foot traverse, integrated sample).	17	11	362,900	320,600	33,000	29,100

Several factors contribute to the cost of enhanced surface monitoring. Monitoring along a traverse with a 25 ft. interval would increase monitoring time, and thus the labor costs, compared to monitoring along a 30 meter (98 ft.) interval. Monitoring along the tighter traverse pattern would take approximately four times as long, because the distance is approximately four times. For a landfill to conduct the integrated surface emissions monitoring, the EPA assumed the landfill would rent a handheld portable vapor analyzer with a data logger. The data logger is necessary to obtain an integrated reading over a single 50,000 square foot grid. However, the EPA does not expect that requiring an integrated methane concentration would add significant cost because landfills could use the same instrument that they currently use for the instantaneous readings and these instruments can be programmed to provide an integrated value as well as an instantaneous value.

The EPA recognizes that these provisions could reduce surface emissions and that these emissions reductions are difficult to quantify. The EPA also understands that there are potential implementation concerns with these enhanced procedures. Surface monitoring is a labor intensive process and tightening the grid pattern would increase costs. Of the eight landfills expected to install controls under the baseline, it would take these landfills over 29 hours, on average, to complete each quarterly traverse pattern. Tightening the traverse pattern to 25-feet instead of 30-meters would require over 79 hours per quarter, or more than 200 additional hours per year compared to the current 30-meter traverse pattern. At this time, the EPA is not proposing surface monitoring provisions that differ from those outlined in subpart WWW, but we are soliciting comment on techniques and data to estimate the emission reductions associated with enhanced surface monitoring.

The EPA is requesting comment on allowing the use of alternative remote measurement and monitoring techniques for landfills that exceed the surface monitoring concentrations in subpart XXX. The EPA would like information to determine whether or not to allow these alternative techniques to be used to demonstrate that surface emissions are below the methane surface concentrations in the subpart XXX. Alternative remote measurement and monitoring techniques may include radial plume mapping (RPM), optical remote sensing, Fourier Transform Infrared (FTIR) spectroscopy, cavity ringdown spectroscopy (CRDS), tunable diode laser (TDL), tracer correlation, micrometeorological eddy-covariance, static flux chamber, or differential absorption. The EPA is also seeking comment on the frequency of testing and the format of the standard to use these technologies as an alternative to average surface concentration as measured by Method 21. Incorporation of these technologies in subpart XXX would require a change in format of the standard to be consistent with the technology.

D. Alternative Emission Threshold Determination Techniques

The EPA is considering adjusting the emission threshold determinations that dictate when a GCCS must be installed, including variations in the modeling parameters as well as adding site-specific emission threshold determination. These alternatives may provide additional reporting and compliance flexibilities for owners and operators of affected landfills.

1. Modeling Adjustments

As proposed, subpart XXX has three different tiers available to an affected landfill to estimate whether or not the landfill exceeds the NMOC emission threshold of 50 Mg per year. The

simplest Tier 1 calculation method uses default values for the potential methane generation capacity (L_0) and methane generation rate (k) to determine when the landfill exceeds the 50 Mg NMOC per year emission rate cutoff. The default L_0 is 170 m^3 per Mg of waste (equal to 5,458 cubic feet methane per ton of waste) and the k values are 0.05 per year for areas receiving 25 inches or more of rainfall per year and 0.02 per year for areas receiving less than 25 inches of rainfall. The Tier 1 default NMOC concentration is 4,000 ppmv as hexane. If the Tier 1 calculated NMOC exceeds 50 Mg per year, the landfill must install controls or demonstrate, using more complex Tier 2 or 3 procedures, that NMOC emissions are less than 50 Mg per year.

The EPA is soliciting comment on allowing for alternative Tier 1 default values and modeling techniques based on the amount of organics in the waste. For example, the L_0 is a function of the moisture content and organic content of the waste and L_0 decreases as the amount of organic matter decreases. Recent studies have shown that average U.S. landfill L_0 values have decreased 22 percent between 1990 and 2012 (from 102.6 m^3 per Mg of waste to 79.8 m^3 per Mg of waste) due to increased recovery of organic materials.[27] Subpart XXX could allow for landfill-specific L_0 values to be calculated based on the amount of degradable organic carbon (DOC), similar to components of Equation HH–1 in the GHGRP for MSW landfills (40 CFR part 98 subpart HH).

Subpart HH of the GHGRP also provides separate k-values for different types of materials, which could be used as alternate Tier 1 default values in the revised NSPS. Sewage sludge and food waste have the highest k values, followed by garden waste, diapers, paper, textiles, and wood and straw.[11]

The IPCC model employs a modeling method to accommodate separate k and DOC modeling parameters as well as separate calculations for six different categories of organic wastes.[28]

If the EPA incorporates alternative Tier 1 modeling values in subpart XXX, the EPA would also need to allow for an alternative first-order decay model structure to compute a total methane generation rate for the landfill based on the sum of the methane generated from each separate waste stream. This alternative model may incorporate material-specific k and L_0 values, instead of a single pair of k and L_0 values applied to bulk MSW. The EPA requests comment on whether the alternative modeling parameters and model structure in subpart HH, or other default parameters or modeling procedures would be appropriate to use for emission threshold determinations in subpart XXX.

2. Site-Specific Measurements

Under the proposed subpart XXX, there are three different tiers available to an affected landfill to estimate whether or not the landfill exceeds the NMOC emission threshold of 50 Megagrams per year. If an affected landfill fails a Tier 2 test (i.e., the calculated NMOC emissions are greater than 50 Mg/year), then the landfill must conduct Tier 3 testing or install and operate an active GCCS. The EPA received comments while conducting outreach with small entities that recommended a new Tier 4 surface emission monitoring (SEM) demonstration to allow increased flexibility for landfills that exceed modeled NMOC emission rates if they can demonstrate that site-specific methane emissions are low. This SEM demonstration would be conducted using similar procedures in proposed subpart XXX (see proposed 40 CFR 60.765(d)). If the monitoring finds that methane emissions are below a level that the EPA finalizes in the NSPS review, then installation of a GCCS could be delayed.

As an example, the California Air Resources Board (ARB) adopted the Methane Emissions from MSW Landfills regulation in 2009.[29] Under this rule, if a landfill exceeds the waste-in-place and heat input thresholds, the landfill may conduct an SEM demonstration prior to being required to install a GCCS. If the surface methane emissions show any exceedances above 200 ppm the landfill must install a GCCS. This SEM demonstration is similar to the Tier 4 option being considered by the EPA.

The EPA is soliciting comment about this new Tier 4 option or other ideas for more flexible emission threshold determination ''Tiers'' and what implementation procedures for each determination may be appropriate. As the EPA takes this new Tier 4 option under consideration, there are some implementation procedures that would need to be established. The EPA requests comment on all aspects of implementing a new Tier 4 option, including the following specific items: (1) Which areas of the landfill would be subject to SEM requirements because these areas would no longer be limited to areas with GCCS installed for applicability purposes; (2) what number of exceedances over a specified time period that would require GCCS installation (proposed subpart XXX specifies a new well must be installed at three or more exceedances in a quarter); (3) what frequency of SEM demonstration (e.g., quarterly monitoring for landfills accepting waste, annual monitoring for closed landfills) is appropriate; and (4) what exceedance level is appropriate for determining if a GCCS must be installed (200 ppm or some other level).

X. Impacts of Proposed Revisions

The impacts shown in this section are expressed as the incremental difference between facilities affected by baseline and the proposed reduction of the NMOC emission threshold to 40 Mg/yr from the current NSPS level of 50 Mg/yr. There are incremental costs, emissions, and secondary impacts associated with capturing and/or utilizing the additional LFG under this proposal.

As discussed in section V.B of this preamble, for most NSPS, impacts are expressed 5 years after the effective date of the rule. However, for the landfills NSPS, impacts are expressed 10 years after (year 2023) because the landfills regulations require controls at a given landfill only after the increasing NMOC emission rate reaches the level of the regulatory threshold. Additionally, the regulations allow the collection and control devices to be capped or removed at each landfill after certain criteria are met, which includes having the GCCS operate a minimum of 15 years. Controls would not be required over the same time period for all landfills. The impacts are a direct result of control; therefore, the annualized impacts change from year to year. By 2023, over half of the modeled new landfills are expected to have installed controls and thus, the EPA considered the impacts of the proposal relative to the baseline in 2023, as discussed in section V.B and VI of this preamble. The methodology for estimating the impacts of the NSPS is discussed in section VI of this preamble and in the docketed memorandum ''Methodology for Estimating Cost and Emission Impacts of MSW Landfills Regulations. 2014.'' The results of applying this methodology to the population of future landfills potentially subject to this proposal are in the

[27] Stege, Alex. The Effects of Organic Waste Diversion on LFG Generation and Recovery from U.S. Landfills. SWANA's 37th Annual Landfill Gas Symposium. 2014.

[28] Intergovernmental Panel on Climate Change (IPCC), *IPCC Guidelines for National Greenhouse Gas Inventories*. Volume 5 (Waste), Chapter 3 (Solid Waste Disposal). 2006.

[29] California Code of Regulations, title 17, subchapter 10, article 4, subarticle 6, section 95463, Methane Emissions from Municipal Solid Waste Landfills.

docketed memorandum ''Cost and Emission Impacts Resulting from the Landfill NSPS Review. 2014.'' The impacts of subpart XXX are summarized as the impacts to new landfills estimated to be built during the first 5 years of the standards, between 2014 and 2018. Table 3 of this preamble summarizes the emission reductions and costs associated with the control options considered.

A. What are the air quality impacts?

The proposal would achieve an additional 13 percent reduction in NMOC from landfills constructed since 2013, or 79 Mg/yr, when compared to the baseline, as shown in Table 6 of this preamble. The proposal would also achieve substantial reductions in methane emissions. These reductions are achieved by reducing the NMOC threshold from 50 Mg/yr to 40 Mg/yr.

TABLE 6—EMISSION REDUCTIONS IN 2023 FOR NEW LANDFILLS SUBJECT TO ADDITIONAL CONTROLS UNDER PROPOSED OPTION 2.5/40

Parameter	Quantity
Baseline NMOC Emission Reductions (Mg) [a]	610.
Proposed Incremental NMOC Emission Reductions (Mg)	79.
Baseline Methane Emission Reductions (Mg) [a]	94,800.
Proposed Methane Emission Reductions (Mg)	12,300.
Baseline Methane Emission Reductions (Mg CO_2e) [a]	2.4 million.
Proposed Methane Emission Reductions (Mg CO_2e)	307,600.
% Emission Reduction from Proposal	13% below baseline.

[a] These are the reductions that would be achieved from new landfills if subpart XXX retained the same gas collection and control requirements that are in subpart WWW.

B. What are the water quality and solid waste impacts?

Leachate is the liquid that passes through the landfilled waste and strips contaminants from the waste as the leachate percolates. Precipitation generates the vast majority of leachate volume. Installation of a gas collection system will generate additional liquid, in the form of gas condensate, and it will be routed to the same leachate treatment mechanisms in place for precipitation-based leachate. Collected leachate can be treated on site or transported off site to wastewater treatment facilities. Some landfills have received permits allowing for recirculation of leachate in the landfill, which may further reduce the volume of leachate requiring treatment. Additional liquid generated from gas condensate is not expected to be significant and insufficient data are available to estimate the increases in leachate resulting from expanded gas collection and control requirements.

The additional gas collection and control components required by this proposal have finite lifetimes (approximately 15 years) and these pipes and wells will be disposed of at the end of their useful life. There are insufficient data to quantify the solid waste resulting from disposal of this control infrastructure.

Further, the incremental costs of control for the proposal are not expected to have an appreciable market effect on the waste disposal costs, tipping fees, or the amount of solid waste disposed in landfills because the costs for gas collection represent a small portion of the overall costs to design, construct, and operate a landfill. There is insufficient information to quantify the effect increased gas control costs might have on the amount of solid waste disposed of in landfills versus other disposal mechanisms as recycling, waste-to-energy, or composting.

C. What are the secondary air impacts?

Secondary air impacts may include grid emissions from purchasing electricity to operate the GCCS components, by-product emissions from combustion of landfill gas in flares or energy recovery devices, and offsets to conventional grid emissions from new landfill gas energy supply.

The secondary air impacts are presented as net impacts, considering both the energy demand and energy supply resulting from the proposal. The methodology used to prepare the estimated secondary impacts for this preamble is discussed in the docketed memorandum ''Estimating Secondary Impacts of the Landfills NSPS Review. 2014.''

Because NO_X and SO_2 are covered by capped emissions trading programs, and methodological limitations prevent us from quantifying the change in CO and PM, we do not estimate an increase in secondary air impacts for this rule from additional demand for grid purchased electricity to operate control systems. The net impacts were computed for mercury and CO_2e. After considering the offsets from LFG electricity, the impacts of the proposal are expected to reduce overall mercury emissions by 577 tons per year (tpy) and reduce CO_2 emissions by 26,139 tpy. These CO_2 emission reductions are in addition to the CO_2e emission reductions achieved from the direct destruction of methane in flares or engines presented in Table 6 of this preamble.

D. What are the energy impacts?

The proposal is expected to have a very minimal impact on energy supply and consumption. Active gas collection systems require energy to operate the blowers and pumps and the proposal will increase the volume of landfill gas collected. When the least cost control is a flare, energy may be purchased from the grid to operate the blowers of the landfill gas collection system. However, when the least cost control option is an engine, the engine may provide this energy to the gas control system and then sell the excess to the grid. Considering the balance of energy generated and demanded from the estimated least cost controls, the proposal is estimated to have a net impact of 42,400 megawatt hours (MWh) of additional energy supply per year.

E. What are the cost impacts?

To meet the proposed emission limits, a landfill is expected to install the least cost control for combusting the landfill gas. The cost estimates (described in sections V and VI of this preamble) evaluated each landfill to determine whether a gas collection and flare or a gas collection with flare and engine equipment would be least cost, after considering local power buyback rates and whether the quantity of landfill gas was sufficient to generate electricity. The control costs include the costs to install and operate gas collection infrastructure such as wells, header pipes, blowers, and an enclosed flare. For landfills where the least cost control option was an engine, the costs also

include the cost to install and operate one or more reciprocating internal combustion engines to convert the landfill gas into electricity. Revenue from electricity sales was incorporated into the net control costs using state-specific data on wholesale purchase prices, where engines were deemed to be the least cost control option. Testing and monitoring costs at controlled landfills include the cost to conduct initial performance tests on the enclosed flare or engine control equipment, quarterly surface monitoring, continuous combustion monitoring, and monthly wellhead monitoring. At uncontrolled landfills, the testing and monitoring costs include calculation and reporting of NMOC emission rates using either Tier 1 or Tier 2 testing.

The nationwide incremental annualized net cost for the proposal is $471,000, of which $5,900 is testing and monitoring costs. Table 7 of this preamble presents the costs.

TABLE 7—INCREMENTAL COST IMPACTS IN 2023 FOR NEW LANDFILLS SUBJECT TO ADDITIONAL CONTROLS UNDER THE PROPOSAL

Option	Total number of landfills incurring cost [a]	Annualized control cost	Average annualized revenue	Average annualized testing and monitoring cost	Average net total annualized cost
Total Costs of Baseline ($2012)					
Baseline 2.5/50	13	23,956,900	21,315,300	66,400	2,708,000
Incremental Costs Above Baseline ($2012)					
Proposed 2.5/40	17	3,178,800	2,713,700	5,900	471,000

[a] Under proposal, a total of 11 landfills are expected to install controls by 2023, compared with eight landfills under the baseline. A total of 17 landfills meet the design capacity criteria of 2.5 million Mg and must report their NMOC emission rates under the proposal. This is the same number of landfills expected to report under the baseline.

F. What are the economic impacts?

Because of the relatively low cost of the proposal and the lack of appropriate economic parameters or model, the EPA is unable to estimate the impacts of the options on the supply and demand for MSW landfill services. However, because of the relatively low incremental costs of the proposal, the EPA does not believe the proposal would lead to changes in supply and demand for landfill services or waste disposal costs, tipping fees, or the amount of waste disposed in landfills. Hence, the overall economic impact of the proposal should be minimal on the affected industries and their consumers.

G. What are the benefits?

The proposal is expected to achieve additional emission reductions from MSW landfills from landfills constructed, modified or reconstructed on or after July 17, 2014. By lowering the NMOC emissions threshold to 40 Mg/yr, the proposal would achieve additional reductions of 79 Mg NMOC/year, 12,300 Mg/yr methane (307,000 Mg/yr CO_2e) in 2023. These pollutants are associated with substantial health, welfare, and climate effects.

This rulemaking is not an ''economically significant regulatory action'' under Executive Order 12866 because it is not likely to have an annual effect on the economy of $100 million or more. Therefore, we have not conducted a Regulatory Impact Analysis (RIA) or a benefits analysis for this rulemaking. Although we expect that these avoided emissions will result in improvements in air quality and reduce health effects associated with exposure to air pollution related emissions, we have not quantified or monetized the benefits of reducing these emissions for this rulemaking. This does not imply that there are no benefits associated with these emission reductions. We provide a qualitative description of benefits associated with reducing these pollutants below. When determining if the benefits of an action exceed its costs, Executive Orders 12866 and 13563 direct the agency to consider qualitative benefits that are difficult to quantity but nevertheless essential to consider.

H. What are the health and welfare effects of LFG emissions?

1. Health Impacts of VOC and Various Organic HAP

The pollutant regulated under the landfills NSPS is ''MSW landfill emissions.'' Municipal solid waste landfill emissions, also commonly referred to as LFG, are a collection of air pollutants, including methane and NMOC, some of which are toxic. LFG generated from established waste (waste that has been in place for at least a year) is typically composed of roughly 50-percent methane and 50-percent CO_2 by volume, with less than 1 percent NMOC. The NMOC portion of landfill gas can contain a variety of air pollutants, including various organic HAPs and volatile organic compounds (VOCs). Nearly 30 organic HAPs have been identified in uncontrolled landfill gas, including benzene, toluene, ethyl benzene, and vinyl chloride.[30]

VOC emissions are precursors to both fine particulate matter ($PM_{2.5}$) and ozone formation. Exposure to $PM_{2.5}$ and ozone is associated with significant public health effects.[31] [32] $PM_{2.5}$ is associated with health effects, including premature mortality for adults and infants, cardiovascular morbidity such as heart attacks, and respiratory morbidity such as asthma attacks, acute and chronic bronchitis, hospital admissions and emergency room visits, work loss days, restricted activity days and respiratory symptoms, as well as visibility impairment.[33] Ozone is associated with

[30] U.S. EPA. 1998. Office of Air and Radiation, Office of Air Quality Planning and Standards. ''Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I: Stationary Point and Area Sources, Chapter 2: Solid Waste Disposal, Section 2.4: Municipal Solid Waste Landfills''. Available at: *http://www.epa.gov/ttn/chief/ap42/ch02/final/c02s04.pdf.*

[31] U.S. EPA. 2009. ''Integrated Science Assessment for Particulate Matter (Final Report).'' EPA–600–R–08–139F. National Center for Environmental Assessment—RTP Division. Available at *http://www.epa.gov/ncea/isa/.*

[32] U.S. EPA. 2013. ''Integrated Science Assessment for Ozone and Related Photochemical Oxidents (Final Report).'' EPA–600–R–10–076F. National Center for Environmental Assessment—RTP Division. Available at *http://www.epa.gov/ncea/isa/.*

[33] U.S. EPA. 2009. ''Integrated Science Assessment for Particulate Matter (Final Report).'' EPA–600–R–08–139F. National Center for Environmental Assessment—RTP Division. Available at *http://www.epa.gov/ncea/isa/.*

health effects including premature mortality, lung damage, asthma aggravation and other respiratory symptoms, hospital and emergency department visits, and school loss days, as well as injury to vegetation and climate effects.[34]

2. Climate Impacts of Methane Emissions

In addition to the improvements in air quality and resulting benefits to human health and non-climate welfare effects previously discussed, this rule is expected to result in climate co-benefits due to anticipated methane reductions. In 2012, landfills were the third-largest anthropogenic source of methane emissions in the United States, accounting for approximately 18 percent of domestic methane emissions.[35] Methane is a potent GHG with a global warming potential that is 25 times greater than CO_2, which accounts for methane's stronger absorption of infrared radiation per ton in the atmosphere but also its shorter lifetime (on the order of a decade compared to centuries or millennia for carbon dioxide).[36] According to the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report, methane is the second leading long-lived climate forcer after CO_2 globally.[37]

As discussed in detail in the 2009 Endangerment Finding, climate change caused by human emissions of GHGs threatens public health in multiple ways. By raising average temperatures, climate change increases the likelihood of heat waves, which are associated with increased deaths and illnesses. While climate change also increases the likelihood of reductions in cold-related mortality, evidence indicates that the increases in heat mortality will be larger than the decreases in cold mortality in the United States. Compared to a future without climate change, climate change is expected to increase ozone pollution over broad areas of the United States, including in the largest metropolitan areas with the worst ozone problems, and thereby increase the risk of morbidity and mortality. Other public health threats also stem from projected increases in intensity or frequency of extreme weather associated with climate change, such as increased hurricane intensity, increased frequency of intense storms, and heavy precipitation. Increased coastal storms and storm surges due to rising sea levels are expected to cause increased drownings and other health impacts. Children, the elderly, and the poor are among the most vulnerable to these climate-related health effects.

As documented in the 2009 Endangerment Finding, climate change caused by human emissions of GHGs also threatens public welfare in multiple ways. Climate changes are expected to place large areas of the country at serious risk of reduced water supplies, increased water pollution, and increased occurrence of extreme events such as floods and droughts. Coastal areas are expected to face increased risks from storm and flooding damage to property, as well as adverse impacts from rising sea level, such as land loss due to inundation, erosion, wetland submergence and habitat loss. Climate change is expected to result in an increase in peak electricity demand, and extreme weather from climate change threatens energy, transportation, and water resource infrastructure. Climate change may exacerbate ongoing environmental pressures in certain settlements, particularly in Alaskan indigenous communities. Climate change also is very likely to fundamentally rearrange U.S. ecosystems over the 21st century. Though some benefits may balance adverse effects on agriculture and forestry in the next few decades, the body of evidence points towards increasing risks of net adverse impacts on U.S. food production, agriculture and forest productivity as temperature continues to rise. These impacts are global and may exacerbate problems outside the United States that raise humanitarian, trade, and national security issues for the United States.

While the EPA recognizes the potential methane reductions resulting from the range of changes to the current control framework outlined in this proposal would provide for economic climate co-benefits, the EPA has not presented monetized estimates of these potential co-benefits because the U.S. Government (USG) has not released directly modeled estimates of the social cost of methane ($SC–CH_4$), a metric that estimates the monetary value of impacts associated with marginal changes in methane emissions in a given year.

In recent rulemakings expected to have impacts on methane emissions, the EPA has considered the benefits of methane emission reductions in sensitivity analyses using an approach to approximate the value of marginal non-CO_2 GHG emission reductions. In these sensitivity analyses, the global warming potential is used to convert the reductions in methane emissions to CO_2-equivalents, which are then valued using the USG $SC–CO_2$ estimates. The EPA has not presented these estimates in a main benefit-cost analysis due to the well-documented limitations associated with using GWP and the $SC-CO_2$ to value changes in non-CO_2 GHG emissions.

Methane is also a precursor to ground-level ozone, a health-harmful air pollutant. Additionally, ozone is a short-lived climate forcer that contributes to global warming. In remote areas, methane is a dominant precursor to tropospheric ozone formation.[38] Approximately 50 percent of the global annual mean ozone increase since preindustrial times is believed to be due to anthropogenic methane.[39] Projections of future emissions also indicate that methane is likely to be a key contributor to ozone concentrations in the future.[40] Unlike NO_X and VOC, which affect ozone concentrations regionally and at hourly time scales, methane emissions

[34] U.S. EPA. 2013. ''Integrated Science Assessment for Ozone and Related Photochemical Oxidents (Final Report).'' EPA–600–R–10–076F. National Center for Environmental Assessment—RTP Division. Available at *http://www.epa.gov/ncea/isa/*.

[35] U.S. EPA. 2012. ''Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2012. Executive Summary.'' Available at *http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2014-Chapter-Executive-Summary.pdf.*

[36] 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.

[37] Stocker, T.F., D. Qin, G.-K. Plattner, L.V. Alexander, S.K. Allen, N.L. Bindoff, F.-M. Bréon, J.A. Church, U. Cubasch, S. Emori, P. Forster, P. Friedlingstein, N. Gillett, J.M. Gregory, D.L. Hartmann, E. Jansen, B. Kirtman, R. Knutti, K. Krishna Kumar, P. Lemke, J. Marotzke, V. Masson-Delmotte, G.A. Meehl, I.I. Mokhov, S. Piao, V. Ramaswamy, D.Randall, M. Rhein, M. Rojas, C. Sabine, D. Shindell, L.D. Talley, D.G. Vaughan and S.-P. Xie. 2013: ''Technical Summary. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change'' [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[38] U.S. EPA. 2013. ''Integrated Science Assessment for Ozone and Related Photochemical Oxidents (Final Report).'' EPA–600–R–10–076F. National Center for Environmental Assessment—RTP Division. Available at *http://www.epa.gov/ncea/isa/*.

[39] Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestvedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: Anthropogenic and Natural Radiative Forc–ing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Pg. 680.

[40] *Ibid.*

affect ozone concentrations globally and on decadal time scales given methane's relatively long atmospheric lifetime compared to these other ozone precursors.[41] Reducing methane emissions, therefore, may contribute to efforts to reduce global background ozone concentrations that contribute to the incidence of ozone-related health effects.[42] [43] These benefits are global and occur in both urban and rural areas.

XI. Statutory and Executive Order Reviews

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

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a ''significant regulatory action'' because it raises novel legal or policy issues. Accordingly, the EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action (EPA–HQ–OAR–2003–0215).

B. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) document prepared by EPA has been assigned EPA ICR number 2498.01.

The information required to be collected is necessary to identify the regulated entities subject to the proposed rule and to ensure their compliance with the proposed rule. The recordkeeping and reporting requirements are mandatory and are being established under authority of CAA section 114 (42 U.S.C. 7414). All information other than emissions data submitted as part of a report to the agency for which a claim of confidentiality is made will be safeguarded according to CAA section 114(c) and the EPA's implementing regulations at 40 CFR part 2, subpart B.

The proposed rule requires very similar information collection requirements as the ICR currently approved for existing landfills under subpart WWW (ICR number 1557.08). However, this ICR will affect new landfills that are constructed, modified or reconstructed on or after July 17, 2014 that have a design capacity of 2.5 million Mg or 2.5 million cubic meters.

The proposed rule will require affected landfills to submit a one-time initial design capacity report, and a periodic amended design capacity report if the design capacity is increased above the threshold. The proposed rule will also require an annual or every 5 year submittal of an NMOC emission rate report, depending on whether the landfill conducts Tier 1 or Tier 2 testing, respectively. Prior to installing GCCS, the proposed rule requires the landfill owner or operator to submit a design plan for approval by the delegated authority. The proposed rule also requires a one-time closure report after the landfill ceases to accept waste and another one-time report just prior to the removal or cessation of gas collection and control equipment. The proposed rule requires annual reports to be submitted to document any exceedances or periods when the GCCS was not operating as well an initial performance test of the control system. The proposed rule also requires records to be maintained for at least 5 years. The types of records depend on whether or not the landfill has installed gas collection and control equipment and are detailed in the supporting statement for ICR number 2498.01.

The EPA estimates that no new landfills will install controls during the first 3 years after the effective date of subpart XXX. Therefore, the burden estimates shown in this section represent the burden associated with many of the one-time recordkeeping and reporting requirements as well as the reports that are required from landfills with design capacities under the proposed threshold of 2.5 million Mg and 2.5 million cubic meters.

The annual monitoring, reporting, and recordkeeping burden for this collection (averaged over the first 3 years after the effective date of the standards) for the proposal is estimated to be 51 hours per response. An estimated eight responses per year will be submitted each year and there will be approximately 12 annual respondents per year. This burden is estimated to cost $39,300 per year. This includes an annual labor cost of $33,200 and a purchased services cost of $6,100. Burden is defined at 5 CFR 1320.3(b).

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9.

To comment on the agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, the EPA has established a public docket for this rule, which includes this ICR, under Docket ID number EPA–HQ–OAR–2003–0215. Submit any comments related to the ICR to the EPA and OMB. See **ADDRESSES** section at the beginning of this document for where to submit comments to the EPA. Send comments to OMB at the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street NW., Washington, DC 20503, Attention: Desk Office for EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after July 17, 2014, a comment to OMB is best assured of having its full effect if OMB receives it by August 18, 2014. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

C. Regulatory Flexibility Act

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 the proposed rule on small entities, small entity is defined as: (1) A small business that is primarily engaged in the collection and disposal of refuse in a landfill operation as defined by NAICS codes 562212 with annual receipts less than $35.5 million; (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 that is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's proposed 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 subject to the requirements of this proposed rule may include private small businesses and small governmental jurisdictions that

[41] *Ibid.*

[42] West, J.J., Fiore, A.M. 2005. ''Management of tropospheric ozone by reducing methane emissions.'' Environ. Sci. Technol. 39:4685–4691.

[43] Anenberg, S.C., et al. 2009. ''Intercontinental impacts of ozone pollution on human mortality,'' Environ. Sci. & Technol. 43: 6482–6487.

own or operate landfills. Although it is unknown how many new landfills will be owned or operated by small entities, recent trends in the waste industry have been towards consolidated ownership among larger companies. The EPA has determined that approximately 10 percent of the existing landfills subject to similar regulations (40 CFR Part 60 subparts WWW and Cc or the corresponding state or federal plan) are small entities.

Because the ownership of new landfills in the future is unknown, the EPA performed a screening analysis that assumed new landfills would be physically and financially similar to and have the same type of ownership as recently established landfills. Based upon historical data, the screening analysis predicted that four new landfills would be owned by small entities, but that none would be owned by small governments.

One of the four small landfills is predicted to be incrementally affected by proposal. The screening analysis compared estimated annualized compliance costs for the proposal to company sales based on historical data. The maximum ratio of compliance cost to company revenue was 12 percent for this modeled small entity. To determine whether the impacts estimated for 2023 are representative of longer-term impacts to small landfills, the EPA further investigated 30 years of cost information (2014–2043) for the four small model landfills. Over the 30-year time frame, two small landfills are never incrementally affected by the proposal. One landfill has impacts of up to 12 percent (as described above), but impacts of this magnitude only occur in two years of the 30 years. In general, average impacts over the 30-year timeframe are approximately 1 percent or less and maximum impacts are less than 3 percent. In some years, incremental impacts are negative, indicating that the proposed provisions are less costly than the baseline NSPS. These impacts are shown in more detail in the Economic Impact Analysis.

Based upon this analysis, we conclude there will not be SISNOSE arising from this proposal. First, these proposed revisions do not impact a substantial number of small entities. Only two small entities are potentially impacted, which does not constitute a substantial number. Additionally, the impacts to these small entities are not significant. Only one of the two landfills has impacts greater than 3 percent of sales in two of the 30 years examined. The costs incurred by small entities are the result of having to install controls earlier than would have been the case under the existing NSPS. (These costs would have been incurred in later years under the existing NSPS.) There will continue be a lag between the opening of the landfill and the implementation of controls during which the site will be generating revenue through tipping fees. This analysis only considers control costs and revenues associated with the collection of landfill gas and does not estimate the future collection of tipping fees which will be set at a level to adequately plan for known, future requirements.

Given the trend toward larger landfills, it is possible that there will be fewer small landfills in the future than in data from the past 5 years. Additionally, while we assume that the new landfills will be financially and operationally similar to recently opened landfills, numerous factors could influence the actual size, location, and revenue of landfills that open in the future. The model landfills are based on landfills currently in operation that will not be subject to the proposed revisions. All small landfills that will be subject to these proposed revisions will make decisions about their development and operations with full knowledge of the requirements proposed.

Although not required by the RFA to convene a Small Business Advocacy Review (SBAR) Panel because the EPA has now determined that this proposal would not have a significant economic impact on a substantial number of small entities, the EPA had originally convened a panel to obtain advice and recommendations from small entity representatives potentially subject to this rule's requirements. The panel was not formally concluded; however, a summary of the outreach conducted and the written comments submitted by the small entity representatives that the SBAR Panel consulted can be found in the docket for this rulemaking. Although this proposed 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 this rule on small entities. For more information, please refer to the economic impact and small business analysis that is in the docket. We continue to be interested in the potential impacts of the proposed rule on small entities and welcome comments on issues related to such impacts.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531–1538, requires federal agencies, unless otherwise prohibited by law, to assess the effects of their regulatory actions on state, local, and tribal governments and the private sector. Federal agencies must also develop a plan to provide notice to small governments that might be significantly or uniquely affected by any regulatory requirements. The plan must enable officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant federal intergovernmental mandates and must inform, educate, and advise small governments on compliance with the regulatory requirements.

This action does 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. This action applies to landfills that were constructed, modified or reconstructed on or after July 17, 2014. Impacts resulting from the proposed subpart XXX are far below the applicable threshold. Thus, this action is not subject to the requirements of sections 202 or 205 of the UMRA.

In developing this rule, the EPA consulted with small governments pursuant to a plan established under section 203 of the UMRA to address impacts of regulatory requirements in the rule that might significantly or uniquely affect small governments. The EPA held meetings as discussed in section XI.E of this preamble under Federalism consultations.

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 proposed rule will not have impacts of $25 million or more in any one year. Thus, Executive Order 13132 does not apply to this action. Although section 6 of Executive Order 13132 does not apply to this action, the EPA did consult with state and local officials and representatives of state and local governments in developing this action. The EPA conducted a Federalism Consultation Outreach Meeting on September 10, 2013. Due to interest in that meeting, additional outreach meetings were held on November 7, 2013 and November 14, 2013. Participants included the National Governors' Association, the National Conference of State Legislatures, the Council of State Governments, the National League of Cities, the U.S.

Conference of Mayors, the National Association of Counties, the International City/County Management Association, the National Association of Towns and Townships, the County Executives of America, the Environmental Council of States, National Association of Clean Air Agencies, Association of State and Territorial Solid Waste Management Officials, environmental agency representatives from 43 states, and approximately 60 representatives from city and county governments. The comment period was extended to allow sufficient time for interested parties to review briefing materials and provide comments. Concerns raised during that consultation include: Implementation concerns associated with shortening of gas collection system installation and/or expansion timeframes, the need for clarity in regards to the definition of landfill gas treatment, concerns regarding significant lowering of the design capacity or emission thresholds, the need for clarifications associated with wellhead operating parameters and the need for consistent, clear and rigorous surface monitoring requirements. The EPA provided responses to these concerns in sections V, VII, and VIII of this preamble.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between the EPA and state and local governments, the EPA specifically solicits comment on this proposed action from state and local officials.

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). Based on methodology used to predict future landfills as outlined in the docketed memorandum ''Summary of Landfill Dataset Used in the Cost and Emission Reduction Analysis of Landfills Regulations. 2014,'' future tribal landfills are not anticipated to be large enough to become subject to the rulemaking. Thus, Executive Order 13175 does not apply to this action. The EPA specifically solicits comment on this action from tribal officials.

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

The EPA interprets EO 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 EO 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 a ''significant energy action'' as defined in Executive Order 13211 (66 FR 28355, May 22, 2001), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Further, we have concluded that this rule is not likely to have any adverse energy effects because there are a small number of new landfills expected to be subject control requirements under subpart XXX in 2023. Further, the energy demanded to operate these control systems will be offset by additional energy supply from landfill gas energy projects.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law No. 104–113 (15 U.S.C. 272 note) directs the EPA to use voluntary consensus standards (VCS) in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. VCS are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs the EPA to provide Congress, through OMB, explanations when the agency decides not to use available and applicable VCS.

The EPA conducted searches for VCS for the Landfills NSPS through the enhanced National Service Standards Network Database managed by the American National Standards Institute (ANSI). The EPA also contacted VCS organizations and accessed and searched their databases. Searches were conducted for EPA Methods 2E, 3, 3A, 3C, 21, 25, and 25C of 40 CFR part 60, appendix A. No applicable voluntary standards were identified for Methods 2E, 21, and 25C.

The search identified nine VCS that were potentially applicable for this rule in lieu of EPA reference methods. After reviewing the available standards, the EPA determined that the nine candidate VCS (ANSI/ASME PTC 19–10–1981 Part 10, ASTM D3154–00 (2006), ASME B133.9–1994 (2001), ISO 10396:1993 (2007), ISO 12039:2001, ASTM D5835–95 (2007), ASTM D6522–00 (2005), CAN/CSA Z223.2–M86 (1999), ISO 14965:2000(E)) identified for measuring emissions of pollutants or their surrogates subject to emission standards in the rule would not be practical due to lack of equivalency, documentation, validation data, and other important technical and policy considerations. The EPA's review, including review comments for these nine methods, is documented in the memorandum, ''Voluntary Consensus Standard Results for Standards of Performance for Municipal Solid Waste Landfills 40 CFR Part 60, Subpart XXX'' in the docket for this rulemaking (EPA–HQ–OAR–2003–0215).

The EPA welcomes comments on this aspect of the proposed rulemaking and, specifically, invites the public to identify potentially-applicable voluntary consensus standards and to explain why such standards should be used in this regulation.

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.

To gain a better understanding of the landfill source category and near-source populations, the EPA conducted a proximity analysis at a study area of 3 miles of the source category for this rulemaking. This analysis identifies, on a limited basis, the subpopulations that may be exposed to air pollution from the regulated sources and thus are expected to benefit most from this regulation. This analysis does not identify the demographic characteristics of the most highly affected individuals or communities, nor does it quantify the level of risk faced by those individuals or communities. To the extent that any minority, low-income or indigenous subpopulation is disproportionately impacted by hazardous air emissions due to the proximity of their homes to sources of these emissions, that subpopulation also stands to see increased environmental and health benefit from the emission reductions called for by this rule.

In regards to the landfills NSPS, the EPA has concluded that it is not

practicable to determine whether there would be disproportionately high and adverse human health or environmental effects on minority, low income, or indigenous populations from this proposed rule because it is unknown where new facilities will be located. The demographic analysis results and the details concerning their development are presented in the March 25, 2014 document entitled, ''2014 Environmental Justice Screening Report for Municipal Solid Waste Landfills,'' a copy of which is available in the docket for this rulemaking (Docket ID No. EPA–HQ–OAR–2003–0215).

List of Subjects 40 CFR Part 60

Environmental protection, Administrative practice and procedure, Air pollution control, Reporting and recordkeeping requirements.

Dated: June 30, 2014.

Gina McCarthy,

Administrator.

For the reasons stated in the preamble, the Environmental Protection Agency proposes to amend title 40, chapter I of the Code of Federal Regulations as follows:

PART 60—[AMENDED]

■ 1. The authority citation for part 60 continues to read as follows:

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

■ 2. Add subpart XXX to read as follows:

Subpart XXX—Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification on or After July 17, 2014.

Sec.

Subpart XXX—Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification on or After July 17, 2014.

§ 60.760 Applicability, designation of affected source, and delegation of authority.

(a) The provisions of this subpart apply to each municipal solid waste landfill that commenced construction, reconstruction or modification on or after July 17, 2014. Physical or operational changes made to a MSW landfill solely to comply with subpart Cc or WWW of this part are not considered construction, reconstruction, or modification for the purposes of this section.

(b) The following authorities shall be retained by the Administrator and not transferred to the state: § 60.764(a)(5).

(c) Activities required by or conducted pursuant to a CERCLA, RCRA, or state remedial action are not considered construction, reconstruction, or modification for purposes of this subpart.

§ 60.761 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act or in subpart A of this part.

Active collection system means a gas collection system that uses gas mover equipment.

Active landfill means a landfill in which solid waste is being placed or a landfill that is planned to accept waste in the future.

Closed landfill means a landfill in which solid waste is no longer being placed, and in which no additional solid wastes will be placed without first filing a notification of modification as prescribed under § 60.7(a)(4). Once a notification of modification has been filed, and additional solid waste is placed in the landfill, the landfill is no longer closed.

Closure means that point in time when a landfill becomes a closed landfill.

Commercial solid waste means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

Controlled landfill means any landfill at which collection and control systems are required under this subpart as a result of the nonmethane organic compounds emission rate. The landfill is considered controlled at the time a collection and control system design plan is submitted in compliance with § 60.762(b)(2)(i).

Design capacity means the maximum amount of solid waste a landfill can accept, as indicated 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 the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation must include a site specific density, which must be recalculated annually.

Disposal facility means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

Emission rate cutoff means the threshold annual emission rate to which a landfill compares its estimated emission rate to determine if control under the regulation is required.

Enclosed combustor means an enclosed firebox which maintains a relatively constant limited peak temperature generally using a limited supply of combustion air. An enclosed flare is considered an enclosed combustor.

Flare means an open combustor without enclosure or shroud.

Gas mover equipment means the equipment (i.e., fan, blower, compressor) used to transport landfill gas through the header system.

Household waste means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including, but not limited to, single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas). Household waste does not include fully segregated yard waste.

Industrial solid waste means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under Subtitle C of the Resource Conservation and Recovery Act, parts 264 and 265 of this title. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: Electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.

Interior well means any well or similar collection component located inside the perimeter of the landfill waste. A perimeter well located outside

the landfilled waste is not an interior well.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile as those terms are defined under § 257.2 of this title.

Lateral expansion means a horizontal expansion of the waste boundaries of an existing MSW landfill. A lateral expansion is not a modification unless it results in an increase in the design capacity of the landfill.

Modification means an increase in the permitted mass or volume design capacity of the landfill by either horizontal or vertical expansion based on its permitted design capacity as of July 17, 2014. Modification does not occur until the owner or operator commences construction on the horizontal or vertical expansion.

Municipal solid waste landfill or *MSW landfill* means an entire disposal facility in a contiguous geographical space where household waste is placed in or on land. An MSW landfill may also receive other types of RCRA Subtitle D wastes (§ 257.2 of this title) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of an MSW landfill may be separated by access roads. An MSW landfill may be publicly or privately owned. An MSW landfill may be a new MSW landfill, an existing MSW landfill, or a lateral expansion.

Municipal solid waste landfill emissions or *MSW landfill emissions* means gas generated by the decomposition of organic waste deposited in an MSW landfill or derived from the evolution of organic compounds in the waste.

NMOC means nonmethane organic compounds, as measured according to the provisions of § 60.764.

Nondegradable waste means any waste that does not decompose through chemical breakdown or microbiological activity. Examples are, but are not limited to, concrete, municipal waste combustor ash, and metals.

Passive collection system means a gas collection system that solely uses positive pressure within the landfill to move the gas rather than using gas mover equipment.

Segregated yard waste means vegetative matter resulting exclusively from the cutting of grass, the pruning and/or removal of bushes, shrubs, and trees, the weeding of gardens, and other landscaping maintenance activities.

Sludge means any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant.

Solid waste means any garbage, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permits under 33 U.S.C. 1342, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (42 U.S.C 2011 et seq.).

Sufficient density means any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors, and surface collectors, necessary to maintain emission and migration control as determined by measures of performance set forth in this part.

Sufficient extraction rate means a rate sufficient to maintain a negative pressure at all wellheads in the collection system without causing air infiltration, including any wellheads connected to the system as a result of expansion or excess surface emissions, for the life of the blower.

Treated landfill gas means landfill gas processed in a treatment system as defined in this subpart.

Treatment system means a system that has an absolute filtration rating of 10 microns or less, lowers the water dew point of the landfill gas to 45 degrees Fahrenheit or lower with a de-watering process, and compresses the landfill gas.

Untreated landfill gas means any landfill gas that is not treated landfill gas.

§ 60.762 Standards for air emissions from municipal solid waste landfills.

(a) Each owner or operator of an MSW landfill having a design capacity less than 2.5 million megagrams by mass or 2.5 million cubic meters by volume shall submit an initial design capacity report to the Administrator as provided in § 60.767(a). The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions shall be documented and submitted with the report. Submittal of the initial design capacity report shall fulfill the requirements of this subpart except as provided for in paragraphs (a)(1) and (a)(2) of this section.

(1) The owner or operator shall submit to the Administrator an amended design capacity report, as provided for in § 60.767(a)(3).

(2) When an increase in the maximum design capacity of a landfill exempted from the provisions of § 60.762(b) through § 60.769 of this subpart on the basis of the design capacity exemption in paragraph (a) of this section results in a revised maximum design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the owner or operator shall comply with the provision of paragraph (b) of this section.

(b) Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, shall either comply with paragraph (b)(2) of this section or calculate an NMOC emission rate for the landfill using the procedures specified in § 60.764. The NMOC emission rate shall be recalculated annually, except as provided in § 60.767(b)(1)(ii) of this subpart. The owner or operator of an MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters is subject to part 70 or 71 permitting requirements.

(1) If the calculated NMOC emission rate is less than 40 megagrams per year, the owner or operator shall:

(i) Submit an annual emission report to the Administrator, except as provided for in § 60.767(b)(1)(ii); and

(ii) Recalculate the NMOC emission rate annually using the procedures specified in § 60.764(a)(1) until such time as the calculated NMOC emission rate is equal to or greater than 40 megagrams per year, or the landfill is closed.

(A) If the NMOC emission rate, upon recalculation required in paragraph (b)(1)(ii) of this section, is equal to or greater than 40 megagrams per year, the owner or operator shall install and start up a collection and control system in compliance with paragraph (b)(2) of this section.

(B) If the landfill is permanently closed, a closure notification shall be submitted to the Administrator as provided for in § 60.767(d).

(2) If the calculated NMOC emission rate is equal to or greater than 40 megagrams per year, the owner or operator shall:

(i) Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year:

(A) The collection and control system as described in the plan shall meet the design requirements of paragraph (b)(2)(ii) of this section.

(B) The collection and control system design plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of §§ 60.763 through 60.768 proposed by the owner or operator.

(C) The collection and control system design plan shall either conform with specifications for active collection systems in § 60.769 or include a demonstration to the Administrator's satisfaction of the sufficiency of the alternative provisions to § 60.769.

(D) If the owner or operator chooses to demonstrate compliance with the emission control requirements of this subpart using a treatment system as defined in this subpart and according to the requirements of paragraph (b)(2)(iii)(C) of this section, then the collection and control system design plan must include:

(*1*) Design specifications for the filtration, de-watering, and compression systems that demonstrate conformance with the treatment system definition contained in § 60.761.

(*2*) The minimum pressure drop across the filtration system, or other monitoring parameter(s) and operating ranges that indicate proper performance of the filtration system. The collection and control plan must include information, such as manufacturer's recommendations or engineering analyses, to justify the minimum pressure drop or operating ranges for other monitoring parameters.

(*3*) The landfill gas temperature for a chiller-based de-watering system, the landfill gas dew point for a non-chiller-based de-watering system, or other operating parameters and operating ranges that indicate proper performance of the de-watering system. The collection and control plan must include information, such as manufacturer's recommendations or engineering analyses, to justify the operating ranges for temperature, dew point, or other monitoring parameters.

(E) The Administrator shall review the information submitted under paragraphs (b)(2)(i)(A), (B), (C), and (D) of this section and either approve it, disapprove it, or request that additional information be submitted. Because of the many site-specific factors involved with landfill gas system design, alternative systems may be necessary. A wide variety of system designs are possible, such as vertical wells, combination horizontal and vertical collection systems, or horizontal trenches only, leachate collection components, and passive systems.

(ii) Install and start up a collection and control system that captures the gas generated within the landfill as required by paragraphs (b)(2)(ii)(A) or (B) and (b)(2)(iii) of this section within 30 months after the first annual report in which the emission rate equals or exceeds 40 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the emission rate is less than 40 megagrams per year, as specified in § 60.767(c)(1) or (2).

(A) An active collection system shall:

(*1*) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment;

(*2*) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of:

(*i*) 5 years or more if active; or

(*ii*) 2 years or more if closed or at final grade.

(*3*) Collect gas at a sufficient extraction rate;

(*4*) Be designed to minimize off-site migration of subsurface gas.

(B) A passive collection system shall:

(*1*) Comply with the provisions specified in paragraphs (b)(2)(ii)(A)(*1*), (*2*), and (2)(ii)(A)(*4*) of this section.

(*2*) Be installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners shall be installed as required under § 258.40.

(iii) Route all the collected gas to a control system that complies with the requirements in either paragraph (b)(2)(iii) (A), (B) or (C) of this section.

(A) An non-enclosed flare designed and operated in accordance with § 60.18 except as noted in § 60.764(e);

(B) A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in § 60.764(d). The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts that burn landfill gas for compliance with this subpart.

(*1*) If a boiler or process heater is used as the control device, the landfill gas stream shall be introduced into the flame zone.

(*2*) The control device shall be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in § 60.766;

(C) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or beneficial use such as fuel for combustion, production of vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process. The treated gas must be used as a fuel, or must be used for other beneficial uses such as vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process. Venting of treated landfill gas to the ambient air or combustion in a flare is not allowed under this option. (If flares are used, they must meet § 60.762(b)(2)(iii)(A) or (B)).

(D) All emissions from any atmospheric vent from the gas treatment system shall be subject to the requirements of paragraph (b)(2)(iii)(A) or (B) of this section. For purposes of this subpart, atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of paragraph (b)(2)(iii)(A) or (B) of this section.

(E) Landfill gas that is treated for the uses listed in paragraph (b)(2)(iii)(C) of this section must be treated in a treatment system as defined in § 60.761 that meets the requirements of paragraph (b)(2)(i)(D) of this section. The landfill owner or operator who is treating landfill gas for the uses listed in paragraph (c)(3) of this section must apply for approval of monitoring parameters that demonstrate that the landfill gas is meeting the definition of treated landfill gas in § 60.761. The landfill owner or operator must meet the monitoring, recordkeeping, and reporting requirements listed in §§ 60.766, 60.767, and 60.768 that apply to treatment systems.

(iv) Operate the collection and control device installed to comply with this subpart in accordance with the provisions of §§ 60.763, 60.765 and 60.766.

(v) The collection and control system may be capped or removed provided that all the conditions of paragraphs (b)(2)(v)(A), (B), and (C) of this section are met:

(A) The landfill shall be a closed landfill as defined in § 60.761 of this subpart. A closure report shall be submitted to the Administrator as provided in § 60.767(d);

(B) The collection and control system shall have been in operation a minimum of 15 years; and

(C) Following the procedures specified in § 60.764(b) of this subpart, the calculated NMOC gas produced by the landfill shall be less than 40 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart.

(c) For purposes of obtaining an operating permit under title V of the Act, the owner or operator of a MSW landfill subject to this subpart with a design capacity less than 2.5 million megagrams or 2.5 million cubic meters is not subject to the requirement to obtain an operating permit for the landfill under part 70 or 71 of this chapter, unless the landfill is otherwise subject to either part 70 or 71. For purposes of submitting a timely application for an operating permit under part 70 or 71, the owner or operator of a MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters, and not otherwise subject to either part 70 or 71, becomes subject to the requirements of §§ 70.5(a)(1)(i) or 71.5(a)(1)(i) of this chapter, regardless of when the design capacity report is actually submitted, no later than:

(1) [*DATE 90 DAYS AFTER THE DATE THE FINAL RULE IS PUBLISHED IN THE* ***FEDERAL REGISTER***] for MSW landfills that commenced construction, modification, or reconstruction on or after July 17, 2014 but before [DATE THE FINAL RULE IS PUBLISHED IN THE **FEDERAL REGISTER**];

(2) Ninety days after the date of commenced construction, modification, or reconstruction for MSW landfills that commence construction, modification, or reconstruction on or after [DATE THE FINAL RULE IS PUBLISHED IN THE **FEDERAL REGISTER**].

(d) When a MSW landfill subject to this subpart is closed, the owner or operator is no longer subject to the requirement to maintain an operating permit under part 70 or 71 of this chapter for the landfill if the landfill is not otherwise subject to the requirements of either part 70 or 71 and if either of the following conditions are met:

(1) The landfill was never subject to the requirement for a control system under paragraph (b)(2) of this section; or

(2) The owner or operator meets the conditions for control system removal specified in paragraph (b)(2)(v) of this section.

§ 60.763 Operational standards for collection and control systems.

Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of § 60.762(b)(2)(ii) of this subpart shall:

(a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:

(1) 5 years or more if active; or

(2) 2 years or more if closed or at final grade;

(b) Operate the collection system with negative pressure at each wellhead except under the following conditions:

(1) A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports as provided in § 60.767(f)(1);

(2) Use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the design plan;

(3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the Administrator;

(c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 °C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration must be submitted to the Administrator for approval and must include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens. The demonstration must satisfy both criteria in order to be approved (i.e., neither causing fires nor killing methanogens is acceptable).

(1) The nitrogen level shall be determined using Method 3C, unless an alternative test method is established as allowed by § 60.762(b)(2)(i) of this subpart.

(2) Unless an alternative test method is established as allowed by § 60.762(b)(2)(i) of this subpart, the oxygen shall be determined by an oxygen meter using Method 3A or 3C except that:

(i) The span shall be set so that the regulatory limit is between 20 and 50 percent of the span;

(ii) A data recorder is not required;

(iii) Only two calibration gases are required, a zero and span, and ambient air may be used as the span;

(iv) A calibration error check is not required;

(v) The allowable sample bias, zero drift, and calibration drift are ±10 percent.

(d) Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

(e) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with § 60.762(b)(2)(iii). In the event the collection or control system is not operating, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour; and

(f) Operate the control system at all times when the collected gas is routed to the system.

(g) If monitoring demonstrates that the operational requirements in paragraphs (b), (c), or (d) of this section are not met, corrective action shall be taken as specified in § 60.765(a)(3) through (5) or § 60.765(c) of this subpart. If corrective actions are taken as specified in § 60.765, the monitored exceedance is not a violation of the operational requirements in this section.

§ 60.764 Test methods and procedures.

(a)(1) The landfill owner or operator shall calculate the NMOC emission rate using either the equation provided in paragraph (a)(1)(i) of this section or the equation provided in paragraph (a)(1)(ii) of this section. Both equations may be used if the actual year-to-year solid waste acceptance rate is known, as specified in paragraph (a)(1)(i) of this section, for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown, as specified in paragraph (a)(1)(ii) of this section, for part of the life of the landfill. The values to be used in both equations are 0.05 per year for k, 170 cubic meters per megagram for L_O, and 4,000 parts per million by volume as hexane for the C_{NMOC}. For landfills located in geographical areas with a thirty year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorologic site, the k value to be used is 0.02 per year.

(i) The following equation shall be used if the actual year-to-year solid waste acceptance rate is known.

$$M_{NMOC} = \sum_{i=1}^{n} 2\,k\,L_o M_i \left(e^{-kt_i}\right)\left(C_{NMOC}\right)\left(3.6\times10^{-9}\right)$$

Where:

M_{NMOC} = Total NMOC emission rate from the landfill, megagrams per year.
k = methane generation rate constant, $year^{-1}$.
L_o = methane generation potential, cubic meters per megagram solid waste.
M_i = mass of solid waste in the i^{th} section, megagrams.
t_i = age of the i^{th} section, years.
C_{NMOC} = concentration of NMOC, parts per million by volume as hexane.
3.6×10^{-9} = conversion factor.

The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value for M_i if documentation of the nature and amount of such wastes is maintained.

(ii) The following equation shall be used if the actual year-to-year solid waste acceptance rate is unknown.

$M_{NMOC} = 2L_oR\,(e^{-kc} - e^{-kt})\,C_{NMOC}\,(3.6 \times 10^{-9})$

Where:

M_{NMOC} = mass emission rate of NMOC, megagrams per year.
L_o = methane generation potential, cubic meters per megagram solid waste.
R = average annual acceptance rate, megagrams per year.
k = methane generation rate constant, $year^{-1}$.
t = age of landfill, years.
C_{NMOC} = concentration of NMOC, parts per million by volume as hexane.
c = time since closure, years; for active landfill c = O and $e^{-kc}1$.
$3.6 \times 10-9$ = conversion factor.

The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value of R, if documentation of the nature and amount of such wastes is maintained.

(2) *Tier 1.* The owner or operator shall compare the calculated NMOC mass emission rate to the standard of 40 megagrams per year.

(i) If the NMOC emission rate calculated in paragraph (a)(1) of this section is less than 40 megagrams per year, then the landfill owner shall submit an emission rate report as provided in § 60.767(b)(1), and shall recalculate the NMOC mass emission rate annually as required under § 60.762(b)(1).

(ii) If the calculated NMOC emission rate is equal to or greater than 40 megagrams per year, then the landfill owner shall either comply with § 60.762(b)(2), or determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the procedures provided in paragraph (a)(3) of this section.

(3) *Tier 2.* The landfill owner or operator shall determine the NMOC concentration using the following sampling procedure. The landfill owner or operator shall install at least two sample probes per hectare of landfill surface that has retained waste for at least 2 years. If the landfill is larger than 25 hectares in area, only 50 samples are required. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator shall collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using Method 25 or 25C of appendix A of this part. Taking composite samples from different probes into a single cylinder is allowed; however, equal sample volumes must be taken from each probe. For each composite, the sampling rate, collection times, beginning and ending cylinder vacuums, or alternative volume measurements must be recorded to verify that composite volumes are equal. Composite sample volumes should not be less than one liter unless evidence can be provided to substantiate the accuracy of smaller volumes. Terminate compositing before the cylinder approaches ambient pressure where measurement accuracy diminishes. If more than the required number of samples are taken, all samples must be used in the analysis. The landfill owner or operator must divide the NMOC concentration from Method 25 or 25C of appendix A of this part by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane. If the landfill has an active or passive gas removal system in place, Method 25 or 25C samples may be collected from these systems instead of surface probes provided the removal system can be shown to provide sampling as representative as the two sampling probe per hectare requirement. For active collection systems, samples may be collected from the common header pipe. The sample location on the common header pipe must be before any gas moving, condensate removal, or treatment system equipment. For active collection systems, a minimum of three samples must be collected from the header pipe.

(i) Within 60 days after the date of completing each performance test (as defined in § 60.8), the owner or operator must submit the results of the performance test, including any associated fuel analyses, according to the method specified by either paragraph (a)(3)(i)(A) or (B) of this section.

(A) For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT Web site (*http://www.epa.gov/ttn/chief/ert/index.html*), the owner or operator must submit the results of the performance test to the Compliance and Emissions Data Reporting Interface (CEDRI) accessed through the EPA's Central Data Exchange (CDX) (*http://cdx.epa.gov/epa_home.asp*), unless otherwise approved by the Administrator. Performance test data must be submitted in a file format generated through the use of the EPA's ERT. Owners or operators who claim that some of the performance test information being submitted is confidential business information (CBI) must submit a complete file generated through the use of the EPA's ERT, including information claimed to be CBI, on a compact disc, flash drive, or other commonly used

electronic storage media to the EPA. The electronic media must be clearly marked as CBI and mailed to Roberto Morales, OAQPS Document Control Officer (C404–02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. The same file with the CBI omitted must be submitted to the EPA via CDX as described earlier in this paragraph.

(B) For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT Web site, the owner or operator must submit the results of the performance test to the Administrator at the appropriate address listed in § 60.4.

(ii) The landfill owner or operator shall recalculate the NMOC mass emission rate using the equations provided in paragraph (a)(1)(i) or (a)(1)(ii) of this section and using the average NMOC concentration from the collected samples instead of the default value in the equation provided in paragraph (a)(1) of this section.

(iii) If the resulting mass emission rate calculated using the site-specific NMOC concentration is equal to or greater than 40 megagrams per year, then the landfill owner or operator shall either comply with § 60.762(b)(2), or determine the site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the procedure specified in paragraph (a)(4) of this section.

(iv) If the resulting NMOC mass emission rate is less than 40 megagrams per year, the owner or operator shall submit a periodic estimate of the emission rate report as provided in § 60.767(b)(1) and retest the site-specific NMOC concentration every 5 years using the methods specified in this section.

(4) *Tier 3.* The site-specific methane generation rate constant shall be determined using the procedures provided in Method 2E of appendix A of this part. The landfill owner or operator shall estimate the NMOC mass emission rate using equations in paragraph (a)(1)(i) or (a)(1)(ii) of this section and using a site-specific methane generation rate constant k, and the site-specific NMOC concentration as determined in paragraph (a)(3) of this section instead of the default values provided in paragraph (a)(1) of this section. The landfill owner or operator shall compare the resulting NMOC mass emission rate to the standard of 40 megagrams per year.

(i) If the NMOC mass emission rate as calculated using the site-specific methane generation rate and concentration of NMOC is equal to or greater than 40 megagrams per year, the owner or operator shall comply with § 60.762(b)(2).

(ii) If the NMOC mass emission rate is less than 50 megagrams per year, then the owner or operator shall submit a periodic emission rate report as provided in § 60.767(b)(1) and shall recalculate the NMOC mass emission rate annually, as provided in § 60.767(b)(1) using the equations in paragraph (a)(1) of this section and using the site-specific methane generation rate constant and NMOC concentration obtained in paragraph (a)(3) of this section. The calculation of the methane generation rate constant is performed only once, and the value obtained from this test shall be used in all subsequent annual NMOC emission rate calculations.

(5) The owner or operator may use other methods to determine the NMOC concentration or a site-specific k as an alternative to the methods required in paragraphs (a)(3) and (a)(4) of this section if the method has been approved by the Administrator.

(b) After the installation and startup of a collection and control system in compliance with § 60.765, the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be removed as provided in § 60.762(b)(2)(v), using the following equation:

$$M_{NMOC} = 1.89 \times 10^{-3} Q_{LFG} C_{NMOC}$$

Where:

M_{NMOC} = mass emission rate of NMOC, megagrams per year.

Q_{LFG} = flow rate of landfill gas, cubic meters per minute.

C_{NMOC} = NMOC concentration, parts per million by volume as hexane.

(1) The flow rate of landfill gas, Q_{LFG}, shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control system using a gas flow measuring device calibrated according to the provisions of section 4 of Method 2E of appendix A of this part.

(2) The average NMOC concentration, C_{NMOC}, shall be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25 or Method 25C of appendix A of this part. The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The landfill owner or operator shall divide the NMOC concentration from Method 25 or Method 25C of appendix A of this part by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.

(3) The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the Administrator.

(i) Within 60 days after the date of completing each performance test (as defined in § 60.8), the owner operator must submit the results of the performance test, including any associated fuel analyses, according to the method specified by either paragraph (b)(3)(i)(A) or (B) of this section.

(A) For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT Web site (*http://www.epa.gov/ttn/chief/ert/index.html*), the owner or operator must submit the results of the performance test to the Compliance and Emissions Data Reporting Interface (CEDRI) accessed through the EPA's Central Data Exchange (CDX) (*http://cdx.epa.gov/epa_home.asp*), unless otherwise approved by the Administrator. Performance test data must be submitted in a file format generated through the use of the EPA's ERT. Owners or operators who claim that some of the performance test information being submitted is confidential business information (CBI) must submit a complete file generated through the use of the EPA's ERT, including information claimed to be CBI, on a compact disc, flash drive, or other commonly used electronic storage media to the EPA. The electronic media must be clearly marked as CBI and mailed to: Roberto Morales, OAQPS Document Control Officer (C404–02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. The same file with the CBI omitted must be submitted to the EPA via CDX as described earlier in this paragraph.

(B) For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT Web site, the owner or operator must submit the results of the performance test to the Administrator at the appropriate address listed in § 60.4.

(ii) [Reserved]

(c) When calculating emissions for PSD purposes, the owner or operator of each MSW landfill subject to the provisions of this subpart shall estimate the NMOC emission rate for comparison to the PSD major source and significance levels in §§ 51.166 or 52.21

of this chapter using AP–42 or other approved measurement procedures.

(d) For the performance test required in § 60.762(b)(2)(iii)(B), Method 25 or 25C (Method 25C may be used at the inlet only) of appendix A of this part must be used to determine compliance with the 98 weight-percent efficiency or the 20 ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by § 60.762(b)(2)(i)(B). Method 3 or 3A shall be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. The following equation shall be used to calculate efficiency:

Control Efficiency = ($NMOC_{in}$ − $NMOC_{out}$)/($NMOC_{in}$)

Where:

$NMOC_{in}$ = mass of NMOC entering control device.

$NMOC_{out}$ = mass of NMOC exiting control device.

(e) For the performance test required in § 60.762(b)(2)(iii)(A), the net heating value of the combusted landfill gas as determined in § 60.18(f)(3) is calculated from the concentration of methane in the landfill gas as measured by Method 3C. A minimum of three 30-minute Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under § 60.18(f)(4).

(1) Within 60 days after the date of completing each performance test (as defined in § 60.8), the owner or operator must submit the results of the performance tests, including any associated fuel analyses, required by § 60.764(b) or (d) or this subpart according to the method specified by either paragraph (e)(1)(i) or (ii) of this section.

(i) For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT Web site (*http://www.epa.gov/ttn/chief/ert/index.html*), the owner or operator must submit the results of the performance test to the Compliance and Emissions Data Reporting Interface (CEDRI) accessed through the EPA's Central Data Exchange (CDX) (*http://cdx.epa.gov/epa_home.asp*), unless otherwise approved by the Administrator. Owners or operators who claim that some of the performance test information being submitted is confidential business information (CBI) must submit a complete file generated through the use of the EPA's ERT, including information claimed to be CBI, on a compact disc, flash drive, or other commonly used electronic storage media to the EPA. The electronic media must be clearly marked as CBI and mailed to U.S. EPA/OAPQS/CORE CBI Office, Attention: WebFIRE Administrator, MD C404–02, 4930 Old Page Rd., Durham, NC 27703. The same file with the CBI omitted must be submitted to the EPA via CDX as described earlier in this paragraph.

(ii) For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT Web site, the owner or operator must submit the results of the performance test to the Administrator at the appropriate address listed in § 60.4.

(2) [Reserved]

§ 60.765 Compliance provisions.

(a) Except as provided in § 60.762(b)(2)(i)(B), the specified methods in paragraphs (a)(1) through (a)(6) of this section shall be used to determine whether the gas collection system is in compliance with § 60.762(b)(2)(ii).

(1) For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with § 60.762(b)(2)(ii)(A)(*1*), one of the following equations shall be used. The k and L_o kinetic factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP–42) or other site specific values demonstrated to be appropriate and approved by the Administrator. If k has been determined as specified in § 60.764(a)(4), the value of k determined from the test shall be used. A value of no more than 15 years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.

(i) For sites with unknown year-to-year solid waste acceptance rate:

$$Q_m = 2L_oR\ (e^{-kc} - e^{-kt})$$

Where:

Q_m = maximum expected gas generation flow rate, cubic meters per year.

L_o = methane generation potential, cubic meters per megagram solid waste.

R = average annual acceptance rate, megagrams per year.

k = methane generation rate constant, $year^{-1}$.

t = age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure, t is the age of the landfill at installation, years.

c = time since closure, years (for an active landfill c = O and e^{-kc} = 1).

(ii) For sites with known year-to-year solid waste acceptance rate:

$$Q_M = \sum_{i=1}^{n} 2kL_oM_i(e^{-kt}i)$$

Where:

Q_M = maximum expected gas generation flow rate, cubic meters per year.

k = methane generation rate constant, $year^{-1}$.

L_o = methane generation potential, cubic meters per megagram solid waste.

M_i = mass of solid waste in the ith section, megagrams.

t_i = age of the ith section, years.

(iii) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, the equations in paragraphs (a)(1)(i) and (ii) of this section. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using the equations in paragraphs (a)(1)(i) or (ii) or other methods shall be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

(2) For the purposes of determining sufficient density of gas collectors for compliance with § 60.762(b)(2)(ii)(*A*)(*2*), the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the Administrator, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.

(3) For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with § 60.762(b)(2)(ii)(A)(*3*), the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under § 60.763(b). If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval.

(4) Owners or operators are not required to expand the system as required in paragraph (a)(3) of this

section during the first 180 days after gas collection system startup.

(5) For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in § 60.763(c). If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedance within 5 calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, then either the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance or an alternative timeline shall be submitted. If the owner or operator is unable to correct an exceedance within 15 days, or does not plan to expand the collection and control system within 120 days, then the owner or operator must submit to the Administrator for approval an alternative timeline for correcting the exceedance. The owner or operator must submit an alternative time line for any type of corrective action other than system expansion that will take longer than 15 days. The owner or operator must also submit an alternative time line and justification if they expect a system expansion to take longer than 120 days. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. Any attempted corrective measure shall not cause exceedances of other operational or performance standards.

(6) An owner or operator seeking to demonstrate compliance with § 60.762(b)(2)(ii)(A)(*4*) through the use of a collection system not conforming to the specifications provided in § 60.769 shall provide information satisfactory to the Administrator as specified in § 60.762(b)(2)(i)(C) demonstrating that off-site migration is being controlled.

(b) For purposes of compliance with § 60.763(a), each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan as provided in § 60.762(b)(2)(i). Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:

(1) 5 years or more if active; or

(2) 2 years or more if closed or at final grade.

(c) The following procedures shall be used for compliance with the surface methane operational standard as provided in § 60.763(d).

(1) After installation and startup of the gas collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of this section.

(2) The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.

(3) Surface emission monitoring shall be performed in accordance with section 8.3.1 of Method 21 of appendix A of this part, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions.

(4) Any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified in paragraphs (c)(4)(i) through (v) of this section shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of § 60.763(d).

(i) The location of each monitored exceedance shall be marked and the location and concentration recorded.

(ii) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance.

(iii) If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in paragraph (c)(4)(v) of this section shall be taken, and no further monitoring of that location is required until the action specified in paragraph (c)(4)(v) of this section has been taken.

(iv) Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring specified in paragraph (c)(4)(ii) or (iii) of this section shall be re-monitored 1 month from the initial exceedance. If the 1-month remonitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month remonitoring shows an exceedance, the actions specified in paragraph (c)(4)(iii) or (v) of this section shall be taken.

(v) For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the Administrator for approval.

(5) The owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

(d) Each owner or operator seeking to comply with the provisions in paragraph (c) of this section shall comply with the following instrumentation specifications and procedures for surface emission monitoring devices:

(1) The portable analyzer shall meet the instrument specifications provided in section 3 of Method 21 of appendix A of this part, except that ''methane'' shall replace all references to VOC.

(2) The calibration gas shall be methane, diluted to a nominal concentration of 500 parts per million in air.

(3) To meet the performance evaluation requirements in section 3.1.3 of Method 21 of appendix A of this part, the instrument evaluation procedures of section 4.4 of Method 21 of appendix A of this part shall be used.

(4) The calibration procedures provided in section 4.2 of Method 21 of appendix A of this part shall be followed immediately before commencing a surface monitoring survey.

(e) The provisions of this subpart apply at all times, including periods of startup, shutdown or malfunction.

§ 60.766 Monitoring of operations.

Except as provided in § 60.762(b)(2)(i)(B),

(a) Each owner or operator seeking to comply with § 60.762(b)(2)(ii)(A) for an active gas collection system shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:

(1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in § 60.765(a)(3); and

(2) Monitor nitrogen or oxygen concentration in the landfill gas on a

monthly basis as provided in § 60.765(a)(5); and

(3) Monitor temperature of the landfill gas on a monthly basis as provided in § 60.765(a)(5).

(b) Each owner or operator seeking to comply with § 60.762(b)(2)(iii) using an enclosed combustor shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment.

(1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.

(2) A device that records flow to and bypass of the control device. The owner or operator shall:

(i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(c) Each owner or operator seeking to comply with § 60.762(b)(2)(iii) using a non-enclosed flare shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

(1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame.

(2) A device that records flow to and bypass of the flare. The owner or operator shall:

(i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(d) Each owner or operator seeking to demonstrate compliance with § 60.762(b)(2)(iii) using a device other than a non-enclosed flare or an enclosed combustor or a treatment system shall provide information satisfactory to the Administrator as provided in § 60.762(b)(2)(i)(B) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator shall review the information and either approve it, or request that additional information be submitted. The Administrator may specify additional appropriate monitoring procedures.

(e) Each owner or operator seeking to install a collection system that does not meet the specifications in § 60.769 or seeking to monitor alternative parameters to those required by § 60.763 through § 60.766 shall provide information satisfactory to the Administrator as provided in § 60.762(b)(2)(i)(B) and (C) describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator may specify additional appropriate monitoring procedures.

(f) Each owner or operator seeking to demonstrate compliance with § 60.765(c), shall monitor surface concentrations of methane according to the instrument specifications and procedures provided in § 60.765(d). Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

(g) Each owner or operator seeking to demonstrate compliance with § 60.762(b)(2)(iii) using a landfill gas treatment system must calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment.

(1) A device that monitors pressure drop across, or other approved parameter(s) for, the filtration system that is equipped with a continuous recorder that shall record such parameters at least once every 15 minutes. Records of hourly and 24-hour block averages computed from the continuous monitoring data must also be retained.

(2) A device that monitors the landfill gas temperature for a chiller-based dewatering system, the landfill gas dew point for a non-chiller-based dewatering system, or the approved operating parameter(s) for the dewatering system at the monitoring locations specified in the approved design plan. The temperature measurement device must be located at or immediately after the coalescing filter or other direct contact moisture removal device that follows the chiller and removes the condensed moisture. The dew point monitoring device should be located after the equipment that performs the moisture removal. Each monitoring device must be equipped with a continuous recorder that records such parameters at least once every 15 minutes. Records of hourly and 24-hour block averages computed from the continuous monitoring data must also be retained.

(3) Owners/operators may use monitoring parameters other than those listed in paragraphs (g)(1) and (2) of this section if they demonstrate that such parameters would effectively monitor filtration or de-watering system performance. Owners/operators must develop operating ranges for each monitored operating parameter based on manufacturer's recommendations or engineering analysis and submit those ranges, along with justification, for approval in the design plan required by § 60.762(b)(2). Owners/operators must monitor the required parameters and keep them within the ranges specified in the approved design plan.

(4) A device that records flow to and bypass of the treatment system. The owner or operator must:

(i) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

§ 60.767 Reporting requirements.

Except as provided in § 60.762(b)(2)(i)(B),

(a) Each owner or operator subject to the requirements of this subpart shall submit an initial design capacity report to the Administrator.

(1) The initial design capacity report shall fulfill the requirements of the notification of the date construction is commenced as required by § 60.7(a)(1) and shall be submitted no later than:

(i) [*DATE 90 DAYS AFTER THE DATE THE FINAL RULE IS PUBLISHED IN THE* ***Federal Register***], for landfills that commenced construction, modification, or reconstruction on or after July 17, 2014 but before [DATE

THE FINAL RULE IS PUBLISHED IN THE **Federal Register**] or

(ii) Ninety days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after [DATE THE FINAL RULE IS PUBLISHED IN THE **Federal Register**].

(2) The initial design capacity report shall contain the following information:

(i) A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the permit issued by the state, local, or tribal agency responsible for regulating the landfill.

(ii) The maximum design capacity of the landfill. Where the maximum design capacity is specified in the permit issued by the state, local, or tribal agency responsible for regulating the landfill, a copy of the permit specifying the maximum design capacity may be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity shall be calculated using good engineering practices. The calculations shall be provided, along with the relevant parameters as part of the report. The state, Tribal, local agency or Administrator may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.

(3) An amended design capacity report shall be submitted to the Administrator providing notification of an increase in the design capacity of the landfill, within 90 days of an increase in the maximum design capacity of the landfill to or above 2.5 million megagrams and 2.5 million cubic meters. This increase in design capacity may result from an increase in the permitted volume of the landfill or an increase in the density as documented in the annual recalculation required in § 60.768(f).

(b) Each owner or operator subject to the requirements of this subpart shall submit an NMOC emission rate report to the Administrator initially and annually thereafter, except as provided for in paragraphs (b)(1)(ii) or (b)(3) of this section. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate.

(1) The NMOC emission rate report shall contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in § 60.764(a) or (b), as applicable.

(i) The initial NMOC emission rate report may be combined with the initial design capacity report required in paragraph (a) of this section and shall be submitted no later than indicated in paragraphs (b)(1)(i)(A) and (B) of this section. Subsequent NMOC emission rate reports shall be submitted annually thereafter, except as provided for in paragraphs (b)(1)(ii) and (b)(3) of this section.

(A) [DATE 90 DAYS AFTER THE DATE THE FINAL RULE IS PUBLISHED IN THE **Federal Register**], for landfills that commenced construction, modification, or reconstruction on or after July 17, 2014, but before [DATE THE FINAL RULE IS PUBLISHED IN THE **Federal Register**], or

(B) Ninety days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after [DATE THE FINAL RULE IS PUBLISHED IN THE **Federal Register**].

(ii) If the estimated NMOC emission rate as reported in the annual report to the Administrator is less than 40 megagrams per year in each of the next 5 consecutive years, the owner or operator may elect to submit an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate shall include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based shall be provided to the Administrator. This estimate shall be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised 5-year estimate shall be submitted to the Administrator. The revised estimate shall cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

(2) The NMOC emission rate report shall include all the data, calculations, sample reports and measurements used to estimate the annual or 5-year emissions.

(3) Each owner or operator subject to the requirements of this subpart is exempted from the requirements of paragraphs (b)(1) and (2) of this section, after the installation of a collection and control system in compliance with § 60.762(b)(2), during such time as the collection and control system is in operation and in compliance with §§ 60.763 and 60.765.

(c) Each owner or operator subject to the provisions of § 60.762(b)(2)(i) shall submit a collection and control system design plan to the Administrator within 1 year of the first report required under paragraph (b) of this section in which the emission rate equals or exceeds 40 megagrams per year, except as follows:

(1) If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in § 60.764(a)(3) and the resulting rate is less than 40 megagrams per year, annual periodic reporting shall be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated emission rate is equal to or greater than 40 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated emission rate based on NMOC sampling and analysis, shall be submitted within 180 days of the first calculated exceedance of 40 megagrams per year.

(2) If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant (k), as provided in Tier 3 in § 60.764(a)(4), and the resulting NMOC emission rate is less than 40 Mg/yr, annual periodic reporting shall be resumed. The resulting site-specific methane generation rate constant (k) shall be used in the emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of § 60.764(a)(4) and the resulting site-specific methane generation rate constant (k) shall be submitted to the Administrator within 1 year of the first calculated emission rate exceeding 40 megagrams per year.

(d) Each owner or operator of a controlled landfill shall submit a closure report to the Administrator within 30 days of waste acceptance cessation. The Administrator may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the Administrator, no additional wastes may be placed into the landfill without filing a notification of modification as described under § 60.7(a)(4).

(e) Each owner or operator of a controlled landfill shall submit an equipment removal report to the Administrator 30 days prior to removal or cessation of operation of the control equipment.

(1) The equipment removal report shall contain all of the following items:

(i) A copy of the closure report submitted in accordance with paragraph (d) of this section;

(ii) A copy of the initial performance test report demonstrating that the 15 year minimum control period has expired; and

(iii) Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 40 megagrams or greater of NMOC per year.

(2) The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in § 60.762(b)(2)(v) have been met.

(f) The owner or operator of a landfill seeking to comply with § 60.762(b)(2) using an active collection system designed in accordance with § 60.762(b)(2)(ii) shall submit to the Administrator annual reports of the recorded information in (f)(1) through (f)(6) of this section. The initial annual report shall be submitted within 180 days of installation and startup of the collection and control system, and shall include the initial performance test report required under § 60.8, as applicable. For enclosed combustion devices, flares, and treatment systems reportable exceedances are defined under § 60.768(c).

(1) Value and length of time for exceedance of applicable parameters monitored under § 60.766(a), (b), (c), (d), and (g).

(2) Description and duration of all periods when the gas stream is diverted from the control device or treatment system through a bypass line or the indication of bypass flow as specified under § 60.766.

(3) Description and duration of all periods when the control device or treatment system was not operating and length of time the control device or treatment system was not operating.

(4) All periods when the collection system was not operating.

(5) The location of each exceedance of the 500 parts per million methane concentration as provided in § 60.763(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month.

(6) The date of installation and the location of each well or collection system expansion added pursuant to paragraphs (a)(3), (b), and (c)(4) of § 60.765.

(g) Each owner or operator seeking to comply with § 60.762(b)(2)(iii) shall include the following information with the initial performance test report required under § 60.8:

(1) A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;

(2) The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;

(3) The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;

(4) The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area; and

(5) The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill; and

(6) The provisions for the control of off-site migration.

(h) The owner or operator who has already been required to submit a design plan under § 60.767(c) must submit a revised design plan to the Administrator for approval as follows:

(1) Within 90 days of expanding operations to an area not covered by the previously approved design plan.

(2) Prior to installing or expanding the gas collection system in a way that is not consistent with the design plan that was submitted to the Administrator according to paragraph (c) of this section.

(3) Prior to implementing an approved alternative operating parameter value for temperature, nitrogen, or oxygen, if the owner or operator has requested alternative operating parameter values according to § 60.763(c).

§ 60.768 Recordkeeping requirements.

(a) Except as provided in § 60.762(b)(2)(i)(B), each owner or operator of an MSW landfill subject to the provisions of § 60.762(b) shall keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report which triggered § 60.762(b), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(b) Except as provided in § 60.762(b)(2)(i)(B), each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control system equipment of the data listed in paragraphs (b)(1) through (b)(5) of this section as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal.

(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.762(b)(2)(ii):

(i) The maximum expected gas generation flow rate as calculated in § 60.765(a)(1). The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the Administrator.

(ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in § 60.769(a)(1).

(2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.762(b)(2)(iii) through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts:

(i) The average temperature measured at least every 15 minutes and averaged over the same time period of the performance test.

(ii) The percent reduction of NMOC determined as specified in § 60.762(b)(2)(iii)(B) achieved by the control device.

(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.762(b)(2)(iii)(B)(*1*) through use of a boiler or process heater of any size: A description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing.

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.762(b)(2)(iii)(A) through use of a non-enclosed flare, the flare type (i.e., steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in § 60.18; continuous records of the flare pilot

flame or flare flame monitoring and records of all periods of operations during which the pilot flame of the flare flame is absent.

(5) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 60.762(b)(2)(iii) through use of a landfill gas treatment system:

(i) Hourly and 24-hour block averages computed from the device that monitors pressure drop across, or other approved parameter(s) for, the filtration system.

(ii) Hourly and 24-hour block average temperature (chiller-based system) or dew point (non-chiller based system) or the approved operating parameters for the device that monitors the dewatering system operating parameters.

(iii) Records of exceedances of the treatment system operating parameters that were approved in the design plan as required by § 60.762(b)(2)(i)(D).

(iv) Records of the flow of landfill gas to, and bypass of, the treatment system.

(c) Except as provided in § 60.762(b)(2)(i)(B), each owner or operator of a controlled landfill subject to the provisions of this subpart shall keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in § 60.766 as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.

(1) The following constitute exceedances that shall be recorded and reported under § 60.767(f):

(i) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal unit per hour) or greater, all 3-hour periods of operation during which the average temperature was more than 28 °C below the average combustion temperature during the most recent performance test at which compliance with § 60.762(b)(2)(iii) was determined.

(ii) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under paragraph (b)(3) of this section.

(iii) For treatment systems used to demonstrate compliance with § 60.762(b)(2)(iii), all 24-hour periods of operation during which the average operating parameter values are outside of the approved ranges identified in § 60.762(b)(2)(i)(D) as those that indicate proper performance of the treatment system.

(2) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the indication of flow to the control system and the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under § 60.766.

(3) Each owner or operator subject to the provisions of this subpart who uses a boiler or process heater with a design heat input capacity of 44 megawatts or greater to comply with § 60.762(b)(2)(iii) shall keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. (Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other state, local, Tribal, or federal regulatory requirements.)

(4) Each owner or operator seeking to comply with the provisions of this subpart by use of a non-enclosed flare shall keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under § 60.766(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

(5) Each owner or operator of a landfill seeking to comply with § 60.762(b)(2) using an active collection system designed in accordance with § 60.762(b)(2)(ii) shall keep records of estimates of NMOC emissions for periods when the collection system or control device is not operating.

(d) Except as provided in § 60.762(b)(2)(i)(B), each owner or operator subject to the provisions of this subpart shall keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.

(1) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under § 60.765(b).

(2) Each owner or operator subject to the provisions of this subpart shall keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in § 60.769(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in § 60.769(a)(3)(ii).

(e) Except as provided in § 60.762(b)(2)(i)(B), each owner or operator subject to the provisions of this subpart shall keep for at least 5 years up-to-date, readily accessible records of all collection and control system exceedances of the operational standards in § 60.763, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

(f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, as provided in the definition of ''design capacity'', shall keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

§ 60.769 Specifications for active collection systems.

(a) Each owner or operator seeking to comply with § 60.762(b)(2)(i) shall site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the Administrator as provided in § 60.762(b)(2)(i)(C) and (D):

(1) The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat.

(2) The sufficient density of gas collection devices determined in paragraph (a)(1) of this section shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.

(3) The placement of gas collection devices determined in paragraph (a)(1) of this section shall control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (a)(3)(ii) of this section.

(i) Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under § 60.768(d). The

documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and shall be provided to the Administrator upon request.

(ii) Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material shall be documented and provided to the Administrator upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill.

(A) The NMOC emissions from each section proposed for exclusion shall be computed using the following equation:

$$Q_i = 2\ k\ L_o M_i (e^{-kt_i})\ (C_{NMOC})\ (3.6 \times 10^{-9})$$

Where:

Q_i = NMOC emission rate from the i^{th} section, megagrams per year.

k = methane generation rate constant, $year^{-1}$.

L_o = methane generation potential, cubic meters per megagram solid waste.

M_i = mass of the degradable solid waste in the i^{th} section, megagram.

t_i = age of the solid waste in the i^{th} section, years.

C_{NMOC} = concentration of nonmethane organic compounds, parts per million by volume.

3.6×10^{-9} = conversion factor.

(B) If the owner/operator is proposing to exclude, or cease gas collection and control from, nonproductive physically separated (e.g., separately lined) closed areas that already have gas collection systems, NMOC emissions from each physically separated closed area shall be computed using either the equation in § 60.764(b) or the equation in paragraph (a)(3)(ii)(A) of this section.

(iii) The values for k and C_{NMOC} determined in field testing shall be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (this distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k, L_O and C_{NMOC} provided in § 60.764(a)(1) or the alternative values from § 60.764(a)(5) shall be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in paragraph (a)(3)(i) of this section.

(b) Each owner or operator seeking to comply with § 60.762(b)(2)(i)(A) shall construct the gas collection devices using the following equipment or procedures:

(1) The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: Convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration.

(2) Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.

(3) Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

(c) Each owner or operator seeking to comply with § 60.762(b)(2)(i)(A) shall convey the landfill gas to a control system in compliance with § 60.762(b)(2)(iii) through the collection header pipe(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

(1) For existing collection systems, the flow data shall be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (c)(2) of this section shall be used.

(2) For new collection systems, the maximum flow rate shall be in accordance with § 60.765(a)(1).

[FR Doc. 2014–16405 Filed 7–16–14; 8:45 am]

BILLING CODE 6560–50–P