

# LANDFILL REGULATIONS

## 40 CFR 60 WWW

### Subpart WWW—Standards of Performance for Municipal Solid Waste Landfills

60.750 Applicability, designation of affected facility, and delegation of authority.

### New MSW landfills constructed, modified, or reconstructed on or after 5/30/91

60.751 Definitions.

60.752 Standards for air emissions from municipal solid waste landfills.

**Landfills with a design capacity > 2.5milMG and 2.5 mil M<sup>3</sup> apply for a Title V permit**

**Landfills with a design capacity > 2.5milMG and 2.5 mil M<sup>3</sup> must comply with control requirements or annually calculate NMOC emission rate per calculations in the reg or by using Landgem**

#### If NMOC emissions:

**<50 MG – annual emission calculation submittal required (Tier 1)**

**>50 MG – comply with control requirements or determine site specific NMOC conc and recalculate NMOC emissions (Tier 2)**

**If Tier 2 < 50 MG, retest site specific rate every 5 years**

**If Tier 2 > 50 MG, comply with control req's or determine site specific methane generation rate and recalculate NMOC emissions (Tier 3)**

**<50 MG - submit annual emission rate calculation**

**>50 MG - comply with control requirements**

**When annual emissions are > 50 MG or by owner choice per regulation, submit a collection and control plan within 1 year and install collection and control system within 30 months**

**Collection system – install system in all active areas where initial waste placement is > 5 yrs and in all closed or at final grade areas where initial waste placement is > 2 yrs.**

**Control system - -open flare**

**-Enclosed flare with 98%NMOC reduction or outlet concentration < 20ppmv NMOC**

**-Boiler or engine**

**-Treat gas for sale**

60.753 Operational standards for collection and control systems.

**Collection system -**

**-operate collection system in all active areas where initial waste placement is > 5 yrs and in all closed or at final grade areas where initial waste placement is > 2 yrs.**

**-Operate gas collection wells at negative pressure except during fires, elevated well temperature, when a geomembrane cover is installed, or for decommissioned wells**

**-operate with well gas temperature < 55 degrees C**

**-operate with well concentration of < 20% N<sub>2</sub> or 5% O<sub>2</sub>**

**-conduct quarterly surface scan of landfill to locate and repair leaks > 500ppm methane**

60.754 Test methods and procedures.

**Contains all methods for emission calculations and monitoring methods**

60.755 Compliance provisions.

**Includes specific methods to be used to determine if collection and control system is in compliance**

60.756 Monitoring of operations.

**Gas collection wells -Monthly for pressure, temperature, and O2 or N2**

**-If positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days. 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.**

**Control system – Enclosed combustors - install a temperature monitor and monitor gas flow every 15 minutes or secure bypass line with car seal or lock and inspect monthly to ensure bypass remains closed**

**Open flare –install a heat sensing device and monitor gas flow every 15 minutes or secure bypass line with car seal or lock and inspect monthly to ensure bypass remains closed**

**Other control devices – submit monitoring plan for approval**

**Landfill surface scan – -Quarterly with OVA or FID per Method 21 and calibrated to 500 ppm pentane**

**-Traverse landfill at 30 m intervals with probe 5-10 cm (2-4 in) above surface**

**-For any exceedance > 500ppm, conduct cover maintenance or well vacuum adjustment and remonitoring of area within 10 days**

**-If still >500ppm, conduct cover maintenance or well vacuum adjustment and remonitoring of area within 10 days**

**-Any area that showed an initial exceedance but is <500ppm after remonitoring must remonitor the area the area within 1 month. If < 500ppm, no monitoring until next quarter. If > 500ppm, follow 10 day repair and monitoring procedures**

**-For areas monitored > 500 ppm three times in one quarter, a new well must be installed within 120 days of the initial exceedance or an alternate plan may be submitted for approval**

60.757 Reporting requirements.

**Initial landfill capacity report**

**NMOC report**

**Annual report including exceedances, amount of gas bypassed, control device downtime, collection system non operation > 5 days, surface scan exceedances, and new well additions**

60.758 Recordkeeping requirements.  
60.759 Specifications for active collection systems.

## **40 CFR 60 Cc**

### **Subpart Cc—Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills**

60.30c Scope.  
60.31c Definitions.  
60.32c Designated facilities.  
60.33c Emission guidelines for municipal solid waste landfill emissions.  
60.34c Test methods and procedures.  
60.35c Reporting and recordkeeping guidelines.  
60.36c Compliance times.

**This regulation requires states to enact and implement regulations similar to WWW for MSW landfills that are new, modified or reconstructed before 5/30/91 and accepted waste any time on or after 11/8/87 or has additional capacity available for future waste placement.**

**Check to see if the state has this regulation.**

## **40 CFR 63 AAAA**

### **Subpart AAAA—National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills**

#### **What This Subpart Covers**

63.1930 What is the purpose of this subpart?  
63.1935 Am I subject to this subpart?  
63.1940 What is the affected source of this subpart?  
63.1945 When do I have to comply with this subpart?  
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63.1952 When am I no longer required to comply with the requirements of this subpart if I own or operate a bioreactor?

#### **Standards**

63.1955 What requirements must I meet?

#### **General and Continuing Compliance Requirements**

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63.1985 Who enforces this subpart?  
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#### **Tables to Subpart AAAA of Part 63**

Table 1 of Subpart AAAA of Part 63—Applicability of NESHAP General Provisions to Subpart AAAA

**This regulation was developed as part of the federal urban air toxics program**

**You are subject to this subpart if you own or operate a MSW landfill that has accepted waste since November 8, 1987 or has additional capacity for waste deposition and meets any one of the three criteria in paragraphs (a)(1) through (3) of this section:**

**(1) Your MSW landfill is a major source as defined in 40 CFR 63.2 of subpart A.**

**(2) Your MSW landfill is collocated with a major source as defined in 40 CFR 63.2 of subpart A.**

**(3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m<sup>3</sup>) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to § 60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan that applies to your landfill.**

**Applicability also includes landfills with bioreactors**

**All existing facilities have to be in compliance by now because all compliance dates have passed**

**Compliance requirements**

**-Comply with WWW or Cc**

**-When you have to install a collection system per WWW or Cc, you must also comply with this reg**

**-Annual report required in WWW and Cc must be submitted every 6 months**

**- Prepare and implement a startup, shutdown, and malfunction (SSM) plan**

## **PROPOSED (7/17/14) 40 CFR 60 XXX**

**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.

60.761 Definitions.

60.762 Standards for air emissions from municipal solid waste landfills.

60.763 Operational standards for collection and control systems.

60.764 Test methods and procedures.

60.765 Compliance provisions.

60.766 Monitoring of operations.

60.767 Reporting requirements.

60.768 Recordkeeping requirements.

60.769 Specifications for active collection systems.

**This reg when enacted will apply to any MSW landfill constructed, reconstructed, or modified on or after 7/17/14.**

**The landfill size applicability levels are the same as WWW but the regulatory level for the installation of a gas collection and control system is reduced from 50 to 40 MG NMOC/yr.**

**The reg also proposes a definition of gas treatment systems and additional monitoring requirements.**

## Thresholds for Installing Controls.

The final NSPS retain the current design capacity threshold of 2.5 million megagrams (Mg) and 2.5 million cubic meters (m<sup>3</sup>), but reduce the nonmethane organic compounds (NMOC) emission threshold for the installation and removal of a gas collection and control system (GCCS) from 50 megagrams per year (Mg/yr) to 34 Mg/yr. An MSW landfill that exceeds the design capacity threshold must install and start up a GCCS within 30 months after LFG emissions reach or exceed an NMOC level of 34 Mg/yr. (A megagram is also known as a metric ton, which is equal to 1.1 United States (U.S.) short tons or about 2,205 pounds.) Consistent with the existing NSPS (40 CFR part 60, subpart WWW), 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.

## Emission Threshold Determination.

The EPA is finalizing an alternative site-specific emission threshold methodology for when a landfill must install and operate a GCCS. This alternative methodology, referred to as “Tier 4,” is based on surface emission monitoring (SEM) and demonstrates whether or not surface emissions are below a specific threshold. The Tier 4 SEM demonstration allows landfills that exceed the threshold using modeled NMOC emission rates using Tier 1 or 2 to demonstrate that actual site-specific surface methane emissions are below the threshold. A landfill that can demonstrate that surface emissions are below 500 parts per million (ppm) for four consecutive quarters does not trigger the requirement to install a GCCS even if Tier 1, 2, or 3 calculations indicate that the 34 Mg/yr threshold has been exceeded. Landfills that have calculated NMOC emissions of 50 Mg/yr or greater are not eligible for the Tier 4 emission threshold determination in order to prevent conflicting requirements between subpart XXX and the landfills NESHAP (40 CFR part 63, subpart AAAA). Many landfills that are subject to subpart XXX will also be subject to the landfills NESHAP. The landfills NESHAP requires landfills that exceed the size threshold (2.5 million Mg and 2.5 million m<sup>3</sup>) and exceed the NMOC emissions threshold (50 Mg/yr) to install and operate a GCCS.

## Low LFG Producing Areas.

The EPA is also finalizing criteria for determining when it is appropriate to cap or remove all or a portion of the GCCS. The final criteria for capping or removing all or a portion of the GCCS are: (1) The landfill is closed, (2) the GCCS has operated for at least 15 years or the landfill owner or operator can demonstrate that the GCCS will be unable to operate for 15 years due to declining gas flows, and (3) the calculated NMOC emission rate at the landfill is less than 34 Mg/yr on three successive test dates.

## Landfill Gas Treatment.

In the final NSPS, the EPA has addressed two issues related to LFG treatment. First, the EPA is clarifying that the use of treated LFG is not limited to use as a fuel for a stationary combustion device but may be used for other beneficial uses such as vehicle fuel, production of high British thermal unit (Btu) gas for pipeline injection, or use as a raw material in a chemical manufacturing process. Second, the EPA is finalizing the definition of treated landfill gas that applies to LFG processed in a treatment system meeting the requirements in 40 CFR part 60, subpart XXX and defining treatment system as a system that filters, de-waters, and compresses LFG for sale or beneficial use. The definition of treatment system allows the level of treatment to be tailored to the type and design of the specific combustion equipment or the 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 in which the LFG is used. Owners or operators

must develop a site-specific treatment system monitoring plan that includes 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 LFG. They also must keep records that demonstrate that such parameters effectively monitor filtration, de-watering, and compression system performance necessary for the end use of the treated LFG.

#### Wellhead Operational Standards.

The EPA is finalizing changes to certain operational standards (i.e., the requirement to meet specific operating limits) for nitrogen/oxygen level at the wellheads. Landfill owners or operators are not required to take corrective action based on exceedances of specified operational standards for nitrogen/oxygen levels at wellheads, but they must continue to monitor and maintain records of nitrogen/oxygen levels on a monthly basis in order to inform any necessary adjustments to the GCCS and must maintain records of monthly readings. The operational standard, corrective action, and corresponding recordkeeping and reporting remain for temperature and maintaining negative pressure at the wellhead.

#### Surface Monitoring.

The EPA is finalizing the requirement to monitor all surface penetrations at landfills. In final 40 CFR part 60, subpart XXX, landfills must conduct SEM at all cover penetrations and openings within the area of the landfill where waste has been placed and a gas collection system is required to be in place and operating according to the operational standards in final 40 CFR part 60, subpart XXX. Specifically, landfill owners or operators must conduct surface monitoring on a quarterly basis at the specified intervals and where visual observations indicate elevated concentrations of LFG, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations.

#### Startup, Shutdown, and Malfunction.

The EPA is finalizing a requirement that standards of performance in the NSPS apply at all times, including periods of startup, shutdown, and malfunction (SSM). The EPA is also finalizing an alternative standard during SSM events: 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 that could contribute to venting of the gas to the atmosphere must be closed within 1 hour of the collection or control system not operating.

#### Other Clarifications.

The EPA is finalizing a number of clarifications to address several issues that have been raised by landfill owners or operators during implementation of the current NSPS and Emission Guidelines. These clarifications include adding criteria for when an affected source must update its design plan and clarifying when landfill owners or operators must submit requests to extend the timeline for taking corrective action. The EPA is also updating several definitions in the NSPS. In addition, while the EPA is not mandating organics diversion, we are finalizing two specific compliance flexibilities in the NSPS to encourage wider adoption of organics diversion and GCCS Best Management Practices (BMPs) for emission reductions at landfills. These compliance flexibilities are discussed in sections VI.A.1 and VI.A.2 (wellhead monitoring) and section V.B and VI.B (Tier 4 emission threshold determination) of this preamble.

#### IV. Summary of the Final NSPS A. What are the control requirements?

##### 1. Design Capacity and Emissions Thresholds

The revised NSPS retain the current design capacity threshold of 2.5 million Mg and 2.5 million m<sup>3</sup>, but reduce the NMOC emission threshold for the installation and removal of a GCCS from 50 Mg/yr to 34 Mg/yr for landfills that commence construction, reconstruction, or modification after July 17, 2014. An MSW landfill that exceeds the design capacity threshold must install and start up a GCCS within 30 months after LFG emissions reach or exceed an NMOC level of 34 Mg/yr NMOC. 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.

##### 2. Tier 4

The current NSPS (40 CFR part 60, subpart WWW) provides that owners or operators determine whether the landfill has exceeded the NMOC emissions threshold using one of three available modeling approaches, known as Tiers 1, 2 and 3. The EPA is finalizing in subpart XXX an additional optional methodology based on site-specific surface methane emissions to determine when a landfill must install and operate a GCCS. This alternative emission threshold methodology, referred to as “Tier 4,” is based on SEM and demonstrates that surface methane emissions are below a specific threshold. The Tier 4 SEM demonstration allows certain landfills that exceed modeled NMOC emission rate thresholds using Tier 1 or 2 to demonstrate that site-specific surface methane emissions are below a surface concentration threshold. A landfill that can demonstrate that surface emissions are below 500 ppm for four consecutive quarters does not trigger the requirement to install a GCCS even if Tier 1, 2, or 3 calculations indicate that the 34 Mg/yr threshold has been exceeded. Owners or operators continue to keep detailed records of each quarterly monitoring demonstration and must submit a Tier 4 surface emissions report annually. Upon a surface emissions reading of greater than 500 ppm methane, the landfill must submit a GCCS design plan and install and operate a GCCS.

Tier 4 is based on the results of quarterly site-specific methane emissions monitoring of the perimeter of the landfill and entire surface of the landfill along a pattern that traverses the landfill at 30-meter (98-ft) intervals, in addition to monitoring areas where visual observations may indicate elevated concentrations of LFG, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations. If the landfill opts to use Tier 4 and there is any measured concentration of methane of 500 ppm or greater from the surface of the landfill, the owner or operator must install a GCCS, and the landfill cannot return to Tier 1, 2, or 3 modeling to demonstrate that emissions are below the NMOC threshold.

Tier 4 is allowed only if the landfill owner or operator can demonstrate that NMOC emissions are greater than or equal to 34 Mg/yr, but less than 50 Mg/yr using Tier 1 or Tier 2. If both Tier 1 and Tier 2 indicate NMOC emissions of 50 Mg/yr or greater, Tier 4 cannot be used (a landfill need not model emissions under Tier 3 before using Tier 4). In order to verify that the landfill is eligible for Tier 4, the EPA is finalizing a provision to require landfill owners or operators that choose to use Tier 4 to continue to conduct Tier 1 and Tier 2 NMOC emission rate calculations and report results in the annual report.

In addition, the EPA is finalizing specific requirements for the use of Tier 4 for emission threshold determinations related to wind speed. Since accurate measurements can be

compromised in even moderately windy conditions, the EPA is requiring the owner or operator to use a wind barrier, similar to a funnel or other device, to minimize surface air turbulence when onsite wind speed exceeds the limits in the rule. Thus, when a wind barrier is used, the final rule allows the Tier 4 surface emissions demonstration to proceed when the average onsite wind speed exceeds 4 mph, or gusts exceed 10 mph. Tier 4 measurements cannot be conducted if the average wind speed exceeds 25 mph. Although we are aware of the use of wind barriers in the field, the EPA intends to provide additional guidance on their use. In addition, the owner or operator must take digital photographs of the instrument setup, including the wind barrier. The photographs must be time and date-stamped and taken at the first sampling location prior to sampling and at the last sampling location after sampling at the end of each sampling day, for the duration of the Tier 4 monitoring demonstration. The owner or operator must maintain those photographs per the recordkeeping requirements. Wind speed must be measured with an on-site anemometer with a continuous recorder and data logger for the entire duration of the monitoring event. The average wind speed must be determined at 5-minute intervals. The gust must be determined at 3-second intervals. Further, when taking surface measurements, the sampling probe must be held no more than 5 centimeters above the landfill surface (e.g., using a mechanical device such as a wheel on a pole).

The EPA is also limiting the use of Tier 4 at landfills with a GCCS installed. In order for a landfill with an operational GCCS to qualify for Tier 4, the GCCS must have operated for at least 75 percent of the 12 months prior to initiating Tier 4 testing. The EPA is finalizing reporting and recordkeeping requirements for the annual operating hours of destruction devices in order to verify that a landfill with a GCCS installed and opting for Tier 4 meets the GCCS criteria for having operated the system.

The EPA is also finalizing reporting and recordkeeping requirements to improve the transparency of SEM testing. To ensure that a GCCS is installed in a timely manner, the EPA is requiring a GCCS to be installed and operated within 30 months of the most recent NMOC emission rate report in which the calculated NMOC emission rate equals or exceeds 34 Mg/yr according to Tier 2, once there is any measured concentration of methane of 500 ppm or greater from the surface of the landfill. To improve the transparency of SEM testing, landfill owners or operators must notify the delegated authority 30 days prior to conducting Tier 4 tests and maintain records of all SEM monitoring data and calibrations.

### 3. Criteria for Removing GCCS

Landfill emissions increase as waste is added to a landfill, but decline over time; as waste decays, a landfill produces less and less methane and other pollutants. In the proposed revisions to the NSPS (79 FR 41811), the EPA requested comment on whether the three criteria for control device removal in 40 CFR part 60, subpart WWW were appropriate for proposed 40 CFR part 60, subpart XXX, and whether alternative criteria such as consecutive quarterly measurements below a surface emission threshold should also be considered. Additionally, in the proposed revisions to the Emission Guidelines (80 FR 52112), the EPA recognized that many open landfills subject to control requirements contain inactive areas that have experienced declining LFG flows. The EPA is finalizing criteria for determining when it is appropriate to cap, remove, or decommission a portion of the GCCS. The criteria for capping, removing, or decommissioning the GCCS are: (1) The landfill is closed, (2) the calculated NMOC emission rate at the landfill is less than 34 Mg/yr on three successive test dates, and (3) the GCCS has operated for at least 15 years or the landfill owner or operator can demonstrate that the GCCS will be unable to operate for 15 years due to declining gas flows.

### 4. Excluding Non-productive Areas from Control



In the proposed revisions to the NSPS (79 FR 41817), the EPA recognized 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. Thus, the EPA is finalizing a provision that allows the use of actual flow data when estimating NMOC emissions for the purposes of excluding low- or non-productive areas of the landfill from control. To determine whether NMOC emissions from non-productive 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 non-productive areas, subpart XXX (40 CFR 60.769(a)(3)(ii)) allows owners or operators of landfills with physically separated, closed areas to either model NMOC emission rates, or determine the flow rate of LFG using actual measurements, to determine NMOC emissions. Using actual flow measurements yields a more precise measurement of NMOC emissions for purposes of demonstrating the closed area represents less than 1 percent of the landfill's total NMOC emissions. The NSPS has historically allowed owners or operators to exclude from control areas that are non-productive. In the final rule, the retained the 1 percent criteria level, rather than raising it, to prevent landfills from excluding areas from control unless emissions were very low. But, to help owners or operators demonstrate that a non-productive area may be excluded from control, the final rule allows the owner or operator to use site-specific flow measurements to determine NMOC emissions.

## 5. Landfill Gas Treatment

The EPA is finalizing two provisions related to LFG treatment. First, the EPA is clarifying that the use of treated LFG 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 defining "treated landfill gas" as LFG processed in a treatment system meeting the requirements in 40 CFR part 60, subpart XXX and defining "treatment system" as a system that filters, dewater, and compresses LFG for sale or beneficial use. Owners or operators must develop a site-specific treatment system monitoring plan that includes monitoring parameters addressing all three elements of treatment (filtration, dewatering, and compression) to ensure the treatment system is operating properly for each intended end use of the treated LFG. They also must keep records that demonstrate that such parameters effectively monitor filtration, de-watering, and compression system performance necessary for each end use of the treated LFG. The treatment system monitoring plan must be submitted as part of the landfill's Title V permit application. The permitting authority will review the permit application, including the treatment system monitoring plan, as part of the general permitting process. The treatment system monitoring parameters would be included in the permit as applicable requirements and thus become enforceable conditions (i.e., the landfill monitors the treatment system monitoring parameters and maintains them in the specified range).

### B. What are the monitoring, recordkeeping, and reporting requirements?

#### 1. Wellhead Monitoring

The operational standard, corrective action, and corresponding recordkeeping and reporting remain for temperature and maintaining negative pressure at the wellhead. The EPA is removing the operational standards (i.e., the requirement to meet operating limits) for nitrogen/oxygen at the wellheads. Thus, the EPA is removing the corresponding requirement to take corrective action for exceedances of nitrogen/oxygen at the wellheads. These adjustments to the wellhead monitoring parameters apply to all landfills. Although landfill owners or operators are not required to take corrective action based on exceedances of nitrogen/oxygen levels at wellheads,

they are required to monitor and maintain records of nitrogen/oxygen levels at wellheads on a monthly basis to inform any necessary adjustments to the GCCS and must maintain records of all monthly readings. The landfill owner or operator must make these records available to the Administrator (EPA Administrator or administrator of a state air pollution control agency or his or her designee) upon request.

## 2. Surface Monitoring

The EPA is finalizing the proposed requirement to monitor all surface penetrations. Landfills must conduct SEM at all cover penetrations and openings within the area of the landfill where waste has been placed and a GCCS is required to be in place and operating according to the operational standards in 40 CFR part 60, subpart XXX. Specifically, landfill owners or operators must conduct surface monitoring on a quarterly basis around the entire perimeter of the collection area, and along a pattern that traverses the landfill at no more than 30-meter intervals, at all cover penetrations, and where visual observations may indicate elevated concentrations of LFG, such as distressed vegetation and cracks or seeps in the cover. Cover penetrations include wellheads, but do not include items such as survey stakes, fencing or litter fencing, flags, signs, trees, and utility poles.

## 3. Corrective Action

The owner or operator must measure the LFG temperature at the wellhead and gauge pressure in the gas collection header applied to each individual well on a monthly basis. If there is an exceedance (i.e., LFG temperature of 55 degrees Celsius (131 degrees Fahrenheit) or positive pressure), the owner or operator must initiate corrective action within 5 days. If the temperature exceedance or negative pressure cannot be achieved within 15 days, then the owner or operator must determine the appropriate corrective action by conducting a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after the first measurement of the temperature exceedance or positive pressure. For corrective action that takes longer than 60 days to fully implement, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule for the corrective action that does not exceed 120 days. The owner or operator must also notify the Administrator of any corrective action exceeding 60 days within 75 days and also include a description of the root cause analysis, corrective action analysis and implementation schedule in the annual report. If corrective action is expected to take longer than 120 days after the initial exceedance, the owner or operator must submit the corrective action plan and corresponding implementation timeline to the Administrator for approval within 75 days of the first measurement of positive pressure. Owners or operators must keep records of corrective action analyses. Owners or operators must include corrective action records in the annual compliance report for corrective actions that take greater than 60 days to implement.

## 4. Update and Approval of Design Plan

The EPA is reaffirming some requirements and revising others to address design plans. Design plans must continue to be prepared and approved by a professional engineer. The landfill owner or operator must then notify the Administrator that the plan is completed and provide a copy of the plan's signature page. The Administrator will now have 90 days to make a decision about whether the plan should be submitted for review. If the Administrator chooses to review, the approval process continues as outlined in this section. However, if the Administrator indicates that submission is not required or doesn't respond within 90 days, the landfill owner or operator can continue to implement the plan with the recognition that they are proceeding at their own risk. In the event that the design plan is required to be modified to obtain approval, the

owner/operator must take any steps necessary to conform any prior actions to the approved design plan and any failure to do so could result in an enforcement action.

The EPA is also finalizing two criteria for when an affected source must update its design plan and submit it to the Administrator for approval. A revised design plan must be submitted on the following timeline: (1) Within 90 days of expanding operations to an area not covered by the previously approved design plan; and (2) prior to installing or expanding the gas collection system in a manner other than the one described in the previous design plan. The final rule continues to require landfill owners or operators to prepare both an initial and revised design plan.

## 5. Electronic Reporting

The EPA is requiring owners or operators of new or modified MSW Landfills to submit electronic copies of certain required performance test reports, NMOC emission rate reports, annual reports, Tier 4 emission rate reports, and wet landfilling practices through the EPA's Central Data Exchange (CDX) using the Compliance and Emissions Data Reporting Interface (CEDRI). Owners or operators are allowed to maintain electronic copies of the records in lieu of hardcopies to satisfy federal recordkeeping requirements.

The requirement 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). A listing of the pollutants and test methods supported by the ERT is available at: [www3.epa.gov/ttn/chief/ert/ert\\_info.html](http://www3.epa.gov/ttn/chief/ert/ert_info.html). When the EPA adds new methods to the ERT, a notice will be sent out through the Clearinghouse for Inventories and Emissions Factors (CHIEF) Listserv ([www.epa.gov/air-emissions-inventories/emissionsinventory-listservs](http://www.epa.gov/air-emissions-inventories/emissionsinventory-listservs)) and a notice of availability will be added to the ERT Web site. You are encouraged to check the ERT Web site regularly for up-to-date information on methods supported by the ERT.

The EPA believes that the electronic submittal of the reports addressed in this rulemaking will increase the usefulness of the data contained in those reports, is in keeping with current trends in data availability, will further assist in the protection of public health and the environment and will ultimately result in less burden on the regulated community. Electronic reporting can also eliminate paper-based, manual processes, thereby saving time and resources, simplifying data entry, eliminating redundancies, minimizing data reporting errors and providing data quickly and accurately to the affected facilities, air agencies, the EPA and the public.

The EPA Web site that stores the submitted electronic data, WebFIRE, will be easily accessible to everyone and will provide a user-friendly interface that any stakeholder could access. By making the records, data, and reports addressed in this rulemaking readily available, the EPA, the regulated community, and the public will benefit when the EPA conducts its CAArequired reviews. As a result of having reports readily accessible, our ability to carry out comprehensive reviews will be increased and achieved within a shorter period of time.

We anticipate fewer or less substantial information collection requests (ICRs) in conjunction with prospective CAArequired reviews may be needed. Under an electronic reporting system, the EPA would have air emissions and performance test data in hand; we would not have to collect these data from the regulated industry. The data would provide useful information on actual emissions, types of controls in place, locations of facilities, and other data that the EPA uses in conducting required reviews or future assessments. We expect this to result in a decrease in time spent by industry to respond to data collection requests. We also expect the ICRs to contain less extensive stack testing provisions, as we will already have stack test data electronically. Reduced testing requirements would be a cost savings to industry. The EPA should also be able to conduct

these required reviews more quickly. While the regulated community may benefit from a reduced burden of ICRs, the general public benefits from the agency's ability to provide these required reviews more quickly, resulting in increased public health and environmental protection.

Air agencies could benefit from more streamlined and automated review of the electronically submitted data. 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 spreadsheet format. The ability to access and review air emission report information electronically will assist air agencies to more quickly and accurately determine compliance with the applicable regulations, potentially allowing a faster response to violations which could minimize harmful air emissions. This benefits both air agencies and the general public.

For a more thorough discussion of electronic reporting required by this rule, see the discussion in the 2014 proposed NSPS (79 FR 41818) and the 2015 proposed Emission Guidelines (80 FR 52127). In summary, in addition to supporting regulation development, control strategy development, and other air pollution control activities, having an electronic database populated with performance test data will save industry, air agencies, and the EPA significant time, money, and effort while improving the quality of emission inventories and air quality regulations and enhancing the public's access to this important information.

#### 6. Landfills Recirculating Leachate or Adding Other Liquids

In the 2014 ANPRM and 2015 proposed Emission Guidelines, the EPA solicited input on whether additional action should be taken to address emissions from wet landfills. As discussed in section VI.A.3 of this preamble, there were a wide variety of perspectives provided in the public comments, and while many commenters supported separate thresholds for wet landfills, the EPA did not receive sufficient data to support a separate subcategory for landfills adding leachate or other liquids. In addition, the EPA has several other pending regulatory actions that could affect wet landfills. Accordingly, the EPA believes it is appropriate to further assess emissions from wet landfills prior to taking additional action. Therefore, the EPA is finalizing electronic reporting of additional data elements, as discussed in Section V.A.2 of this preamble, to inform potential action on wet landfills in the future.

#### C. Startup, Shutdown, and Malfunction Provisions

The standards in 40 CFR part 60, subpart XXX apply at all times, including periods of startup or shutdown, and periods of malfunction. The EPA is reaffirming the work practice standard that is applicable during SSM events wherein the landfill owner or operator is required to shut down the gas mover system and close all valves in the collection and control system potentially contributing to the venting of the gas to the atmosphere within 1 hour of the collection or control system not operating. The landfill owner or operator must also keep records and submit reports of all periods when the collection and control device is not operating.

#### D. Other Corrections and Clarifications

The EPA is finalizing the following clarifications and corrections to subpart XXX, which are consistent with the May 23, 2002 and September 8, 2006 proposed amendments to subpart WWW.

Consistent with the May 23, 2002 and September 8, 2006 proposed amendments, the EPA is finalizing 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, the EPA is finalizing the removal of 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 are amending the definition of “household waste” and adding 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.

## **NSPS EG New subpart Cf**

### IV. Summary of the Final Emission Guidelines

#### A. What are the control requirements?

##### 1. Design Capacity and Emissions Thresholds

The revised Emission Guidelines retain the current design capacity thresholds of 2.5 million Mg and 2.5 million m<sup>3</sup>, but reduce the NMOC emission threshold for the installation and removal of a GCCS from 50 Mg/yr to 34 Mg/yr for landfills that are not closed as of **[insert date 13 months after date of publication in the Federal Register]**. An MSW landfill that exceeds the design capacity thresholds must install and start up a GCCS within 30 months after reporting that LFG emissions reach or exceed a NMOC level of 34 Mg/yr NMOC. The owner or operator of a landfill may control the gas by routing it to a nonenclosed flare, an enclosed combustion device, or a treatment system that processes the collected gas for subsequent sale or beneficial use.

##### 2. Tier 4

The current Emission Guidelines (40 CFR part 60, subpart Cc) provide that owners or operators determine whether the landfill has exceeded the NMOC emissions threshold using one of three available modeling procedures, known as Tiers 1, 2, and 3. The EPA is finalizing in subpart Cf an additional optional methodology based on site-specific surface methane emissions to determine when a landfill must install and operate a GCCS. This alternative emission threshold methodology, referred to as “Tier 4,” is based on SEM and demonstrates that surface methane emissions are below a specific threshold. The Tier 4 SEM demonstration allows certain landfills that exceed modeled NMOC emission rates using Tier 1 or 2 to demonstrate that sitespecific surface methane emissions are below a surface concentration threshold (a landfill need not model emissions under Tier 3 before using Tier 4). A landfill that can demonstrate that surface emissions are below 500 ppm for four consecutive quarters does not trigger the requirement to install a GCCS even if Tier 1, 2, or 3 calculations indicate that the 34 Mg/yr threshold has been exceeded. Owners or operators continue to keep detailed records of each quarterly monitoring demonstration and must submit a Tier 4 surface emissions report annually. If a landfill measures a surface emissions reading of greater than 500 ppm methane, the landfill must submit a GCCS design plan and install and operate a GCCS.

Tier 4 is based on the results of quarterly site-specific methane emissions monitoring of the perimeter of the landfill and entire surface of the landfill along a pattern that traverses the landfill at 30-meter (98-ft) intervals, in addition to monitoring areas where visual observations may indicate elevated concentrations of LFG, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations. If the landfill opts to use Tier 4 for its emission threshold

determination and there is any measured concentration of methane of 500 ppm or greater from the surface of the landfill, the owner or operator must install a GCCS, and the landfill cannot go back to using Tiers 1, 2, or 3 modeling to demonstrate that emissions are below the NMOC threshold.

Tier 4 is allowed only if the landfill owner or operator can demonstrate that NMOC emissions are greater than or equal to 34 Mg/yr, but less than 50 Mg/yr using Tier 1 or Tier 2. If both Tier 1 and Tier 2 indicate NMOC emissions of 50 Mg/yr or greater, Tier 4 cannot be used. In addition, a wind barrier must be used for Tier 4 when the average wind speed exceeds 4 miles per hour (mph)(or 2 meters per second), or gusts are above 10 mph. Tier 4 measurements cannot be conducted if the average wind speed exceeds 25 mph. Wind speed must be measured with an onsite anemometer with a continuous recorder and data logger for the entire duration of the monitoring event. The average wind speed must be determined at 5-minute intervals. The gust must be determined at 3-second intervals. Further, when conducting Tier 4 monitoring, the sampling probe must be held no more than 5 centimeters (about 2 inches)above the landfill (e.g., using a mechanical device such as a wheel on a pole). Tier 4 measurements cannot be conducted if the average wind speed exceeds 25 mph

In addition, landfills with a non-regulatory GCCS are allowed to operate the GCCS during the Tier 4 SEM demonstration, however, the GCCS must have operated at least 75 percent of the hours during the 12 months leading up to the Tier 4 SEM demonstration.

### 3. Subcategory of Closed Landfills

Because many landfills are closed and do not produce as much LFG, the EPA is finalizing the proposed subcategory for landfills that close on or before **[insert the date 13 months after the date of final rule publication]**. Landfills in this subcategory will continue to be subject to an NMOC emission threshold of 50 Mg/yr for determining when controls must be installed or can be removed, consistent with the NMOC thresholds in subparts Cc and WWW of 40 CFR part 60. These closed landfills would also be exempt from initial reporting requirements (i.e., initial design capacity, initial NMOC emission rate, GCCS design plan, initial annual report, closure report, equipment removal report, and initial performance test report), provided that the landfill already met these requirements under subparts Cc or WWW of 40 CFR part 60.

### 4. Criteria for Removing GCCS

Landfill emissions increase as waste is added to a landfill, but decline over time; as waste decays, a landfill produces less and less methane and other pollutants. In the proposed Emission Guidelines (80 FR 52112), the EPA recognized that many open landfills subject to the Emission Guidelines contain inactive areas that have experienced declining LFG flows. Therefore, the EPA is finalizing criteria for determining when it is appropriate to cap, remove, or decommission a portion of the GCCS. The criteria for capping, removing, or decommissioning the GCCS are: (1) The landfill is closed, (2) the GCCS has operated for at least 15 years or the landfill owner or operator can demonstrate that the GCCS will be unable to operate for 15 years due to declining gas flows, and (3) the calculated NMOC emission rate at the landfill is less than 34 Mg/yr on three successive test dates. For landfills in the closed subcategory, the NMOC emission rate threshold for removing controls is 50 Mg/yr.

### 5. Excluding Non-productive Areas from Control

The EPA is finalizing a provision that allows the use of actual flow data when estimating NMOC emissions for the purposes of excluding low- or non-producing areas of the landfill from control. Owners or operators of landfills with physically separated, closed areas may either model

NMOC emission rates, or may determine the flow rate of LFG using actual measurements, to determine NMOC emissions. Using actual flow measurements yields a more precise measurement of NMOC emissions for purposes of demonstrating the closed area represents less than 1 percent of the landfills total NMOC emissions. The Emission Guidelines historically allowed owners or operators to exclude from control areas that are non-productive. In this final action, the retained the 1 percent criteria level, rather than raising it, to prevent landfills from excluding areas from control unless emissions were very low. But, to help owners or operators demonstrate that a non-productive area may be excluded from control, the final rule allow the owner or operator to use site specific flow measurements to determine NMOC emissions.

## 6. Landfill Gas Treatment

The EPA is finalizing two provisions related to LFG treatment. First, the EPA is clarifying that the use of treated LFG 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 defining “treated landfill gas” as LFG processed in a treatment system meeting the requirements in 40 CFR part 60, subpart Cf and defining “treatment system” as a system that filters, de-waters, and compresses LFG for sale or beneficial use. Owners or operators must develop a site-specific treatment system monitoring plan that includes monitoring parameters addressing all three elements of treatment (filtration, dewatering, and compression) to ensure the treatment system is operating properly for each intended end use of the treated LFG. They also must keep records that demonstrate that such parameters effectively monitor filtration, de-waters, and compression system performance necessary for each end use of the treated LFG. The treatment system monitoring plan must be submitted as part of the landfill’s title V permit application. The permitting authority will review the permit application, including the treatment system monitoring plan, as part of the general permitting process. The treatment system monitoring parameters would be included in the permit as applicable requirements and thus become enforceable conditions (i.e., the landfill monitors the treatment system monitoring parameters and maintains them in the specified range).

### B. What are the monitoring, recordkeeping, and reporting requirements?

#### 1. Wellhead Monitoring

The operational standard, corrective action, and corresponding recordkeeping and reporting remain for temperature and maintaining negative pressure at the wellhead. The EPA is removing the operational standards for nitrogen/oxygen levels at wellheads. Thus, the EPA is removing the corresponding requirement to take corrective action for exceedances of nitrogen/oxygen at wellheads. These adjustments to the wellhead monitoring parameters apply to all landfills. Although landfill owners or operators are not required to take corrective action based on exceedances of nitrogen/oxygen levels at wellheads, they are required to monitor nitrogen/oxygen levels at wellheads on a monthly basis to inform any necessary adjustments to the GCCS and must maintain records of all monthly readings. The landfill owner or operator must make these records available to the Administrator upon request.

#### 2. Surface Monitoring

The EPA is finalizing the proposed requirement to monitor all surface penetrations. Landfills must conduct SEM at all cover penetrations and openings within the area of the landfill where waste has been placed and a GCCS is required to be in place and operating according to the operational standards in 40 CFR part 60, subpart Cf. Specifically, landfill owners or operators must conduct surface monitoring on a quarterly basis around the perimeter of the collection area

and along a pattern that traverses the landfill at no more than 30 meter intervals, at all cover penetrations, and where visual observations may indicate the presence of elevated concentrations of LFG, such as distressed vegetation and cracks or seeps in the cover. Cover penetrations include wellheads, but do not include items such as survey stakes, fencing or litter fencing, flags, signs, trees, and utility poles.

### 3. Corrective Action

The owner or operator must measure the LFG temperature at the wellhead and gauge pressure in the gas collection header applied to each individual well on a monthly basis. If there is an exceedance (i.e., LFG temperature of 55 degrees Celsius (131 degrees Fahrenheit) or positive pressure), the owner or operator must initiate corrective action within 5 days. If the temperature exceedance or positive pressure cannot be resolved within 15 days, then the owner or operator must determine the appropriate corrective action by conducting a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after the first measurement of the temperature exceedance or positive pressure. For corrective action that takes longer than 60 days to fully implement, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule for the corrective action that does not exceed 120 days. The owner or operator must also notify the Administrator of any corrective action exceeding 60 days within 75 days and also include a description of the root cause analysis, corrective action analysis and implementation schedule in the annual report. If corrective action is expected to take longer than 120 days after the initial exceedance, the owner or operator must submit the corrective action plan and corresponding implementation timeline to the Administrator for approval within 75 days of the first measurement of positive pressure. Owners or operators must keep records of corrective action analyses. Owners or operators must include corrective action records in the annual compliance report for corrective actions that take more than 60 days to implement.

### 4. Update and Approval of Design Plan

The EPA is reaffirming some requirements and revising others to address design plans. Design plans must continue to be prepared and approved by a professional engineer. The landfill owner or operator must then notify the Administrator that the plan is completed and provide a copy of the plan's signature page. The Administrator will now have 90 days to make a decision about whether the plan should be submitted for review. If the Administrator chooses to review, the approval process continues as outlined in this section. However, if the Administrator indicates that submission is not required or doesn't respond within 90 days, the landfill owner or operator can continue to implement the plan with the recognition that they are proceeding at their own risk. In the event that the design plan is required to be modified to obtain approval, the owner/operator must take any steps necessary to conform any prior actions to the approved design plan and any failure to do so could result in an enforcement action.

The EPA is also finalizing two criteria for when an affected source must update its design plan and submit it to the Administrator for approval. A revised design plan must be submitted on the following timeline: (1) Within 90 days of expanding operations to an area not covered by the previously approved design plan; and (2) prior to installing or expanding the gas collection system in a manner other than the one described in the previous design plan. The final rule continues to require landfill owners or operators to prepare both an initial and revised design plan.

### 5. Electronic Reporting



The EPA is requiring owners or operators of existing MSW Landfills to submit electronic copies of certain required performance test reports, NMOC emission rate reports, annual reports, Tier 4 emission rate reports, and wet landfilling practices through the EPA's Central Data Exchange (CDX) using the Compliance and Emissions Data Reporting Interface (CEDRI). Owners or operators are allowed to maintain electronic copies of the records in lieu of hardcopies to satisfy federal recordkeeping requirements.

The requirement 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). A listing of the pollutants and test methods supported by the ERT is available at: [www3.epa.gov/ttn/chief/ert/ert\\_info.html](http://www3.epa.gov/ttn/chief/ert/ert_info.html). When the EPA adds new methods to the ERT, a notice will be sent out through the Clearinghouse for Inventories and Emissions Factors (CHIEF) Listserv ([www.epa.gov/air-emissions-inventories/emissionsinventory-listservs](http://www.epa.gov/air-emissions-inventories/emissionsinventory-listservs)) and a notice of availability will be added to the ERT Web site. You are encouraged to check the ERT Web site regularly for up-to-date information on methods supported by the ERT.

The EPA believes that the electronic submittal of the reports addressed in this rulemaking will increase the usefulness of the data contained in those reports, is in keeping with current trends in data availability, will further assist in the protection of public health and the environment and will ultimately result in less burden on the regulated community. Electronic reporting can also eliminate paper-based, manual processes, thereby saving time and resources, simplifying data entry, eliminating redundancies, minimizing data reporting errors and providing data quickly and accurately to the affected facilities, air agencies, the EPA and the public.

The EPA Web site that stores the submitted electronic data, WebFIRE, will be easily accessible to everyone and will provide a user-friendly interface that any stakeholder could access. By making the records, data, and reports addressed in this rulemaking readily available, the EPA, the regulated community, and the public will benefit when the EPA conducts its CAArequired reviews. As a result of having reports readily accessible, our ability to carry out comprehensive reviews will be increased and achieved within a shorter period of time.

We anticipate fewer or less substantial information collection requests (ICRs) in conjunction with prospective CAArequired reviews may be needed. Under an electronic reporting system, the EPA would have air emissions and performance test data in hand; we would not have to collect these data from the regulated industry. The data would provide useful information on actual emissions, types of controls in place, locations of facilities, and other data that the EPA uses in conducting required reviews or future assessments. We expect this to result in a decrease in time spent by industry to respond to data collection requests. We also expect the ICRs to contain less extensive stack testing provisions, as we will already have stack test data electronically. Reduced testing requirements would be a cost savings to industry. The EPA should also be able to conduct these required reviews more quickly. While the regulated community may benefit from a reduced burden of ICRs, the general public benefits from the agency's ability to provide these required reviews more quickly, resulting in increased public health and environmental protection.

Air agencies could benefit from more streamlined and automated review of the electronically submitted data. 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 spreadsheet format. The ability to access and review air emission report information electronically will assist air agencies to more quickly and accurately determine compliance with the applicable regulations, potentially allowing a faster response to violations which could minimize harmful air emissions. This benefits both air agencies and the general public.

For a more thorough discussion of electronic reporting required by this rule, see the discussion in the proposed NSPS (79 FR 41818) and the 2015 proposed Emission Guidelines (80 FR 52127). In summary, in addition to supporting regulation development, control strategy development, and other air pollution control activities, having an electronic database populated with performance test data will save industry, air agencies, and the EPA significant time, money, and effort while improving the quality of emission inventories and air quality regulations and enhancing the public's access to this important information.

#### 6. Landfills Recirculating Leachate or Adding Other Liquids.

In the ANPRM and proposed Emission Guidelines, the EPA solicited input on whether additional action should be taken to address emissions from wet landfills. As discussed in section VI.A.3 of this preamble, there were a wide variety of perspectives provided in the public comments, and while many commenters supported separate thresholds for wet landfills, the EPA did not receive sufficient data to support a separate subcategory for landfills adding leachate or other liquids. In addition, the EPA has several other pending regulatory actions that could affect wet landfills. Accordingly, the EPA believes it is appropriate to further assess emissions from wet landfills prior to taking additional action. Therefore, the EPA is finalizing electronic reporting of additional data elements, as discussed in Section V.A.3 of this preamble, to inform potential action on wet landfills in the future.

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