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**TITLE 45  
LEGISLATIVE RULE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
AIR QUALITY**

**SERIES 23  
CONTROL OF AIR POLLUTION FROM MUNICIPAL  
SOLID WASTE LANDFILLS**

**§45-23-1. General.**

1.1. Scope. -- This rule establishes and adopts standards of performance pursuant to § 111(b) of the federal Clean Air Act (CAA) and establishes emission guidelines and compliance times pursuant to § 111(d) of the federal CAA for the control of certain designated pollutants from the following municipal solid waste landfill categories:

1.1.a. Municipal solid waste landfills subject to the emission guidelines and compliance times promulgated by the U.S. EPA under 40 CFR Part 60, Subpart Cc and set forth in section 6 of this rule;

1.1.b. Municipal solid waste landfills subject to the standards of performance promulgated by the U.S. EPA under 40 CFR Part 60, Subpart WWW and set forth in section 4 of this rule;

1.1.c. Municipal solid waste landfills subject to the emission guidelines and compliance times promulgated by the U.S. EPA under 40 CFR Part 60, Subpart Cf and set forth in section 7 of this rule; and

1.1.d. Municipal solid waste landfills that commenced construction, reconstruction or modification after July 17, 2014 are subject to the standards of performance promulgated by the U.S. EPA under 40 CFR Part 60, Subpart XXX and set forth in section 5 of this rule;

1.2. Authority. -- W. Va. Code § 22-5-4.

1.3. Filing Date. -- March 22, 2018.

1.4. Effective Date. -- June 1, 2018.

1.5. This rule codifies general procedures and criteria to implement a program of specific standards of performance, emission guidelines, and compliance times for municipal solid waste landfills.

1.6. Neither compliance with the provisions of this rule nor the absence of specific language to cover particular situations constitutes approval or implies consent or condonation of any emission that is released in any locality in such a manner or amount as to cause or contribute to statutory air pollution. Neither does it exempt nor excuse any person from complying with other applicable laws, ordinances, regulations or orders of governmental entities having jurisdiction over municipal solid waste landfills.

1.7. Incorporation by Reference. -- Federal Counterpart Regulation. The Secretary has determined that a federal counterpart rule exists. In accordance with the Secretary's recommendation, and with limited exception, this rule incorporates by reference, 40 CFR Part 60 Subpart XXX effective June 1, 2017.

**§45-23-2. Definitions.**

2.1. "Administrator" means the Administrator of the United States Environmental Protection Agency or his or her designated representative.

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2.2. “CFR” means the Code of Federal Regulations published by the Office of the Federal Register, National Archives and Records Service, General Services Administration.

2.3. “Clean Air Act” or “CAA” means the federal Clean Air Act, as amended, 42 U.S.C. § 7401, et seq.

2.4. “Closed landfill” means a landfill into which solid waste is no longer being placed and into which no additional solid wastes will be placed without first filing a notification of modification as prescribed in 40 CFR § 60.7(a)(4) (incorporated by reference into State law at 45CSR16). Once the owner or operator has filed a notification of modification, and places additional solid waste in the landfill, the landfill is no longer closed.

2.5. “Closed landfill subcategory” means a closed landfill that has submitted a closure report on or before September 27, 2017, as specified in subdivision 7.9.f below

2.6. “Existing” means each municipal solid waste landfill that commenced construction, reconstruction or modification on or before July 17, 2014.

2.7. “Modification” means an increase in the permitted volume design capacity of the landfill by either lateral 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 lateral or vertical expansion.

2.8. “Municipal solid waste landfill” or “MSWL” means an entire disposal facility in a contiguous geographical space where household waste is placed in or on land. A MSWL may also receive other types of Resource Conservation and Recovery Act (RCRA) Subtitle D wastes (40 CFR § 257.2), such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of a MSWL may be separated by access roads. A MSWL may be publicly or privately owned. A MSWL may be a new MSWL, an existing MSWL, or a lateral expansion.

2.9. “Municipal solid waste landfill emissions” or “MSWL emissions” means gas generated by the decomposition of organic waste deposited in a MSWL or derived from the evolution of organic compounds in the waste.

2.10. “NMOC”, (Non Methane Organic Compounds) means nonmethane organic compounds, as measured according to the provisions of subsection 7.6. below.

2.11. “Person” means any and all persons, natural or artificial, including the state of West Virginia or any other state, the United States of America, any municipal, statutory, public or private corporation organized or existing under the laws of this or any other state or country, and any firm, partnership or association of whatever nature.

2.12. “ppm” means parts per million.

2.13. “Secretary” means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8.

2.14. “Treatment System” means a system that filters, de-waters, and compresses landfill gas for sale or beneficial use.

2.15. Other words and phrases used in this rule, unless otherwise indicated, shall have the meaning ascribed to them in 40 CFR Part 60 Subparts A, B, Cc, Cf, WWW and XXX as applicable. Words and

phrases not defined therein shall have the meaning given to them in the federal Clean Air Act.

**§45-23-3. Adoption of standards.**

3.1. The Secretary hereby adopts and incorporates by reference the standards of performance and definitions set forth in 40 CFR Part 60, Subparts B and XXX, including any applicable reference methods, performance specifications, and other test methods, which are appended to these standards and contained in this rule.

**§45-23-4. Requirements for municipal solid waste landfills constructed, modified, or reconstructed on or after May 30, 1991 and before July 17, 2014.**

4.1. The owner or operator of a MSWL under subsection 4.2 below shall comply with all applicable standards of performance, requirements, and provisions of 40 CFR Part 60, Subpart Cf set forth in section 7 of this rule, including any reference methods, performance specifications, and other test methods. No person shall construct or operate a MSWL that results in a violation of this rule.

4.2. Applicability. The designated facility to which section 7 of this rule applies is each MSWL that:

4.2.a. Commenced construction on or after May 30, 1991 and before July 17, 2014; or

4.2.b. Commenced reconstruction or modification on or after May 30, 1991 and before July 17, 2014; and

4.2.c. Was previously subject to 40 CFR Part 60, Subpart WWW.

4.3. Each MSWL that was defined as “new” in the previous revision of 45CSR23 is defined as an “existing” MSWL.

**§45-23-5. Requirements for new municipal solid waste landfills.**

5.1. The owner or operator of a new MSWL under subsection 5.2 below shall comply with all applicable standards of performance, requirements, and provisions of 40 CFR Part 60 Subpart XXX, including any reference methods, performance specifications, and other test methods associated with Subpart XXX. No person shall construct or operate a new MSWL that results in a violation of 40 CFR Part 60, Subpart XXX or this rule.

5.2. Applicability. -- The owner or operator of a MSWL that meets the following criteria shall be subject to the requirements for a new MWSL set forth in section 3 above. A new MSWL is a MSWL that either:

5.2.a. Commenced construction after July 17, 2014; or

5.2.b. Commenced reconstruction or modification after July 17, 2014.

5.3. Physical or operational changes made to a MSWL solely to comply with 40 CFR Part 60, Subparts Cc, Cf, or WWW are not considered construction, reconstruction or modification for the purposes of applicability.

5.4. Activities required by or conducted pursuant to a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), or the West Virginia Voluntary Remediation and Redevelopment Act (VRRRA) are not considered construction or modification for the purposes of applicability.

**§45-23-6. Requirements for existing municipal solid waste landfills constructed, reconstructed, or modified before May 30, 1991.**

6.1. The owner or operator of a MSWL under subsection 6.2 below shall comply with all applicable standards of performance, requirements and provisions of 40 CFR Part 60, Subpart Cf, set forth in section 7 of this rule, including any reference methods, performance specifications, and other test methods. No person shall construct or operate a MSWL that results in a violation of this rule.

6.2. Applicability. The designated facility to which section 7 of this rule applies is each MSWL that:

6.2.a. Commenced construction before May 30, 1991; or

6.2.b. Commenced reconstruction or modification before May 30, 1991; or

6.2.c. Each MSWL that was subject to 40 CFR Part 60, Subpart Cc and the requirements of this rule.

**§45-23-7. Requirements for existing municipal solid waste landfills.**

7.1. Requirements for existing MSWLs. -- The owner or operator of an existing MSWL under subsection 7.2 below shall comply with the applicable compliance times, requirements, and provisions of 40 CFR Part 60 Subpart Cf, set forth in section 7, including any reference methods, performance specifications, and other test methods. No person shall construct, reconstruct, modify or operate, or cause to be reconstructed, modified, or operated, an existing MSWL that results in a violation of this rule.

7.2. Applicability.

7.2.a. Each MSWL that commenced construction, reconstruction or modification before July 17, 2014 is subject to the requirements for an existing MSWL under section 7.

7.2.b. Physical or operational changes made to an existing MSWL solely to comply with the requirements of section 7 are not considered a modification or reconstruction.

7.2.c. Title V operating permits.

7.2.c.1. If the MSWL design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the owner or operator is not required to obtain an operating permit under 45CSR30 unless the MSWL is otherwise subject to 45CSR30.

7.2.c.2. If the MSWL design capacity is greater than 2.5 million megagrams or 2.5 million cubic meters, the owner or operator shall submit a timely and complete permit application in accordance with 45CSR30 within one year of the effective date of this rule.

7.2.c.3. The owner or operator is not required to maintain an operating permit under 45CSR30 for the MSWL after it is closed, if the landfill is not otherwise subject to the requirements of 45CSR30 and if either of the following conditions are met:

7.2.c.3.A. The landfill was never required to install and operate a gas collection and control system under subdivision 7.4 below; or

7.2.c.3.B. The landfill meets the conditions for control system removal specified in subdivision 7.4.f. below.

7.2.d. The owner or operator is not subject to the following reports when a MSWL is in the

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closed landfill subcategory, if the owner or operator submitted the reports under the provisions of 40 CFR Part 60, Subpart WWW, and 45CSR23 on or before July 17, 2014:

7.2.d.1. Initial design capacity report per subdivision 7.9.a.

7.2.d.2. Initial or subsequent NMOC emission rate report per subdivision 7.9.c, provided that the most recent NMOC emission rate report indicated the NMOC emissions were below 50 Mg/yr.

7.2.d.3. Collection and control system design plan per subdivision 7.9.d.

7.2.d.4. Closure report per subdivision 7.9.f.

7.2.d.5. Equipment removal report per subdivision 7.9.g.

7.2.d.6. Initial annual report per subdivision 7.9.h.

7.2.d.7. Initial performance test report per subdivision 7.9.i.

7.2.e. The provisions of section 7 apply at all times, including periods of startup, shutdown or malfunction. During periods of startup, shutdown or malfunction, the owner or operator shall comply with the work practice specified in 7.5.b.5 in lieu of the compliance provisions in 7.7.

7.3. Compliance times. -- The owner or operator shall install and start up MSWL air emission collection and control equipment capable of meeting the requirements provided in subsection 7.4 no later than:

7.3.a. Thirty months after an NMOC emission rate report shows NMOC emissions are equal to or exceed 34 megagrams per year; or

7.3.b. Thirty months after an NMOC emission rate report shows NMOC emissions are equal to or exceed 50 megagrams per year for the closed landfill subcategory; or

7.3.c. Thirty months after the most recent NMOC emission rate report shows NMOC emissions are equal to or exceed 34 megagrams per year, if Tier 4 surface emissions monitoring shows a surface emission concentration of 500 ppm methane or greater.

7.3.d. Thirty months after the most recent NMOC emission rate report shows NMOC emissions are equal to or exceed 50 megagrams per year for the closed landfill subcategory, if Tier 4 surface emissions monitoring shows a surface emission concentration of 500 ppm methane or greater.

7.4. Municipal solid waste landfill emissions requirements.

7.4.a. Each owner or operator of a MSWL with a design capacity greater than or equal to 2.5 million megagrams by mass and 2.5 million cubic meters by volume shall collect and control MSWL emissions at each MSWL that meet the following conditions:

7.4.a.1. The landfill accepted waste at any time after November 8, 1987, or the MSWL has additional design capacity available for future waste deposition;

7.4.a.2. The landfill commenced construction, reconstruction or modification before July 17, 2014;

7.4.a.3. The landfill has an NMOC emission rate greater than or equal to 34 megagrams per year, or Tier 4 surface emissions monitoring shows a surface emission concentration 500 ppm methane or

greater; or

7.4.a.4. The landfill is in the closed landfill subcategory and has an NMOC emission rate greater than or equal to 50 megagrams per year, or Tier 4 surface emissions monitoring shows a surface emission concentration of 500 ppm methane or greater.

7.4.b. Collection system. -- For each MSWL that meets the criteria under subdivision 7.4.a, the gas collection and control system installation shall meet the requirements under paragraphs 7.4.b.1 through 7.4.b.3 and subdivision 7.4.c

7.4.b.1. The owner or operator shall install and start up a collection and control system that captures the gas generated within the landfill within 30 months after:

7.4.b.1.A. The first annual report in which the NMOC emission rate is equal to or exceeds 34 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 34 megagrams per year, per paragraph 7.9.d.4; or

7.4.b.1.B. The first annual NMOC emission rate report for a landfill in the closed landfill subcategory that the NMOC emission rate equals or exceeds 50 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 50 megagrams per year, per paragraph 7.9.d.4; or

7.4.b.1.C. The most recent NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year based on Tier 2, if the Tier 4 surface emissions monitoring shows a surface methane emission concentration of 500 ppm methane or greater per part 7.9.d.4.C.

7.4.b.2. An active collection system shall:

7.4.b.2.A. 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;

7.4.b.2.B. 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 five years or more if active or two years or more if closed or at final grade;

7.4.b.2.C. Collect gas at a sufficient extraction rate; and

7.4.b.2.D. Be designed to minimize off-site migration of subsurface gas.

7.4.b.3. A passive collection system shall:

7.4.b.3.A. Comply with subparagraphs 7.4.b.2.A, 7.4.b.2.B, and 7.4.b.2.D.; and

7.4.b.3.B. Be installed with liners installed on the bottom and all sides in all areas in which gas will be collected, per 40 CFR § 258.40.

7.4.c. Control system. -- Control devices shall meet the following requirements, except as provided in 60 CFR § 60.24.

7.4.c.1. The owner or operator shall design and operate a non-enclosed flare according to the parameters established in 40 CFR § 60.18 and 45CSR16, except as noted in subdivision 7.8.d; or

7.4.c.2. The owner or operator shall design and operate each control system to reduce NMOC by 98 weight percent, or when an enclosed combustion device is used for control, either reduce

NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 ppm by volume, dry basis as hexane at three percent (3%) oxygen or less. The reduction efficiency or concentration in ppm by volume shall be established by an initial performance test using the test methods set out in subdivision 7.6.d and shall be completed no later than 180 days after the initial startup of the approved control system. 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 section 7.

7.4.c.2.A. If a boiler or process heater is used as the control device, the landfill gas stream shall be introduced into the flame zone.

7.4.c.2.B. 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 subsection 7.8.

7.4.c.2.C. For the closed landfill subcategory, the initial or most recent performance test to comply with section 4 or section 6 conducted on or before July 17, 2014 demonstrates compliance.

7.4.c.3. The owner or operator shall 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. Venting of treated landfill gas to the ambient air is not allowed. If the treated landfill gas cannot be routed for subsequent sale or beneficial use, then the treated landfill gas shall be controlled according to either paragraphs 7.4.c.1 or 7.4.c.2.

7.4.c.4. All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of subdivisions 7.4.b or 7.4.c. Atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of subdivisions 7.4.b and 7.4.c.

7.4.d. Design capacity. -- Each owner or operator of an MSWL 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 Secretary per subdivision 7.9.a. The owner or operator may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. The owner or operator shall document any density conversions and submit them with the report. Submittal of the initial design capacity report satisfies the requirements of section 7, except as provided in paragraphs 7.4.d.1 and 7.4.d.2.

7.4.d.1. The owner or operator shall submit an amended design capacity report if required by subdivision 7.9.b.

7.4.d.1.A. If the design capacity increase is the result of a modification that was commenced after July 17, 2014, then the landfill becomes a new MSWL subject to section 5.

7.4.d.1.B. If the design capacity increase is the result of a change in operating practices, density or some other change that is not a modification, then the landfill remains an existing MSWL subject to section 7.

7.4.d.2. The owner or operator shall comply with subdivision 7.4.e if there is an increase in the maximum design capacity of any MSWL with an initial design capacity less than 2.5 million megagrams or 2.5 million cubic meters that has a revised maximum design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters.

7.4.e. Emissions. -- Each owner or operator of a MSWL with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters shall either install a collection and

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control system according to subdivisions 7.4.b and 7.4.c or calculate an initial NMOC emission rate for the landfill using the procedures specified in subdivision 7.6.a. The NMOC emission rate shall be recalculated annually except as provided in paragraph 7.9.c.3.

7.4.e.1. If the calculated NMOC emission rate is less than 34 megagrams per year, the owner or operator shall:

7.4.e.1.A. Submit an annual NMOC emission rate report per 7.9.c except as provided in 7.9.c.3; and

7.4.e.1.B. Recalculate the NMOC emission rate annually per subdivision 7.6.a until either the calculated NMOC emission rate is equal to or greater than 34 megagrams per year or the landfill is closed.

7.4.e.1.B.1. If the initial or annual calculated NMOC emission rate is equal to or greater than 34 megagrams per year, the owner or operator shall either:

7.4.e.1.B.1.(a) Comply with subdivisions 7.4.b and 7.4.c;

7.4.e.1.B.1.(b) Calculate NMOC emissions using the next higher tier in section 7.6; or

7.4.e.1.B.1.(c) Conduct a surface emission monitoring demonstration according to paragraph 7.6.a.11.

7.4.e.1.B.2. The owner or operator shall submit a closure report per subdivision 7.9.f if the landfill is permanently closed, except for the exemption allowed under paragraph 7.2.d.4.

7.4.e.1.B.3. If the most recently calculated NMOC emission rate is equal to or greater than 50 megagrams per year for the closed landfill subcategory, the owner or operator shall either:

7.4.e.1.B.3.(a) Submit a gas collection and control system design plan per 7.9.d, except for the exemptions allowed under paragraph 7.2.d.3, and install a collection and control system per subdivisions 7.4.b and 7.4.c;

7.4.e.1.B.3.(b) Calculate NMOC emissions using the next higher tier in section 7.6; or

7.4.e.1.B.3.(c) Conduct a surface emission monitoring demonstration according to the requirements of paragraph 7.6.a.11.

7.4.e.2. If the calculated NMOC emission rate is equal to or greater than 34 megagrams per year using Tier 1, 2 or 3 procedures, the owner or operator shall either:

7.4.e.2.A. Submit a collection and control system design plan prepared by a professional engineer to the Secretary within one year as required by subdivision 7.9.d, except for the exemption allowed under 7.2.d.3;

7.4.e.2.B. Calculate the NMOC emissions using a higher tier in section 7.6; or

7.4.e.2.C. Conduct a surface emission monitoring demonstration according to the requirements under paragraph 7.6.a.11.

7.4.e.3. For the closed landfill subcategory, if the calculated NMOC emission rate is equal to

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or greater than 50 megagrams per year using Tier 1, 2, or 3 procedures, the owner or operator shall either:

7.4.e.3.A. Submit a collection and control system design plan as required by subdivision 7.9.d, except for the exemption allowed under 7.2.d.3;

7.4.e.3.B. Calculate NMOC emissions using a higher tier in section 7.6; or

7.4.e.3.C. Conduct a surface emission monitoring demonstration according to the requirements under paragraph 7.6.a.11.

7.4.f. Removal Criteria. -- The owner or operator may cap, remove or decommission the collection and control system if the following criteria are met:

7.4.f.1. The landfill is a closed landfill and a closure report was submitted to the Secretary per subdivision 7.9.f.;

7.4.f.2. The collection and control system has been in operation a minimum of 15 years, or the owner or operator can demonstrate that the gas collection and control system is unable to operate for 15 years due to declining gas flow;

7.4.f.3. The NMOC emission rate at the landfill is less than 34 megagrams per year on three successive test dates, calculated per subdivision 7.6.b. The test dates shall be a minimum of 90 days apart and a maximum of 180 days apart; and

7.4.f.4. The NMOC emission rate for the closed landfill subcategory is less than 50 megagrams per year on three successive test dates, as calculated per subdivision 7.6.b. The test dates shall be a minimum of 90 days apart and a maximum of 180 days apart.

### 7.5. Collection and Control Systems Requirements.

#### 7.5.a. Specifications for Active Collection Systems.

7.5.a.1. To comply with subdivision 7.4.b, the owner or operator 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 the Secretary has approved alternative procedures.

7.5.a.1.A. A professional engineer shall certify interior collection devices to achieve comprehensive control of surface gas emissions. The following factors shall be addressed in the design:

7.5.a.1.A.1. Depths of refuse;

7.5.a.1.A.2. Refuse gas generation rates and flow characteristics;

7.5.a.1.A.3. Cover properties;

7.5.a.1.A.4. Gas system expandability;

7.5.a.1.A.5. Leachate and condensate management;

7.5.a.1.A.6. Accessibility;

7.5.a.1.A.7. Compatibility with filling operations;

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7.5.a.1.A.8. Integration with closure end use;

7.5.a.1.A.9. Air intrusion control;

7.5.a.1.A.10. Corrosion resistance;

7.5.a.1.A.11. Fill settlement;

7.5.a.1.A.12. Resistance to the refuse decomposition heat; and

7.5.a.1.A.13. Ability to isolate individual components or sections for repair or troubleshooting without shutting down the entire collection system.

7.5.a.1.B. The sufficient density of gas collection devices determined in paragraph 7.5.a.1 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.

7.5.a.1.C. The placement of gas collection devices shall control all gas producing areas, except as provided by paragraphs 7.5.a.1.C.1 and 7.5.a.1.C.2.

7.5.a.1.C.1. Any segregated area of asbestos or nondegradable material may be excluded from collection if documented per subdivision 7.10.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 Secretary upon request.

7.5.a.1.C.2. Any nonproductive area of the landfill may be excluded from control, provided that the owner or operator demonstrates that the total of all excluded areas contributes less than one percent (1%) of the total amount of NMOC emissions from the landfill. The owner or operator shall document the amount, location, and age of the material and provide that information to the Secretary upon the Secretary's request. The owner or operator shall make a separate NMOC emissions estimate for each section proposed for exclusion and shall compare the sum of all such sections to the NMOC emissions estimate for the entire landfill.

7.5.a.1.C.2.(a). The NMOC emissions from each section proposed for exclusion shall be calculated using Equation 1:

$$Q_i = 2kL_oM_i(e^{-kt_i})(C_{NMOC})(3.6 \times 10^{-9}) \quad (\text{Eq. 1})$$

Where:

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

$k$  = Methane generation rate constant, year<sup>-1</sup>.

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

$M_i$  = Mass of the degradable solid waste in the  $i^{\text{th}}$  section, megagram.

$t_i$  = Age of the solid waste in the section, years.

$C_{NMOC}$  = Concentration of NMOC, ppm by volume.

$3.6 \times 10^{-9}$  = Conversion factor.

7.5.a.1.C.2.(b). If the owner or operator proposes to exclude or cease gas collection and control from nonproductive, physically separated (e.g., separately lined), closed areas that already have gas collection systems, the owner or operator shall calculate NMOC emissions from each physically separated closed area using either Equation 4 in section 7.6 or Equation 1.

7.5.a.1.C.3. The owner or operator shall use the values for  $k$  and  $C_{NMOC}$  determined by field testing if the owner or operator performed field testing to determine the NMOC emission rate or the radii

of influence (the distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If the owner or operator did not perform field testing, the owner or operator shall use the default values for  $k$ ,  $L_o$ , and  $C_{NMOC}$  provided in section 7.6 or the alternative values from section 7.6. The owner or operator may subtract the mass of nondegradable solid waste contained within the given section from the total mass of the section when estimating emissions, provided that the owner or operator documents the nature, location, age, and amount of the nondegradable material per subparagraph 7.5.a.1.C.1.

7.5.a.2. To comply with subdivision 7.4.b, the owner or operator shall construct the gas collection devices using the following equipment or procedures:

7.5.a.2.A. The owner or operator shall construct the landfill gas extraction components of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel or other nonporous corrosion resistant material of suitable dimensions to:

7.5.a.2.A.1. Convey projected amounts of gases;

7.5.a.2.A.2. Withstand installation, static, and settlement forces; and

7.5.a.2.A.3. Withstand planned overburden or traffic loads.

7.5.a.2.A.4. The collection system shall extend as necessary to comply with emission and migration standards.

7.5.a.2.A.5. The 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. The perforations shall be situated to prevent excessive air infiltration.

7.5.a.2.B. Vertical wells shall:

7.5.a.2.B.1 Be placed to avoid endangering underlying liners; and

7.5.a.2.B.2. Shall address the occurrence of water within the landfill.

7.5.a.2.C. Holes and trenches constructed for piped wells and horizontal collectors shall be a sufficient cross-section to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill.

7.5.a.2.D. Collection devices shall be designed to prohibit indirect short circuiting of air into the cover or refuse into the collection system or gas into the air.

7.5.a.2.E. The dimension of any gravel used around pipe perforations shall be sized not to penetrate or block the perforations.

7.5.a.2.F. Collection devices may be connected to the collection header pipes below or above the landfill surface.

7.5.a.2.F.1. The connector assembly surface emission monitor shall include a positive closing throttle valve, any necessary seals and couplings, access couplings, and at least one sampling port.

7.5.a.2.F.2. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel or other nonporous material of suitable thickness to prevent discharge.

7.5.a.3. To comply with subdivision 7.4.c, the owner or operator shall convey the landfill gas

through header piping to a control system in compliance with subdivision 7.4.c. 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 and shall meet the following requirements:

7.5.a.3.A. For existing collection systems, the flow data shall be used to project the maximum flow rate. If flow data does not exist, follow the requirements in 7.5.a.3.B.

7.5.a.3.B. For new collection systems, the maximum flow rate shall comply with paragraph 7.7.a.1.

7.5.b. Operational standards for collection and control systems. -- Each owner or operator of an MSWL with a gas collection and control system used to comply with subdivisions 7.4.b and 7.4.c shall:

7.5.b.1. Operate the collection system such that gas is collected from each area, cell or group of cells in the MSWL that solid waste has been in place for:

7.5.b.1.A. Five years or more if active; or

7.5.b.1.B. Two years or more if closed or at final grade.

7.5.b.2. Operate the collection system with negative pressure at each wellhead except under the following conditions:

7.5.b.2.A. A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. The owner or operator shall submit these records with the annual reports per paragraph 7.9.h.

7.5.b.2.B. Use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the design plan to meet the requirements of 7.9.d.

7.5.b.2.C. A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. The owner or operator shall obtain approval from the Secretary for all design changes per subdivision 7.9.d.

7.5.b.3. The owner or operator shall operate each interior wellhead in the collection system with a landfill gas temperature less than 55 degrees Centigrade (131 degrees Fahrenheit). The owner or operator may establish a higher value operating temperature at a particular well if the owner or operator satisfies all criteria below:

7.5.b.3.a. The owner or operator shall submit a higher operating value demonstration to the Secretary; and

7.5.b.3.b. The supporting data shall demonstrate that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens; and

7.5.b.3.c. The Secretary approved the higher value operating temperature.

7.5.b.4. The owner or operator shall operate the collection system to maintain the methane concentration below 500 ppm above the background at the landfill surface. To determine if this level is exceeded, the owner or operator shall:

7.5.b.4.A. Conduct surface testing using an organic vapor analyzer, flame ionization detector or other portable monitor meeting the specifications in subdivision 7.7.d.;

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7.5.b.4.B. Conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at no more than 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;

7.5.b.4.C. Monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required; and

7.5.b.4.E. Develop a surface monitoring design plan that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30-meter intervals.

7.5.b.4.F. To determine if the level established in 7.5.b.4. is exceeded, the owner or operator may:

7.5.b.4.F.1 Establish an alternative traversing pattern that ensures equivalent coverage.;  
and

7.5.b.4.F.2. Exclude from the surface testing areas with steep slopes or other dangerous areas.

7.5.b.5. Vent all collected gases to a control system designed and operated in compliance with subdivision 7.4.c. In the event the collection or control system stops operating, the owner or operator shall:

7.5.b.5.A. Shut down the gas mover system; and

7.5.b.5.B. Close all valves in the collection and control system contributing to venting of the gas to the atmosphere within one hour of the collection or control system not operating.

7.5.b.6. Operate the control system at all times when the collected gas is routed to the system.

7.5.b.7. Take corrective action as specified in paragraphs 7.7.a.3 and 7.7.a.4 or subdivision 7.7.c if monitoring demonstrates that the operational requirements in paragraphs 7.5.b.2, 7.5.b.3, or 7.5.b.4 are not satisfied. If the owner or operator takes corrective actions per subsection 7.7, the Secretary shall not consider the monitored exceedance a violation of the operational requirements in this section.

### 7.6. Testing requirements

#### 7.6.a. NMOC emission rate:

7.6.a.1. The owner or operator shall calculate the NMOC emission rate using either Equation 2 or Equation 3 below:

7.6.a.2. The owner or operator may use both Equation 2 and Equation 3 if:

7.6.a.2.A. The owner or operator knows the actual year-to-year solid waste acceptance rate for part of the life of the landfill; or

7.6.a.2.B. The owner or operator does not know the actual year-to-year solid waste acceptance rate for part of the life of the landfill.

7.6.a.3. The owner or operator shall use the following values in both Equation 2 and Equation 3:

7.6.a.3.A.  $k$  is 0.05 per year,

7.6.a.3.B.  $L_o$  is 170 cubic meters per megagram and

7.6.a.3.C.  $C_{NMOC}$  is 4,000 ppm by volume as hexane

7.6.a.3.D. If the landfill is located in geographical areas with a 30-year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorological site, the  $k$  value is 0.02 per year.

7.6.a.4. The owner or operator shall use Equation 2 if it knows the actual year-to-year solid waste acceptance rate. When calculating the value for  $M_i$ , the owner or operator may subtract the mass of nondegradable solid waste from the total mass of solid waste in a particular section of the landfill, if the owner or operator maintains documentation of the nature and amount of such wastes.

$$M_{NMOC} = \sum_{i=1}^n 2kL_oM_i (e^{-kt_i})(C_{NMOC})(3.6 \times 10^{-9}) \quad \text{Equation 2}$$

Where:

$M_{NMOC}$  = Total NMOC emission rate from the landfill, megagrams per year.

$k$  = Methane generation rate constant, year<sup>-1</sup>.

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

$M_i$  = Mass of solid waste in the  $i^{\text{th}}$  section, megagrams.

$t_i$  = Age of the  $i^{\text{th}}$  section, years.

$C_{NMOC}$  = Concentration of NMOC, ppm by volume as hexane.

$3.6 \times 10^{-9}$  = Conversion factor.

7.6.a.5. The owner or operator shall use Equation 3 if it knows the actual year-to-year solid waste acceptance rate. When calculating the value of  $R$ , the owner or operator may subtract the mass of nondegradable solid waste from the total mass of solid waste in a particular section of the landfill, if the owner or operator maintains documentation of the nature and amount of such wastes.

$$M_{NMOC} = 2L_oR(e^{-kc} - e^{-kt})C_{NMOC}(3.6 \times 10^{-9}) \quad \text{Equation 3}$$

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<sup>-1</sup>.

$t$  = Age of landfill, years.

$C_{NMOC}$  = Concentration of NMOC, ppm by volume as hexane.

$c$  = Time since closure, years; for an active landfill  $c = 0$  and  $e^{-kc} = 1$ .

$3.6 \times 10^{-9}$  = Conversion factor.

7.6.a.6. Tier 1 procedures. -- The owner or operator shall compare the calculated NMOC mass emission rate to the standard of 34 megagrams per year:

7.6.a.6.A. If the owner or operator calculates the NMOC emission rate by the methods specified in paragraphs 7.6.a.1 through 7.6.a.3 and it is less than 34 megagrams per year, then the owner or operator shall submit an NMOC emission rate report according to subdivision 7.9.c. below and shall recalculate the NMOC mass emission rate annually as required by subdivision 7.4.e.

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7.6.a.6.B. If the owner or operator calculates the NMOC emission rate by the methods specified in paragraphs 7.6.a.1 through 7.6.a.3 and it is equal to or greater than 34 megagrams per year, then the owner or operator shall either:

7.6.a.6.B.1. Submit a gas collection and control system design plan within one year as specified in subdivision 7.9.d and install and operate a gas collection and control system within 30 months according to subdivisions 7.4.b and 7.4.c; or

7.6.a.6.B.2. Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the Tier 2 procedures in paragraph 7.6.a.7; or

7.6.a.6.B.3. Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the Tier 3 procedures in paragraph 7.6.a.9.

7.6.a.7. Tier 2 -- NMOC Calculation. The owner or operator shall determine the site specific NMOC concentration using the following sampling procedure:

7.6.a.7.A. Install a minimum of two sample probes per hectare, evenly distributed over the landfill surface that has retained waste for at least two years;

7.6.a.7.B. If the landfill is larger than 25 hectares in area, the owner or operator is required to take only 50 samples, with the probes evenly distributed across the sample area;

7.6.a.7.C. The owner or operator should locate the sample probes so as to avoid known areas of nondegradable solid waste;

7.6.a.7.D. 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 40 CFR Part 60, Appendix A and 45CSR16;

7.6.a.7.E. The owner or operator may take composite samples from different probes into a single cylinder: provided, that the owner or operator takes equal sample volumes from each probe and:

7.6.a.7.E.1. The owner or operator shall record the sampling rate, collection times, beginning and ending cylinder vacuums or alternative volume measurements for each composite to verify that composite volumes are equal;

7.6.a.7.E.2. Composite sample volumes should not be less than one liter unless the owner or operator can provide evidence to substantiate the accuracy of smaller volumes; and

7.6.a.7.E.3. The owner or operator shall terminate compositing before the cylinder approaches ambient pressure when the measurement accuracy diminishes.

7.6.a.7.F. If the owner or operator takes more than the required number of samples, the owner or operator shall use all samples in the analysis.

7.6.a.7.G. The owner or operator shall divide the NMOC concentration from Method 25 or 25C by six to convert from  $C_{\text{NMOC}}$  as carbon to  $C_{\text{NMOC}}$  as hexane.

7.6.a.7.H. If the landfill has an active or passive gas removal system in place, the owner or operator may collect Method 25 or 25C samples from these systems instead of surface probes: provided, that the owner or operator can demonstrate that the removal system sampling is as representative as the two sampling probe per hectare requirement of subparagraph 7.6.a.7.A.

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7.6.a.7.I. If the landfill has active collection systems, the owner or operator may collect samples from the common header pipe according to the following:

7.6.a.7.I.1. The owner or operator shall use a sample location upstream from any gas moving, condensate removal or treatment system equipment; and

7.6.a.7.I.2. The owner or operator shall collect a minimum of three samples.

7.6.a.8. Tier 2 procedures.

7.6.a.8.A. The owner or operator shall submit the NMOC concentration results and the NMOC mass emission rate per paragraph 7.9.j.2 within 60 days from the date the owner or operator determined the NMOC concentration and corresponding NMOC emission rate.

7.6.a.8.B. The owner or operator shall recalculate the NMOC mass emission rate using Equation 2 or Equation 3 using the average site-specific NMOC concentration from the collected samples instead of the default value provided in paragraph 7.6.a.3.

7.6.a.8.C. If the resulting NMOC mass emission rate is less than 34 megagrams per year, the owner or operator shall submit an estimate of NMOC emissions in the NMOC emission rate report according to subdivision 7.9.c and shall recalculate the NMOC mass emission rate annually per subdivision 7.4.e. The owner or operator shall retest the site-specific NMOC concentration every five years using the methods specified in subsection 7.6.

7.6.a.8.D. If the owner or operator calculates the NMOC mass emission rate using the Tier 2 site specific NMOC concentration and it is equal to or greater than 34 megagrams per year, the owner or operator shall either:

7.6.a.8.D.1. Submit a gas collection and control system design plan within one year per subdivision 7.9.d and install and operate a gas collection and control system within 30 months per subdivisions 7.4.b and 7.4.c;

7.6.a.8.D.2. Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the site specific methane generation rate using the Tier 3 procedures specified in paragraph 7.6.a.9.; and

7.6.a.8.D.3. Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in paragraph 7.6.a.11.

7.6.a.9. Tier 3. -- Site specific methane generate rate constant. The owner or operator shall:

7.6.a.9.A. Determine the site-specific methane generation rate constant using the procedures in Method 2E of 40 CFR Part 60, Appendix A and 45CSR16;

7.6.a.9.B. Estimate the NMOC mass emission rate using Equation 2 or Equation 3 with the site-specific methane generation rate constant and the site-specific NMOC concentration as determined in paragraph 7.6.a.7;

7.6.a.9.C. Compare the resulting NMOC mass emission rate to the standard of 34 megagrams per year;

7.6.a.9.D. If the NMOC mass emission rate calculated using the Tier 2 site specific NMOC concentration and the Tier 3 site specific methane generation rate is equal to or greater than 34 megagrams per year, either:

7.6.a.9.D.1. Submit a gas collection and control system design plan within one year as per subdivision 7.9.d and install and operate a gas collection and control system within 30 months according to subdivisions 7.4.b and 7.4.c; or

7.6.a.9.D.2. Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in paragraph 7.6.a.11.

7.6.a.9.E. If the NMOC mass emission rate is less than 34 megagrams per year, the owner or operator shall:

7.6.a.9.E.1. Recalculate the NMOC mass emission rate annually using Equation 2 or Equation 3, using the site-specific Tier 2 NMOC concentration and the Tier 3 methane generation rate constant; and

7.6.a.9.E.2. Submit the NMOC emission rate report per subdivision 7.9.c.

7.6.a.9.F. Use the value obtained for the methane generation rate constant in all subsequent annual NMOC emission rate calculations. The methane generation rate constant is calculated only once.

7.6.a.10. Other methods. -- The owner or operator may use other methods to determine the NMOC concentration or a site specific methane generation rate constant as an alternative to the methods required by paragraphs 7.6.a.3 and 7.6.a.4 if the Administrator approved the method in advance.

7.6.a.11. Tier 4. -- Surface emission monitoring demonstration.

7.6.a.11.A. Applicability. The owner or operator shall only use Tier 4 procedures if the unit can demonstrate the following:

7.6.a.11.A.1. Surface methane emissions are below 500 ppm;

7.6.a.11.A.2. NMOC emissions are greater than or equal to 34 Mg/yr but less than 50 Mg/yr using Tier 1 or Tier 2 procedures;

7.6.a.11.A.3. The landfill meets the requirements of subparagraph 7.6.a.11.J below;  
and

7.6.a.11.A.4. NMOC emissions are less than 50Mg/yr as indicated by both Tier 1 and Tier 2; if NMOC emissions are greater than 50Mg/yr, the owner or operator shall not use Tier 4.

7.6.a.11.B. The owner or operator shall conduct surface emission monitoring quarterly according to the requirements in paragraph 7.6.a.11.

7.6.a.11.C. The owner or operator shall measure methane surface concentrations using an organic vapor analyzer, flame ionization detector or other portable monitor that meets the requirements of subdivision 7.7.d along the entire perimeter of the landfill and along a pattern that traverses the landfill at less than 30 meter intervals.

7.6.a.11.D. The owner or operator shall determine the background concentration by moving the probe inlet upwind and downwind at least 30 meters from the waste mass boundary of the landfill.

7.6.a.11.E. The owner or operator shall perform surface emission monitoring per Section

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8.3.1 of Method 21 of 40 CFR Part 60, Appendix A and 45CSR16, except that the probe inlet shall be placed no more than five centimeters above the landfill surface and measured with a mechanical device such as a wheel on a pole.

7.6.a.11.E.1. The owner or operator shall use a wind barrier, similar to a funnel, when onsite average wind speed exceeds four miles per hour or two meters per second or gusts exceeding ten miles per hour. The owner or operator shall also determine average on-site wind speed in an open area at five minute intervals using an on-site anemometer with a continuous recorder and data logger for the entire duration of the monitoring event. The wind barrier shall surround the surface emission monitor and shall be placed on the ground to ensure wind turbulence is blocked. The owner or operator shall not conduct surface emission monitoring if average wind speed exceeds 25 miles per hour.

7.6.a.11.E.2. The owner or operator shall monitor landfill surface areas using a device that meets the specifications of subdivision 7.7.d where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover, and all cover penetrations.

7.6.a.11.F. The owner or operator shall maintain records of surface emission monitoring per subdivision 7.10.g and submit a Tier 4 surface emissions report per subparagraph 7.9.d.4.C.

7.6.a.11.G. The owner or operator shall submit a gas collection and control system design plan if there is any measured methane 500 ppm or greater from the surface of the landfill within one year of the first measured methane concentration of 500 ppm or greater from the surface of the landfill according to subdivision 7.9.d. The owner or operator shall install and operate a gas collection and control system according to subdivisions 7.4.b and 7.4.c within 30 months of the most recent NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year based on Tier 2 requirements.

7.6.a.11.H. After four consecutive quarterly monitoring periods at a landfill, other than a closed landfill, if there is no measured methane concentration of 500 ppm or greater from the landfill surface, the owner or operator shall continue quarterly surface emission monitoring per Tier 4 requirements.

7.6.a.11.I. After four consecutive quarterly monitoring periods at a closed landfill, if there is no measured methane concentration of 500 ppm or greater from the landfill surface, the owner or operator shall conduct annual surface emission monitoring using the Tier 4 methods.

7.6.a.11.J. If the owner or operator installed and operated a collection and control system that is not required by section 7, then the collection and control system shall meet the following criteria:

7.6.a.11.J.1. Preceding the Tier 4 surface emissions monitoring demonstration, the gas collection and control system shall have operated for a minimum 6,570 out of 8,760 hours; and

7.6.a.11.J.2. During the Tier 4 surface emissions monitoring demonstration, the gas collection and control system shall operate as it would normally to collect and control as much landfill gas as possible.

7.6.b. The owner or operator shall calculate the NMOC emission rate after the installation and startup of a collection and control system to determine when the system can be capped, removed or decommissioned per subdivision 7.4.f, using Equation 4:

$$M_{NMOC} = 1.89 \times 10^{-3} Q_{LFG} C_{NMOC} \quad \text{Equation 4}$$

Where:

$M_{\text{NMOC}}$  = Mass emission rate of NMOC, megagrams per year.

$Q_{\text{LFG}}$  = Flow rate of landfill gas, cubic meters per minute.

$C_{\text{NMOC}}$  = NMOC concentration, ppm by volume as hexane.

7.6.b.1. The owner or operator shall determine the flow rate of landfill gas,  $Q_{\text{LFG}}$ , by measuring the total landfill gas flow rate at the common header pipe leading to the control system using a gas flow measuring device calibrated per Section 10 of Method 2E of 40 CFR Part 60, Appendix A and 45CSR16.

7.6.b.2. The owner or operator shall determine the average NMOC concentration,  $C_{\text{NMOC}}$ , by collecting and analyzing landfill gas sampled from the common header pipe prior to the gas moving or condensate removal equipment per Method 25 or 25C of 40 CFR Part 60, Appendix A and 45CSR16. The sample location on the common header pipe shall be prior to any condensate removal or other gas refining units. The owner or operator shall divide the NMOC concentration from Method 25 or 25C by six to convert from  $C_{\text{NMOC}}$  as carbon to  $C_{\text{NMOC}}$  as hexane.

7.6.b.3. The owner or operator may use another method to determine:

7.6.b.3.A. Landfill gas flow rate if the owner or operator received prior approval for the alternate method by the Administrator; and

7.6.b.3.B. NMOC concentration if the owner or operator received prior approval for the alternate method by the Administrator.

7.6.b.4. The owner or operator shall submit the results from Equation 4 within 60 days after the date of calculating the NMOC emission rate per paragraph 7.9.j.2.

7.6.c. When calculating emissions for Prevention of Significant Deterioration purposes, the owner or operator shall estimate the NMOC emission rate for comparison to the Prevention of Significant Deterioration major source and significance levels in 45CSR14 using the Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources (AP-42) or other approved measurement procedures.

7.6.d. For the performance test required by paragraph 7.4.c.2, the owner or operator shall calculate the net heating value of the combusted landfill gas as determined in 40 CFR § 60.18(f)(3) and 45CSR16 from the methane concentration in the landfill gas as measured by Method 3C. The owner or operator shall take a minimum of three 30-minute Method 3C samples, but need not take the measurement of other organic components, hydrogen, and carbon monoxide. The owner or operator may use Method 3C determine the landfill gas molecular weight for calculating the flare gas exit velocity under 40 CFR § 60.18(f)(4).

7.6.e. For the performance test required by paragraph 7.4.c.2, the owner or operator shall use Method 25 or 25C (the owner or operator may use Method 25C at the inlet only) of 40 CFR Part 60, Appendix A and 45CSR16 to determine compliance with the 98 weight-percent efficiency or the 20 ppm by volume outlet NMOC concentration level, unless the owner or operator received prior approval by the Administrator for an alternative method per paragraph 7.9.d.2. The owner or operator shall use Method 3, 3A or 3C to determine oxygen for correcting the NMOC concentration as hexane to three percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (eight ppm NMOC as hexane), the owner or operator shall use Method 25A in place of Method 25. The owner or operator may use Method 18 in conjunction with Method 25A on a limited basis (compound specific, e.g., methane) or Method 3C to determine methane. The owner or operator shall subtract methane as carbon from the Method 25A total hydrocarbon value as carbon to give NMOC concentration as carbon. The owner or

operator shall divide the NMOC concentration as carbon by six to convert the  $C_{NMOC}$  as carbon to  $C_{NMOC}$  as hexane. The owner or operator shall use Equation 5 to calculate efficiency:

$$Control\ Efficiency = \frac{(NMOC_{in} - NMOC_{out})}{(NMOC_{in})} \quad Equation\ 5$$

Where:

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

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

7.6.f. Within 60 days after the date of completing each performance test according to subdivisions 7.6.d and 7.6.e, the owner or operator shall submit the performance test results required by subdivision 7.6.b or 7.6.d, including any associated fuel analyses per paragraph 7.9.j.1.

7.7. Compliance requirements.

7.7.a. The owner or operator shall use the specified methods in subdivisions 7.7.a.1 through 7.7.a.6, except as provided in paragraph 7.9.d.2, to determine whether the gas collection system is in compliance with paragraph 7.4.b.2.

7.7.a.1. To determine compliance with subparagraph 7.4.b.2.A, the owner or operator shall use either Equation 6 or Equation 7 to calculate the maximum expected gas generation flow rate from the landfill. The owner or operator shall use the methane generation rate constant (k) and methane generation potential ( $L_o$ ) kinetic factors published in the most recent AP-42 or other site specific values the owner or operator has demonstrated to be appropriate and that the Secretary has approved. The owner or operator shall use the value of k determined from the test if k was determined as specified in paragraph 7.6.a.9. The owner or operator shall use a value of no more than 15 years 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.

7.7.a.1.A. For sites with unknown year-to year solid waste acceptance rate:

$$Q_m = 2L_o R(e^{-kc} - e^{-kt}) \quad Equation\ 6$$

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<sup>-1</sup>.

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 = 0 and  $e^{-kc} = 1$ ).

7.7.a.1.B. For sites with known year-to-year solid waste acceptance rate:

$$Q_m = \sum_{i=1}^n 2kL_o M_i(e^{-kti}) \quad Equation\ 7$$

Where:

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

k = Methane generation rate constant, year<sup>-1</sup>.

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

$M_i$  = Mass of solid waste in the  $i^{\text{th}}$  section, megagrams.

$t_i$  = Age of the  $i^{\text{th}}$  section, years.

7.7.a.1.C. The owner or operator may use the actual flow data to project the maximum expected gas generation flow rate instead of, or in conjunction with, Equation 6 or Equation 7 if the owner or operator installed a collection and control system. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so the owner or operator shall use calculations using Equation 6 or Equation 7 or other methods to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

7.7.a.2. To demonstrate compliance with subparagraph 7.4.b.2.B determining the sufficient density of gas collectors, the owner or operator shall design a system of vertical wells, horizontal collectors or other collection devices satisfactory to the Secretary that is capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.

7.7.a.3. To demonstrate compliance with subparagraph 7.4.b.2.C, the owner or operator shall measure gauge pressure in the gas collection header applied to each individual well monthly to determine whether the gas collection system flow rate is sufficient. If a positive pressure exists, the owner or operator shall initiate action to correct the exceedance within five calendar days, except for the three conditions allowed under subdivision 7.5.b.2 below. The owner or operator shall not cause exceedances of other operational or performance standards by use of any attempted corrective measure.

7.7.a.3.A. If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement of positive pressure, the owner or operator shall conduct a root cause analysis and correct the exceedance as soon as practicable, but not later than 60 days after the first measure of positive pressure. The owner or operator shall keep records per paragraph 7.10.e.3 below.

7.7.a.3.B. If the owner or operator cannot fully implement corrective actions within 60 days following the positive pressure measurement for which the root cause analysis was required, the owner or operator shall conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the positive pressure measurement. The owner or operator shall keep records per paragraph 7.10.e.4 below and submit the items required by paragraph 7.9.h.7 in the next annual report.

7.7.a.3.C. If the owner or operator expects corrective action to take longer than 120 days after the initial exceedance to complete, the owner or operator shall submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Secretary according to paragraphs 7.9.h.7 and 7.9.k and keep records according to paragraph 7.10.e.5.

7.7.a.4. To determine whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature according to paragraph 7.5.b.3 above. If a well exceeds the operating parameter for temperature, the owner or operator shall initiate action to correct the exceedance within five calendar days. Attempted corrective measures shall not cause exceedances of other operational or performance standards.

7.7.a.4.A. If the owner or operator cannot achieve a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit) within 15 calendar days of the first measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit), the owner or operator shall conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after the first measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit). The owner or operator shall maintain records per paragraph 7.10.e.3 below.

7.7.a.4.B. If the owner or operator cannot fully implement corrective actions within 60 days following the measurement for which the root cause analysis was required, the owner or operator shall also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit). The owner or operator shall maintain records per paragraph 7.10.e.4 and submit the information listed in paragraph 7.9.h.7 in the next annual report.

7.7.a.4.C. If the owner or operator expects corrective action to take longer than 120 days after the initial exceedance to complete, the owner or operator shall submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Secretary according to paragraph 7.9.h.7 and subdivision 7.9.k and maintain records per paragraph 7.10.e.5.

7.7.a.5. An owner or operator seeking to demonstrate compliance with subparagraph 7.4.b.2.D through the use of a collection system that does not meet the specifications of subdivision 7.5.a shall provide information satisfactory to the Administrator according to paragraph 7.9.d.3 demonstrating that the owner or operator is controlling off-site migration.

7.7.b. To comply with paragraph 7.5.b.1, the owner or operator shall place each well or design component as specified in the approved design plan per subdivision 7.9.d. The owner or operator shall install each well no later than 60 days after the date on which the initial solid waste has been in place for a period of:

7.7.b.1. Five years or more if active; or

7.7.b.2. Two years or more if closed or at final grade.

7.7.c. To comply with the surface methane operational standard of paragraph 7.5.b.4, the owner or operator shall follow the procedures listed below:

7.7.c.1. Monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at no more than 30 meter intervals (or a site-specific established spacing), after installation and startup of the gas collection system, for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector or other portable monitor that meets the specifications in subdivision 7.7.d;

7.7.c.2. Determine the background concentration 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;

7.7.c.3. Monitor surface emissions during typical meteorological conditions and according to Section 8.3.1 of Method 21 of 40 CFR Part 60, Appendix A and 45CSR16, except that the probe inlet shall be placed within five to ten centimeters of the ground;

7.7.c.4. Record any reading of 500 ppm or more above background at any location as a monitored exceedance and take the actions specified below. If the owner or operator takes the below-specified actions, the Secretary shall not consider the exceedance a violation of the operational requirements of paragraph 7.5.b.4. The owner or operator shall:

7.7.c.4.A. Mark the location of each monitored exceedance and record the location and concentration by determining location using the latitude and longitude coordinates found by an instrument with an accuracy of at least found meters and written in decimal degrees with at least five decimal places;

7.7.c.4.B. Perform cover maintenance or adjust the vacuum of the adjacent wells to increase gas collection in the vicinity of each exceedance and re-monitor the location within ten calendar

days of detecting the exceedance;

7.7.c.4.C. Take additional corrective action if the re-monitoring of the location shows a second exceedance and monitor the location again within ten days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, stop monitoring and take the action specified under subparagraph 7.7.c.4.E;

7.7.c.4.D. Re-monitor one month from the initial exceedance any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the ten-day re-monitoring specified above. If the one month re-monitoring shows a concentration less than 500 ppm above background, then the owner or operator is not required to perform further monitoring of that location until the next quarterly monitoring period. If the one-month re-monitoring shows an exceedance, the owner or operator shall take the actions specified under subparagraphs 7.7.c.4.C or 7.7.c.4.E; and

7.7.c.4.E. For any location where monitored methane concentration equals or exceeds 500 ppm above background three times within a quarterly period, the owner or operator shall install a new well or other collection device within 120 calendar days of the initial exceedance. The owner or operator may submit to the Secretary for approval an alternative solution to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation.

7.7.c.5. Implement a program to monitor cover integrity on a monthly basis and implement cover repairs as necessary.

7.7.d. The owner or operator shall meet the following instrumentation specifications and procedures for surface emission monitoring devices to comply with the provisions in subdivision 7.7.c or paragraph 7.6.a.11:

7.7.d.1. The portable analyzer shall meet the instrument specifications of Section 6 of Method 21 of 40 CFR Part 60, Appendix A and 45CSR16 except that “methane” replaces all references to “VOC”;

7.7.d.2. The calibration gas shall be methane, diluted to a nominal concentration of 500 ppm in air;

7.7.d.3. To meet the performance evaluation requirements in Section 8.1 of Method 21 of 40 CFR Part 60, Appendix A and 45CSR16, use the instrument evaluation procedures of Section 8.1 of Method 21; and

7.7.d.4. Follow the calibration procedures in Sections 8 and 10 of Method 21 of 40 CFR Part 60, Appendix A and 45CSR16 immediately before starting a surface monitoring survey.

#### 7.8. Monitoring requirements.

7.8.a. To comply with paragraph 7.4.b.2 for an active gas collection system, the owner or operator shall install a sampling port and a thermometer, other temperature measuring device or an access port for temperature measurements at each wellhead and:

7.8.a.1. Measure the gauge pressure in the gas collection header monthly per paragraph 7.7.a.3; and

7.8.a.2. Monitor nitrogen or oxygen concentration in the landfill gas monthly as follows:

7.8.a.2.A. Determine the nitrogen level using Method 3C, unless the owner or operator

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establishes an alternative test method as allowed by paragraph 7.9.d.2;

7.8.a.2.B. Determine the oxygen level using an oxygen meter using Method 3A, 3C or ASTM D6522-11 (if sample location is prior to combustion) unless the owner or operator establishes an alternative test method as allowed by paragraph 7.9.d.2, except that:

7.8.a.2.B.1. The span shall be set between ten percent and 12% oxygen;

7.8.a.2.B.2. A data recorder is not required;

7.8.a.2.B.3. Only two calibration gases are required, a zero and span;

7.8.a.2.B.4. A calibration error check is not required; and

7.8.a.2.B.5. The allowable sample bias, zero drift, and calibration drift are plus or minus 10 percent.

7.8.a.2.C. Use a portable gas composition analyzer to monitor the oxygen levels: provided, that:

7.8.a.2.C.1. The analyzer is calibrated; and

7.8.a.2.C.2. The analyzer meets all quality assurance and quality control requirements for Method 3A or ASTM D6522-11.

7.8.a.3. Monitor the temperature of the landfill gas on a monthly basis per paragraph 7.7.a.4, calibrating the temperature measuring device annually using the procedure in Section 10.3 of Method 2 of 40 CFR Part 60, Appendix A-1 and 45CSR16.

7.8.b. If the owner or operator seeks to comply with subdivision 7.4.c using an enclosed combustor, the owner or operator shall calibrate, maintain, and operate the following equipment according to the manufacturer's specifications:

7.8.b.1. A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of plus or minus one percent of the temperature being measured expressed in degrees Celsius or plus or minus 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;

7.8.b.2. For a device that records flow to the control device and bypass of the control device (if applicable), the owner or operator shall:

7.8.b.2.A. Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; and

7.8.b.2.B. Secure the bypass line valve in the closed position with a car-seal or a lock and key type configuration, performing a visual inspection of the seal or closure mechanism at least once every month to ensure that the valve is maintained in the closed position and the gas flow is not diverted through the bypass line.

7.8.c. If the owner or operator chooses to comply with subdivision 7.4.c using a non-enclosed flare, the owner or operator shall install, calibrate, maintain, and operate the following equipment according to the manufacturer's specifications:

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7.8.c.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;

7.8.c.2. For a device that records flow to the flare and bypass of the flare (if applicable), the owner or operator shall:

7.8.c.2.A. Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; and

7.8.c.2.B. Secure the bypass line valve in the closed position with a car-seal or a lock and key type configuration, performing a visual inspection of the seal or closure mechanism 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.

7.8.d. If the owner or operator chooses to comply with subdivision 7.4.c using a device other than a non-enclosed flare or an enclosed combustor or a treatment system, the owner or operator shall provide information per paragraph 7.9.d.2 to the Administrator that describes 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 the owner or operator submit additional information. The Administrator may specify additional appropriate monitoring procedures.

7.8.e. If the owner or operator chooses to install a collection system that does not meet the specifications of subdivision 7.5.a or seeks to monitor alternative parameters to those required by subdivisions 7.5.b, 7.6, 7.7, and 7.8, the owner or operator shall provide information satisfactory to the Administrator as provided in paragraphs 7.9.d.2 and 7.9.d.3 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.

7.8.f. To demonstrate compliance with the 500 ppm surface methane operational standard in paragraph 7.5.b.4, the owner or operator shall monitor surface concentrations of methane according to the requirements of subdivision 7.7.c and the instrument specifications of subdivision 7.7.d. The owner or operator may change to annual monitoring of any closed landfill that does not have monitor exceedances of the operational standard in three consecutive quarterly monitoring periods. If the owner or operator detects any methane reading of 500 ppm or more above background during the annual monitoring, the owner or operator shall resume quarterly monitoring.

7.8.g. To demonstrate compliance with the control system requirements in subdivision 7.4.c using a landfill gas treatment system, the owner or operator shall maintain and operate all monitoring systems associated with the treatment system according to the site-specific treatment system monitoring plan per subparagraph 7.10.b.5.B. The owner or operator shall calibrate, maintain, and operate a device that records flow to the treatment system and bypass of the treatment system, if applicable, according to the manufacturer's specifications by:

7.8.g.1. Installing, calibrating, and maintaining a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and

7.8.g.2. Securing the bypass line valve in the closed position with a car-seal or a lock and key type configuration, performing a visual inspection of the seal or closure mechanism 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.

7.8.h. The monitoring requirements of subdivisions 7.8.b, 7.8.c, 7.8.d, and 7.8.g apply at all times the affected source is operating, except for periods of monitoring system malfunctions, repairs

associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. The owner or operator is required to complete monitoring system repairs in response to monitoring system malfunctions and to return the monitoring system to operation as expeditiously as practicable.

#### 7.9. Reporting requirements.

7.9.a. Design capacity report. -- The owner or operator shall submit the initial design capacity report no later than one year from the effective date of this rule. The initial design capacity report shall contain the following information:

7.9.a.1. 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; and

7.9.a.2. The maximum design capacity of the landfill. If the permit specifies the maximum design capacity, the owner or operator may submit a copy of the permit specifying the maximum design capacity as part of the report. If the permit does not specify the maximum design capacity of the landfill, the owner or operator shall calculate the maximum design capacity using good engineering practices. The owner or operator shall provide the calculations, along with the relevant parameters, as part of the report. The owner or operator may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate the design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation shall include a site-specific density, which the owner or operator shall recalculate annually. The owner or operator shall document any density conversions and submit them with the design capacity report. The Secretary may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.

7.9.b. Amended design capacity report. -- The owner or operator shall submit an amended design capacity report to provide notification of an increase of the landfill maximum design capacity within 90 days of a maximum design capacity that meets or exceeds 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 by subdivision 7.10.f.

7.9.c. NMOC emission rate report. -- For existing MSWLs with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the owner or operator shall submit the NMOC emission rate report per paragraph 7.9.j.2 no later than one year from the effective date of this rule. The owner or operator shall submit the NMOC emission rate report to the Secretary annually per paragraph 7.9.j.2, except as provided for in paragraph 7.9.c.3. The Secretary may request additional information as may be necessary to verify the reported NMOC emission rate. The NMOC emission rate report shall:

7.9.c.1. Contain an annual or five-year estimate of the NMOC emission rate calculated using the formula and procedures in subdivisions 7.6.a or 7.6.b, as applicable; and

7.9.c.2. Include all the data, calculations, sample reports, and measurements used to estimate the annual or five year emissions.

7.9.c.3. The owner or operator may follow the requirements in paragraph 7.9.j.2 and submit an estimate of the NMOC emission rate for the next five-year period in lieu of the annual report if the estimated NMOC emission rate in the annual report is less than 34 megagrams per year in each of five consecutive years. This estimate shall include the current amount of solid waste in place and the

estimated waste acceptance rate for each year of the five years for which an NMOC emission rate is estimated. The owner or operator shall submit to the Secretary all data and calculations upon which it based this estimate. The owner or operator shall revise this estimate at least once every five years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the five year estimate, the owner or operator shall submit to the Secretary a revised five-year estimate, which shall cover the five-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

7.9.c.4. The owner or operator is exempt from the requirement to submit an NMOC emission rate report after it installs a collection and control system that complies with subdivisions 7.4.b and 7.4.c during the time the collection and control system is in operation and complies with subdivision 7.5.b and subsection 7.7.

7.9.d. Collection and control system design plan. -- The owner or operator shall prepare the collection and control system design plan, which shall be approved by a professional engineer and shall meet the following requirements:

7.9.d.1. The collection and control system described in the design plan shall meet the design requirements of subdivisions 7.4.b and 7.4.c.;

7.9.d.2. 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 subdivision 7.5.b and subsections 7.6 through 7.10 proposed by the owner or operator;

7.9.d.3. The collection and control system design plan shall either conform to specifications for active collection systems in subdivision 7.5.a or include a demonstration of sufficiency for the alternative provisions to subdivision 7.5.a that is satisfactory to the Administrator;

7.9.d.4. Each owner or operator of a MSWL having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters shall submit to the Secretary, within one year of the first NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year, a copy of the collection and control system design plan cover page that contains the professional engineer's seal, except as follows:

7.9.d.4.A. If the owner or operator elects to recalculate the NMOC emission rate after the Tier 2 NMOC sampling and analysis in paragraph 7.6.a.9 and the resulting rate is less than 34 megagrams per year, the owner or operator shall resume annual periodic reporting using the Tier 2 determined site-specific NMOC concentration, until the calculated NMOC emission rate is equal to or greater than 34 megagrams per year or the owner or operator closes the landfill. The owner or operator shall submit, per paragraph 7.9.j.2 and within 180 days of the first calculated exceedance of 34 megagrams per year, the revised NMOC emission rate report with the recalculated NMOC emission rate based on NMOC sampling and analysis.

7.9.d.4.B. If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant  $k$ , for Tier 3 per paragraph 7.6.a.9, and the resulting NMOC emission rate is less than 34 megagrams per year, the owner or operator shall resume annual periodic reporting. The owner or operator shall use the resulting site-specific methane generation rate constant  $k$  in the NMOC emission rate calculation until such time as the emissions rate calculation results in an exceedance. The owner or operator shall submit to the Secretary, per paragraph 7.9.j.2 and within one year of the first calculated NMOC emission rate equaling or exceeding 34 megagrams per year, the revised NMOC emission rate report based on the provisions of paragraph 7.6.a.9 and the resulting site specific methane generation rate constant  $k$ .

7.9.d.4.C. If the owner or operator elects to demonstrate that site-specific surface methane emissions are below 500 ppm methane, based on the provisions of paragraph 7.6.a.11, then the owner or operator shall annually submit a Tier 4 surface emissions report per paragraph 7.9.j.2 until the report shows a surface emissions reading of 500 ppm methane or greater. If the Tier 4 surface emissions report shows no surface emissions readings of 500 ppm methane or greater for four consecutive quarters at a closed landfill, then the owner or operator may reduce Tier 4 monitoring from a quarterly to an annual frequency. The Secretary may request additional information that may be necessary to verify the reported instantaneous surface emission readings. The Tier 4 surface emissions report shall clearly identify the location, date and time (to the nearest second), average wind speeds (including wind gusts), and reading (in ppm) of any value 500 ppm methane or greater, other than nonrepeatable, momentary readings. The owner or operator shall determine the latitude and longitude coordinates using an instrument with an accuracy of at least four meters for location, stating the coordinates in decimal degrees with at least five decimal places. The Tier 4 surface emission report shall also include the results of the most recent Tier 1 and Tier 2 results in order to verify that the landfill does not exceed 50 Mg/yr of NMOC.

7.9.d.4.C.1. The owner or operator shall submit the initial annual Tier 4 surface emissions report within 30 days of completing the fourth quarter of Tier 4 surface emissions monitoring that demonstrates that site specific surface methane emissions are below 500 ppm methane and following the procedure specified in paragraph 7.9.j.2 below; and

7.9.d.4.C.2. The owner or operator shall submit the Tier 4 surface emissions rate report within one year of the first measured surface exceedance of 500 ppm methane, following the procedure specified in paragraph 7.9.j.2 below.

7.9.d.4.D. If the landfill is in the closed landfill subcategory, the owner or operator shall submit a collection and control system design plan to the Secretary within one year of the first NMOC emission rate report in which the NMOC emission rate equals or exceeds 50 megagrams per year, except as follows:

7.9.d.4.D.1. If the owner or operator elects to recalculate the NMOC emission rate after the Tier 2 NMOC sampling and analysis under paragraph 7.6.a.7 and the resulting rate is less than 50 megagrams per year, the owner or operator shall resume annual periodic reporting using the Tier 2 determined site-specific NMOC concentration, until the calculated NMOC emission rate is equal to or greater than 50 megagrams per year or the owner or operator closes the landfill. The owner or operator shall submit the revised NMOC emission rate report, with the recalculated NMOC emission rate based on NMOC sampling and analysis, following the procedure specified in paragraph 7.9.j.2, within 180 days of the first calculated exceedance of 50 megagrams per year.

7.9.d.4.D.2. If the owner or operator elects to recalculate the NMOC emission rate after determining a site specific methane generation rate constant  $k$  for Tier 3 under paragraph 7.6.a.9, and the resulting NMOC emission rate is less than 50 megagrams per year, the owner or operator shall resume annual periodic reporting. The owner or operator shall use the resulting site specific methane generation rate constant  $k$  in the NMOC emission rate calculation until the emissions rate calculation results in an exceedance. The owner or operator shall submit the revised NMOC emission rate report per paragraph 7.6.a.9 and the resulting site-specific methane generation rate constant  $k$ , to the Secretary following the procedure specified in paragraph 7.9.j.2 within one year of the first calculated NMOC emission rate equaling or exceeding 50 megagrams per year.

7.9.d.4.D.3. If the owner or operator elects to demonstrate surface emissions are low, consistent with the provisions in subparagraph 7.9.d.4.C; and

7.9.d.4.D.4. The owner or operator has already submitted a gas collection and control system design plan consistent with the provisions of section 4 or section 6 of this rule.

7.9.d.5. The owner or operator shall notify the Secretary that the design plan is completed and submit a copy of the plan's signature page. The Secretary shall decide within 90 days whether the owner or operator should submit the design plan for review. If the Secretary chooses to review the plan, the approval process continues as described in paragraph 7.9.c.6. However, if the Secretary indicates that submission is not required or does not respond within 90 days, the owner or operator may continue to implement the plan with the recognition that it is proceeding at its own risk. If the Secretary requires the owner or operator to modify the design plan in order to obtain approval, the owner or operator shall take any steps necessary to conform any prior actions to the approved design plan, and the owner's or operator's failure to do so may result in an enforcement action by the Secretary.

7.9.d.6. Upon receipt of an initial or revised design plan, the Secretary shall review the information submitted under paragraphs 7.9.d.1 through 7.9.d.3 and either approve it, disapprove it or request that the owner or operator submit additional information. 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. If the Secretary does not approve or disapprove the design plan, or does not request that additional information be submitted within 90 days of receipt, then the owner or operator may continue with implementation of the design plan, recognizing that it will be proceeding at its own risk.

7.9.d.7. If the owner or operator chooses to demonstrate compliance with the emission control requirements using a treatment system, then the owner or operator shall prepare a site-specific treatment system monitoring plan as specified in paragraph 7.10.b.5 below.

7.9.e. Revised design plan. -- If the owner or operator is required to submit a design plan under subdivision 7.9.d or sections 4 or 6, the owner or operator shall submit a revised design plan to the Secretary for approval as follows:

7.9.e.1. At least 90 days before expanding operations to an area not covered by the previously approved design plan; or

7.9.e.2. Prior to installing or expanding the gas collection system in a way that is not consistent with the design plan submitted to the Secretary per subdivision 7.9.d.

7.9.f. Closure report. -- The owner or operator shall submit a closure report to the Secretary within 30 days of ceasing waste acceptance. The Secretary may request additional information as may be necessary to verify that permanent closure has taken place per the requirements of 40 CFR § 258.60. If the owner or operator has submitted a closure report to the Secretary, the owner or operator may not place any additional wastes into the landfill without filing a notification of modification as described under 40 CFR § 60.7(a)(4).

7.9.g. Equipment removal report. -- The owner or operator shall submit an equipment removal report to the Secretary 30 days prior to removal or cessation of operation of the control equipment, which report shall contain the following:

7.9.g.1. A copy of the closure report submitted per subdivision 7.9.f. and:

7.9.g.2. A copy of the initial performance test report demonstrating that the 15-year minimum control period has expired, unless the performance test results report has been submitted to the EPA via the EPA's CDX or information that demonstrates that the gas collection and control system will be unable to operate for 15 years due to declining gas flows; or, in lieu thereof, a report stating the process unit(s) tested, the pollutant(s) tested, and the date that the performance test was conducted, if the owner or operator previously submitted this report to the EPA's CDX; and

7.9.g.3. Dated copies of three successive NMOC emission rate reports demonstrating the landfill is no longer producing 34 megagrams or greater of NMOC per year, unless the owner or operator submitted the NMOC emission rate reports to the EPA via the EPA's CDX; or, in lieu thereof, if the owner or operator has previously submitted the NMOC emission rate reports to the EPA's CDX, a statement that the owner or operator submitted the NMOC emission rate reports electronically, along with the dates that the reports were submitted; or

7.9.g.4. For the closed landfill subcategory, dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year; or, in lieu thereof, a statement that the owner or operator submitted the NMOC emission rate reports electronically to EPA's CDX, along with the dates that the owner or operator electronically submitted the reports.

7.9.g.5. The Secretary may request additional information as may be necessary to verify that the owner or operator has met all of the conditions for removal under subdivision 7.4.f.

7.9.h. Annual report. -- If the owner or operator chooses to comply with paragraph 7.4.e.2 using an active collection system designed per subdivision 7.4.b, the owner or operator shall submit an annual report to the Secretary according to paragraph 7.9.j.2, containing the information listed in paragraphs 7.9.h.1 through 7.9.h.7. The owner or operator shall submit the initial annual report within 180 days of installation and startup of the collection and control system. The initial annual report shall include the initial performance test report required under 40 CFR § 60.8, as applicable, unless the performance test results report has been submitted to the EPA via the EPA's CDX, in which case, the owner or operator may submit, in lieu thereof, a statement that the owner or operator electronically filed the performance test report, the process unit(s) tested, the pollutant(s) tested, and the date that the owner or operator conducted the performance test. The owner or operator shall submit the initial performance test report per paragraph 7.9.j.1 before the date it submits the initial annual report. For enclosed combustion devices and flares, reportable exceedances are defined under paragraph 7.10.c.1. The annual report shall contain:

7.9.h.1. The value and length of time for exceedance of applicable parameters monitored under paragraph 7.8.a.1 and subdivisions 7.8.b, 7.8.c, 7.8.d, and 7.8.g;

7.9.h.2. A description and duration of all periods when the gas stream was diverted from the control device or treatment system through a bypass line or the indication of bypass flow as specified in section 7.8;

7.9.h.3. A 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;

7.9.h.4. All periods when the collection system was not operating;

7.9.h.5. The location of each exceedance of the 500 ppm methane concentration per subdivision 7.5.b.4 and the concentration recorded at each location for which an exceedance was recorded in the previous month, determining the latitude and longitude coordinates using an instrument with an accuracy of at least four meters for the location, which coordinates shall be in decimal degrees with at least five decimal places;

7.9.h.6. The date of installation and the location of each well or collection system expansion added pursuant to 7.7.a.3, 7.7.a.4, 7.7.b, and 7.7.c.4; and

7.9.h.7. For any corrective action analysis for which corrective actions are required by 7.7.a.3 or 7.7.a.4 and that take more than 60 days to correct the exceedance, the root cause analysis conducted, including a description of the recommended corrective action(s), the date for corrective

action(s) already completed following the positive pressure reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

7.9.i. Initial performance test report. -- To comply with subdivision 7.4.c, the owner or operator shall include the following information with the initial performance test report required under 40 CFR § 60.8 and 45CSR16:

7.9.i.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;

7.9.i.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;

7.9.i.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;

7.9.i.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;

7.9.i.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

7.9.i.6. The provisions for the control of off-site migration.

7.9.j. Electronic reporting. -- The owner or operator shall submit reports electronically according to the following:

7.9.j.1. Within 60 days after the date of completing each performance test (as defined in 40 CFR § 60.8), the owner or operator shall submit the results of each performance test according to the following procedures:

7.9.j.1.A. For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT website at the time of the test, the owner or operator shall submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI), which can be accessed through EPA's Central Data Exchange (CDX). The owner or operator shall submit performance test data in a file format generated through the use of the EPA's ERT or an alternative file format consistent with the extensible markup language (XML) schema listed on the EPA's ERT website, once the XML schema is available. If the owner or operator claims that some of the performance test information being submitted is confidential business information (CBI), the owner or operator shall submit a complete file generated through the use of the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website, including information claimed to be CBI, on a compact disc, flash drive or other commonly used electronic storage media to the EPA. The owner or operator shall clearly mark electronic media shall be clearly marked as CBI and mailed to the EPA at the address listed on EPA's ERT website. The owner or operator shall submit the same ERT or alternate file with the CBI omitted to the EPA via the EPA's CDX as described earlier in this subparagraph.

7.9.j.1.B. For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT website at the time of the test, the owner or operator shall submit the results of the performance test to the Administrator at the appropriate address listed in 40 CFR § 60.4.

7.9.j.2. Each owner or operator required to submit reports following the procedure specified in this paragraph shall submit reports to the EPA via the CEDRI, which can be accessed through the EPA's CDX. The owner or operator shall use the appropriate electronic report in CEDRI for this submission or an alternate electronic file format consistent with the XML schema listed on the CEDRI website. If the specific reporting form is not available in CEDRI at the time that the report is due, the owner or operator shall submit the report to the Administrator at the appropriate address listed in 40 CFR § 60.4. Once the form has been available in CEDRI for 90 calendar days, the owner or operator shall submit all subsequent reports via CEDRI. The owner or operator shall submit the reports by the deadlines specified in section 7, regardless of the method of submittal.

7.9.k. Corrective action and the corresponding timeline. -- The owner or operator shall submit the following:

7.9.k.1. For corrective action that is required by subparagraph 7.7.a.3.C or 7.7.a.4.C and that is expected to take longer to complete than 120 days after the initial exceedance, the owner or operator shall submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Secretary as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit) or above. The Secretary shall approve the plan for corrective action and the corresponding timeline.

7.9.k.2. For corrective action that is required by subparagraph 7.7.a.3.C or 7.7.a.4.C and that is not completed within 60 days after the initial exceedance, the owner or operator shall submit a notification to the Secretary as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature exceedance.

7.9.l. Liquids addition. -- The owner or operator of an affected landfill with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters that has employed leachate recirculation or added liquids based on a Research, Development, and Demonstration permit (issued through Resource Conservation and Recovery Act, subtitle D, part 258) within the last ten years shall annually submit to the Secretary, per paragraph 7.9.j.2, the following information:

7.9.l.1. Volume of leachate recirculated (gallons per year) and the reported basis of those estimates (records or engineering estimates);

7.9.l.2. Total volume of all other liquids added (gallons per year) and the reported basis of those estimates (records or engineering estimates);

7.9.l.3. Surface area (acres) over which the leachate is recirculated (or otherwise applied);

7.9.l.4. Surface area (acres) over which any other liquids are applied;

7.9.l.5. The total waste disposed (megagrams) in the areas with recirculated leachate and/or added liquids based on on-site records, to the extent data are available, or engineering estimates and the reported basis of those estimates; and

7.9.l.6. The annual waste acceptance rates (megagrams per year) in the areas with recirculated leachate and/or added liquids based on on-site records, to the extent data are available, or engineering estimates.

7.9.l.7. The initial report shall contain items in paragraphs 7.9.l.1 through 7.9.l.6 on an annual basis for the most recent 365 days, as well as for each of the previous ten years, to the extent historical data are available in on-site records, which report shall be submitted no later than:

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7.9.1.7.A. September 27, 2017 for landfills that commenced construction, modification or reconstruction after July 17, 2014 but before August 29, 2016; or

7.9.1.7.B. One year (365 days) after the date of commenced construction, modification or reconstruction for landfills that commence construction, modification or reconstruction after August 29, 2016.

7.9.1.8. Subsequent annual reports shall contain items in 7.9.1.1 through 7.9.1.6 for the annual (365 days) period following the period included in the previous annual report (365 days), which report shall be submitted no later than 365 days after the date the previous report was submitted.

7.9.1.9. Landfills in the closed landfill subcategory are exempt from the reporting requirements contained in paragraphs 7.9.1.1 through 7.9.1.7.

7.9.1.10. The owner or operator may cease annual reporting of items in paragraphs 7.9.1.1 through 7.9.1.6 after the owner or operator has submitted the closure report per subdivision 7.9.f.

7.9.m. Tier 4 notification.

7.9.m.1. The owner or operator of an affected landfill with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters shall provide a notification of the date(s) the owner or operator intends to demonstrate site specific surface methane emissions are below 500 ppm methane, based on the Tier 4 provisions of paragraph 7.6.a.11. The owner or operator shall also include a description in the notification of the wind barrier to be used during the surface emission monitoring. Notification shall be postmarked not less than 30 days prior to the Tier 4 surface emission monitor date.

7.9.m.2. If there is a delay to the scheduled Tier 4 surface emission monitor date due to weather conditions, including not meeting the wind requirements of part 7.6.a.11.E.1, the owner or operator shall notify the Secretary by email or telephone no later than 48 hours before any known delay in the original test date and arrange with the Secretary a mutually agreeable new test date.

7.10. Recordkeeping requirements.

7.10.a. Except as provided in paragraph 7.9.d.2, each owner or operator of an MSWL subject to the provisions of subdivision 7.4.e shall keep on-site records of the design capacity report that triggered subdivision 7.4.f, the current amount of solid waste in place, and the year-by-year waste acceptance rate for at least five years up-to-date, readily accessible. The owner or operator may maintain off-site records if they are retrievable within four hours. Either paper copy or electronic formats are acceptable.

7.10.b. Except as provided in paragraph 7.9.d.2, the owner or operator shall keep up-to-date, readily accessible records of the data listed in paragraphs 7.10.b.1 through 7.10.b.5 below, as measured during the initial performance test or compliance determination, for the life of the control system equipment. The owner or operator shall maintain records of subsequent tests or monitoring for a minimum of five years and records of the control device vendor specifications the control device is removed.

7.10.b.1. To demonstrate compliance with the collection system requirements of subdivision 7.4.b, the owner or operator shall keep a record of:

7.10.b.1.A. The maximum expected gas generation flow rate as calculated in paragraph 7.7.a.1. If the Administrator approved another method to determine the maximum gas generation flow rate, the owner or operator may use the other method; and

7.10.b.1.B. The density of wells, horizontal collectors, surface collectors or other gas

extraction devices determined per subparagraph 7.5.a.1.A.

7.10.b.2. To demonstrate compliance with the control system requirements of subdivision 7.4.c through the 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, the owner or operator shall keep a record of:

7.10.b.2.A. The average temperature measured at least every 15 minutes and averaged over the same time period of the performance test; and

7.10.b.2.B. The percent reduction of NMOC achieved by the control device determined per paragraph 7.4.c.2.

7.10.b.3. To demonstrate compliance with paragraph 7.4.c.1 through the use of a non-enclosed flare, the owner or operator shall keep a record of the flare type (i.e., steam assisted, air-assisted or non-assisted), 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 40 CFR § 60.18, as well as continuous records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame or the flare flame is absent.

7.10.b.4. To demonstrate compliance with subparagraph 7.4.c.2.A through the use of a boiler or process heater of any size the owner or operator shall keep a record including a description of the location where the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing.

7.10.b.5. To demonstrate compliance with paragraph 7.4.c.3 through the use of a landfill gas treatment system the owner or operator shall keep:

7.10.b.5.A. Bypass records. -- Records of the flow of landfill gas to, and bypass of, the treatment system; and

7.10.b.5.B. A site specific treatment monitoring plan, to include:

7.10.b.5.B.1. Monitoring records of parameters identified in the treatment system monitoring plan and that ensure the treatment system is operating properly for each intended end use of the treated landfill gas. At a minimum, the owner or operator shall include records of filtration, dewatering, and compression parameters that ensure the treatment system is operating properly for each intended end use of the treated landfill gas;

7.10.b.5.B.2. Monitoring methods, frequencies, and operating ranges for each monitored operating parameter based on manufacturer's recommendations or engineering analysis for each intended end use of the treated landfill gas;

7.10.b.5.B.3. Documentation of the monitoring methods and ranges, along with justification for their use;

7.10.b.5.B.4. Identification of who is responsible (by job title) for data collection;

7.10.b.5.B.5. Documentation of processes and methods used to collect the necessary data; and

7.10.b.5.B.6. Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems.

7.10.c. Except as provided in paragraph 7.9.d.2, the owner or operator shall keep for five years

up-to-date, readily accessible, continuous records of the equipment operating parameters required by section 7.8, 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.

7.10.c.1. The following constitute exceedances that the owner or operator shall record and report under section 7.9:

7.10.c.1.A. For enclosed combustors, except for boilers and process heaters with design heat input capacity greater than 44 megawatts (150 million British thermal unit per hour), all three-hour periods of operation that the average temperature was more than 28 degrees Celsius (82 degrees Fahrenheit) below the average combustion temperature that the owner or operator determined compliance with subdivision 7.4.c during the most recent performance test; and

7.10.c.1.B. For boilers or process heaters, whenever there is a change in the location where the vent stream is introduced into the flame zone per paragraph 7.10.b.3.

7.10.c.2. The owner or operator 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, per section 7.8.

7.10.c.3. If the owner or operator uses a boiler or process heater with a design heat input capacity greater than 44 megawatts to comply with subdivision 7.4.c, the owner or operator shall keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater (e.g. records of steam use, fuel use or monitoring data collected pursuant to other State, local, tribal or federal regulatory requirements).

7.10.c.4. Each owner or operator seeking to comply with the provisions of section 7 by use of a non-enclosed flare shall keep up-to-date, readily accessible, continuous records of the flame or flare pilot flame monitoring required by subdivision 7.8.c, and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

7.10.c.5. Each owner or operator seeking to comply with subdivision 7.4.e using an active collection system designed per subdivision 7.4.b, shall keep records of periods when the collection system or control device is not operating.

7.10.d. The owner or operator shall keep an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label on each collector that matches the labeling on the plot map for the life of the collection system, except as provided in paragraph 7.9.d.2. below. The owner or operator shall keep:

7.10.d.1. Up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under subdivision 7.7.b.; and

7.10.d.2. Readily accessible documentation of the nature, date of deposition, amount, and location of asbestos containing or nondegradable waste excluded from collection under part 7.5.a.1.C.1 and any nonproductive areas excluded from collection under part 7.5.a.1.C.2.

7.10.e. The owner or operator shall keep up-to-date, readily accessible records of the following, except as provided in paragraph 7.9.d.2, for a minimum of five years:

7.10.e.1. All collection and control system exceedances of the operational standards in subdivision 7.5.b, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance;

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7.10.e.2. Each wellhead temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit) or above, each wellhead nitrogen level at or above 20%, and each wellhead oxygen level at or above five percent;

7.10.e.3. The root cause analysis conducted, including a description of the recommended corrective action(s) taken and the date(s) the corrective action(s) were completed, for which corrective actions are required by paragraphs 7.7.a.3 or 7.7.a.4;

7.10.e.4. The root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates, for which corrective actions are required by subparagraphs 7.7.a.3.B or 7.7.a.4.B; and

7.10.e.5. The root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates, and a copy of any comments or final approval on the corrective action analysis or schedule from the Secretary for any root cause analysis for which corrective actions are required by subparagraphs 7.7.a.3.C or 7.7.4.C.

7.10.f. Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that the landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters shall keep readily accessible, on-site records of the annual recalculation of site specific density, design capacity, and the supporting documentation. The owner or operator may maintain records off site if they are retrievable within four hours. Either paper copy or electronic formats are acceptable.

7.10.g. To demonstrate that site-specific surface methane emissions are below 500 ppm by conducting surface emission monitoring under the Tier 4 procedures specified in paragraph 7.6.a.11, the owner or operator shall keep for a minimum of five years up-to-date, readily accessible records of all surface emissions monitoring and information related to monitoring instrument calibrations conducted per Sections 8 and 10 of 40 CFR Part 60, Appendix A and 45CSR16 including all of the following items:

7.10.g.1. Calibration records:

7.10.g.1.A. Date of calibration and initials of operator performing the calibration;

7.10.g.1.B. Calibration gas cylinder identification, certification date, and certified concentration;

7.10.g.1.C. Instrument scale(s) used;

7.10.g.1.D. A description of any corrective action taken if the meter readout could not be adjusted to correspond to the calibration gas value; and

7.10.g.1.E. If the owner or operator makes its own calibration gas, a description of the procedure used.

7.10.g.2. Digital photographs of the instrument setup. -- For the duration of the Tier 4 monitoring demonstration, the owner or operator shall take time and date stamped digital photographs prior to sampling at the first sampling location and at the last sampling location after sampling at the end of each sampling day;

7.10.g.3. Time stamp of each surface scan reading:

7.10.g.3.A. The time stamp should be detailed to the nearest second, based on when the sample collection begins; and

7.10.g.3.B. A log for the length of time each sample was taken using a stopwatch (e.g., the time the probe was held over the area).

7.10.g.4. Location of each surface scan reading. – The owner or operator shall determine the coordinates using an instrument with an accuracy of at least four meters, which coordinates shall be in decimal degrees with at least five decimal places;

7.10.g.5. Monitored methane concentration (ppm) of each reading;

7.10.g.6. Background methane concentration (ppm) after each instrument calibration test;

7.10.g.7. Adjusted methane concentration using most recent calibration (ppm);

7.10.g.8. For readings taken at each surface penetration, the unique identification location label matching the label specified in subdivision 7.10.d; and

7.10.g.9. Records of the operating hours of the gas collection system for each destruction device.

7.10.h. The owner or operator shall keep up-to-date, readily accessible records of all collection and control system monitoring data for parameters measured in paragraphs 7.8.a.1, 7.8.a.2, and 7.8.a.3 for a minimum of five years, except as provided in paragraph 7.9.d.2.

7.10.i. The owner or operator may maintain in electronic format any documents required to be maintained by section 7 that it submitted electronically via EPA's CDX.

7.10.j. If the owner or operator reports leachate or other liquids addition under subdivision 7.9.l, the owner or operator shall keep records of any engineering calculations or company records used to estimate the quantities of leachate or liquids added, the surface areas for which the leachate or liquids were applied, and the estimates of annual waste acceptance or total waste in place in the areas where the owner or operator applied leachate or liquids.

**§45-23-8. Secretary.**

8.1. All references in 40 CFR Part 60 Subparts Cf and XXX to the "Administrator" are amended to be the "Secretary" except in the following references, which shall remain "Administrator":

8.1.a. Where the Federal Regulations specifically provide that the Administrator shall retain authority and not transfer such authority to the Secretary;

8.1.b. Where provisions occur which refer to:

8.1.b.1. Alternate means of emission limitations;

8.1.b.2. Alternate control technologies;

8.1.b.3. Innovative technology waivers;

8.1.b.4. Alternate test methods;

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8.1.b.5. Alternate monitoring methods;

8.1.b.6. Waivers/adjustments to recordkeeping and reporting;

8.1.b.7. Applicability determinations; or

8.1.b.8. The requirements of 40 CFR § 60.764(a)(5) to approve other methods to determine the NMOC concentration or a site specific methane generation rate constant as an alternative to the methods required by 40 CFR § 60.764(a)(3) and (4); and

8.1.c. Where the context of the regulation clearly requires otherwise.

### **§45-23-9. Inconsistency Between Rules.**

9.1. In the event of any inconsistency between this rule and any other rule of the Division of Air Quality, the inconsistency shall be resolved by the determination of the Secretary, and the determination shall be based upon the application of the more stringent provision, term, condition, method or rule.