

West Virginia Department of Environmental Protection

Harold D. Ward

Cabinet Secretary

Permit to Operate



Pursuant to

Title V

of the Clean Air Act

Issued to:

Mercer County Solid Waste Authority

Mercer County Sanitary Landfill

R30-05500123-2024

Laura M. Crowder

Director, Division of Air Quality

Expiration: [Date of issuance] • Effective: [Equals issue date plus two weeks]
Renewal Application Due: [6 months prior to expiration]

Permit Number: **R30-05500123-2024**
Permittee: **Mercer County Solid Waste Authority**
Facility Name: **Mercer County Sanitary Landfill**
Permittee Mailing Address: **749 Frontage Road, Princeton, WV 24739**

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45CSR30 — Requirements for Operating Permits. The permittee identified at the above-referenced facility is authorized to operate the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Facility Location:	Princeton, Mercer County, West Virginia
Telephone Number:	304-425-3366
Type of Business Entity:	Governmental Agency
Facility Description:	Municipal Solid Waste Landfill
SIC Codes:	4953
UTM Coordinates:	488.9 km Easting • 4131.4 km Northing • Zone 17

Permit Writer: Nikki B. Moats

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.

Issuance of this Title V Operating Permit does not supersede or invalidate any existing permits under 45CSR13, 14 or 19, although all applicable requirements from such permits governing the facility's operation and compliance have been incorporated into the Title V Operating Permit.

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1.0 Emission Units and Active R13, R14, and R19 Permits

1.1 Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
E001	E001	Landfill Solid Waste	1979	2,794,000 Mg	None
T-1	T-1	Diesel Fuel Tank	1979	2000 gal	None
T-2	T-2	Diesel Fuel Tank	2019	700 gal	None
T-3	T-3	Diesel Fuel Tank	2008	350 gal	None
T-4	T-4	Gasoline Tank	2000	500 gal	None
T-5	T-5	Leachate Tank	1992	554,020 gal	None

1.2 Active R13, R14, and R19 Permits

The underlying authority for any conditions from R13, R14, and/or R19 permits contained in this operating permit is cited using the original permit number (e.g. R13-1234). The current applicable version of such permit(s) is listed below.

Permit Number	Date of Issuance
N/A	N/A

2.0 General Conditions

2.1 Definitions

- 2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.
- 2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.
- 2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.39.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.
- 2.1.4. Unless otherwise specified in a permit condition or underlying rule or regulation, all references to a "rolling yearly total" shall mean the sum of the monthly data, values or parameters being measured, monitored, or recorded, at any given time for the previous twelve (12) consecutive calendar months.

2.2 Acronyms

CAAA	Clean Air Act Amendments	NSPS	New Source Performance Standards
CBI	Confidential Business Information	PM	Particulate Matter
CEM	Continuous Emission Monitor	PM₁₀	Particulate Matter less than 10µm in diameter
CES	Certified Emission Statement	pph	Pounds per Hour
C.F.R. or CFR	Code of Federal Regulations	ppm	Parts per Million
CO	Carbon Monoxide	PSD	Prevention of Significant Deterioration
C.S.R. or CSR	Codes of State Rules	psi	Pounds per Square Inch
DAQ	Division of Air Quality	SIC	Standard Industrial Classification
DEP	Department of Environmental Protection	SIP	State Implementation Plan
FOIA	Freedom of Information Act	SO₂	Sulfur Dioxide
HAP	Hazardous Air Pollutant	TAP	Toxic Air Pollutant
HON	Hazardous Organic NESHAP	TPY	Tons per Year
HP	Horsepower	TRS	Total Reduced Sulfur
lbs/hr or lb/hr	Pounds per Hour	TSP	Total Suspended Particulate
LDAR	Leak Detection and Repair	USEPA	United States Environmental Protection Agency
m	Thousand	UTM	Universal Transverse Mercator
MACT	Maximum Achievable Control Technology	VEE	Visual Emissions Evaluation
mm	Million	VOC	Volatile Organic Compounds
mmBtu/hr	Million British Thermal Units per Hour		
mmft³/hr or mmcf/hr	Million Cubic Feet Burned per Hour		
NA or N/A	Not Applicable		
NAAQS	National Ambient Air Quality Standards		
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		
NO_x	Nitrogen Oxides		

2.3. Permit Expiration and Renewal

- 2.3.1. Permit duration. This permit is issued for a fixed term of five (5) years and shall expire on the date specified on the cover of this permit, except as provided in 45CSR§30-6.3.b. and 45CSR§30-6.3.c.
[45CSR§30-5.1.b.]
- 2.3.2. A permit renewal application is timely if it is submitted at least six (6) months prior to the date of permit expiration.
[45CSR§30-4.1.a.3.]
- 2.3.3. Permit expiration terminates the source's right to operate unless a timely and complete renewal application has been submitted consistent with 45CSR§30-6.2. and 45CSR§30-4.1.a.3.
[45CSR§30-6.3.b.]
- 2.3.4. If the Secretary fails to take final action to deny or approve a timely and complete permit application before the end of the term of the previous permit, the permit shall not expire until the renewal permit has been issued or denied, and any permit shield granted for the permit shall continue in effect during that time.
[45CSR§30-6.3.c.]

2.4. Permit Actions

- 2.4.1. This permit may be modified, revoked, reopened and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.
[45CSR§30-5.1.f.3.]

2.5. Reopening for Cause

- 2.5.1. This permit shall be reopened and revised under any of the following circumstances:
- a. Additional applicable requirements under the Clean Air Act or the Secretary's legislative rules become applicable to a major source with a remaining permit term of three (3) or more years. Such a reopening shall be completed not later than eighteen (18) months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions has been extended pursuant to 45CSR§§30-6.6.a.1.A. or B.
 - b. Additional requirements (including excess emissions requirements) become applicable to an affected source under Title IV of the Clean Air Act (Acid Deposition Control) or other legislative rules of the Secretary. Upon approval by U.S. EPA, excess emissions offset plans shall be incorporated into the permit.
 - c. The Secretary or U.S. EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.
 - d. The Secretary or U.S. EPA determines that the permit must be revised or revoked and reissued to assure compliance with the applicable requirements.

[45CSR§30-6.6.a.]

2.6. Administrative Permit Amendments

- 2.6.1. The permittee may request an administrative permit amendment as defined in and according to the procedures specified in 45CSR§30-6.4.
[45CSR§30-6.4.]

2.7. Minor Permit Modifications

- 2.7.1. The permittee may request a minor permit modification as defined in and according to the procedures specified in 45CSR§30-6.5.a.
[45CSR§30-6.5.a.]

2.8. Significant Permit Modification

- 2.8.1. The permittee may request a significant permit modification, in accordance with 45CSR§30-6.5.b., for permit modifications that do not qualify for minor permit modifications or as administrative amendments.
[45CSR§30-6.5.b.]

2.9. Emissions Trading

- 2.9.1. No permit revision shall be required, under any approved economic incentives, marketable permits, emissions trading, and other similar programs or processes for changes that are provided for in the permit and that are in accordance with all applicable requirements.
[45CSR§30-5.1.h.]

2.10. Off-Permit Changes

- 2.10.1. Except as provided below, a facility may make any change in its operations or emissions that is not addressed nor prohibited in its permit and which is not considered to be construction nor modification under any rule promulgated by the Secretary without obtaining an amendment or modification of its permit. Such changes shall be subject to the following requirements and restrictions:
- a. The change must meet all applicable requirements and may not violate any existing permit term or condition.
 - b. The permittee must provide a written notice of the change to the Secretary and to U.S. EPA within two (2) business days following the date of the change. Such written notice shall describe each such change, including the date, any change in emissions, pollutants emitted, and any applicable requirement that would apply as a result of the change.
 - c. The change shall not qualify for the permit shield.
 - d. The permittee shall keep records describing all changes made at the source that result in emissions of regulated air pollutants, but not otherwise regulated under the permit, and the emissions resulting from those changes.
 - e. No permittee may make any change subject to any requirement under Title IV of the Clean Air Act (Acid Deposition Control) pursuant to the provisions of 45CSR§30-5.9.

- f. No permittee may make any changes which would require preconstruction review under any provision of Title I of the Clean Air Act (including 45CSR14 and 45CSR19) pursuant to the provisions of 45CSR§30-5.9.

[45CSR§30-5.9.]

2.11. Operational Flexibility

- 2.11.1. The permittee may make changes within the facility as provided by § 502(b)(10) of the Clean Air Act. Such operational flexibility shall be provided in the permit in conformance with the permit application and applicable requirements. No such changes shall be a modification under any rule or any provision of Title I of the Clean Air Act (including 45CSR14 and 45CSR19) promulgated by the Secretary in accordance with Title I of the Clean Air Act and the change shall not result in a level of emissions exceeding the emissions allowable under the permit.

[45CSR§30-5.8]

- 2.11.2. Before making a change under 45CSR§30-5.8., the permittee shall provide advance written notice to the Secretary and to U.S. EPA, describing the change to be made, the date on which the change will occur, any changes in emissions, and any permit terms and conditions that are affected. The permittee shall thereafter maintain a copy of the notice with the permit, and the Secretary shall place a copy with the permit in the public file. The written notice shall be provided to the Secretary and U.S. EPA at least seven (7) days prior to the date that the change is to be made, except that this period may be shortened or eliminated as necessary for a change that must be implemented more quickly to address unanticipated conditions posing a significant health, safety, or environmental hazard. If less than seven (7) days notice is provided because of a need to respond more quickly to such unanticipated conditions, the permittee shall provide notice to the Secretary and U.S. EPA as soon as possible after learning of the need to make the change.

[45CSR§30-5.8.a.]

- 2.11.3. The permit shield shall not apply to changes made under 45CSR§30-5.8., except those provided for in 45CSR§30-5.8.d. However, the protection of the permit shield will continue to apply to operations and emissions that are not affected by the change, provided that the permittee complies with the terms and conditions of the permit applicable to such operations and emissions. The permit shield may be reinstated for emissions and operations affected by the change:

- a. If subsequent changes cause the facility's operations and emissions to revert to those authorized in the permit and the permittee resumes compliance with the terms and conditions of the permit, or
- b. If the permittee obtains final approval of a significant modification to the permit to incorporate the change in the permit.

[45CSR§30-5.8.c.]

- 2.11.4. "Section 502(b)(10) changes" are changes that contravene an express permit term. Such changes do not include changes that would violate applicable requirements or contravene enforceable permit terms and conditions that are monitoring (including test methods), recordkeeping, reporting, or compliance certification requirements.

[45CSR§30-2.40]

2.12. Reasonably Anticipated Operating Scenarios

- 2.12.1. The following are terms and conditions for reasonably anticipated operating scenarios identified in this permit.
- a. Contemporaneously with making a change from one operating scenario to another, the permittee shall record in a log at the permitted facility a record of the scenario under which it is operating and to document the change in reports submitted pursuant to the terms of this permit and 45CSR30.
 - b. The permit shield shall extend to all terms and conditions under each such operating scenario; and
 - c. The terms and conditions of each such alternative scenario shall meet all applicable requirements and the requirements of 45CSR30.

[45CSR§30-5.1.i.]

2.13. Duty to Comply

- 2.13.1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

[45CSR§30-5.1.f.1.]

2.14. Inspection and Entry

- 2.14.1. The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:
- a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 - c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;
 - d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

[45CSR§30-5.3.b.]

2.15. Schedule of Compliance

- 2.15.1. For sources subject to a compliance schedule, certified progress reports shall be submitted consistent with the applicable schedule of compliance set forth in this permit and 45CSR§30-4.3.h., but at least every six (6) months, and no greater than once a month, and shall include the following:
- a. Dates for achieving the activities, milestones, or compliance required in the schedule of compliance, and dates when such activities, milestones or compliance were achieved; and
 - b. An explanation of why any dates in the schedule of compliance were not or will not be met, and any preventative or corrective measure adopted.

[45CSR§30-5.3.d.]

2.16. Need to Halt or Reduce Activity not a Defense

- 2.16.1. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

[45CSR§30-5.1.f.2.]

2.17. Reserved

2.18. Federally-Enforceable Requirements

- 2.18.1. All terms and conditions in this permit, including any provisions designed to limit a source's potential to emit and excepting those provisions that are specifically designated in the permit as "State-enforceable only", are enforceable by the Secretary, USEPA, and citizens under the Clean Air Act.

[45CSR§30-5.2.a.]

- 2.18.2. Those provisions specifically designated in the permit as "State-enforceable only" shall become "Federally-enforceable" requirements upon SIP approval by the USEPA.

2.19. Duty to Provide Information

- 2.19.1. The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records required to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

[45CSR§30-5.1.f.5.]

2.20. Duty to Supplement and Correct Information

- 2.20.1. Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

[45CSR§30-4.2.]

2.21. Permit Shield

- 2.21.1. Compliance with the conditions of this permit shall be deemed compliance with any applicable requirements as of the date of permit issuance provided that such applicable requirements are included and are specifically identified in this permit or the Secretary has determined that other requirements specifically identified are not applicable to the source and this permit includes such a determination or a concise summary thereof.

[45CSR§30-5.6.a.]

- 2.21.2. Nothing in this permit shall alter or affect the following:

- a. The liability of an owner or operator of a source for any violation of applicable requirements prior to or at the time of permit issuance; or
- b. The applicable requirements of the Code of West Virginia and Title IV of the Clean Air Act (Acid Deposition Control), consistent with § 408 (a) of the Clean Air Act.
- c. The authority of the Administrator of U.S. EPA to require information under § 114 of the Clean Air Act or to issue emergency orders under § 303 of the Clean Air Act.

[45CSR§30-5.6.c.]

2.22. Credible Evidence

- 2.22.1. Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defenses otherwise available to the permittee including but not limited to any challenge to the credible evidence rule in the context of any future proceeding.

[45CSR§30-5.3.e.3.B.]

2.23. Severability

- 2.23.1. The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid by a court of competent jurisdiction, the remaining permit terms and conditions or their application to other circumstances shall remain in full force and effect.

[45CSR§30-5.1.e.]

2.24. Property Rights

- 2.24.1. This permit does not convey any property rights of any sort or any exclusive privilege.

[45CSR§30-5.1.f.4]

2.25. Acid Deposition Control

- 2.25.1. Emissions shall not exceed any allowances that the source lawfully holds under Title IV of the Clean Air Act (Acid Deposition Control) or rules of the Secretary promulgated thereunder.
- a. No permit revision shall be required for increases in emissions that are authorized by allowances acquired pursuant to the acid deposition control program, provided that such increases do not require a permit revision under any other applicable requirement.
 - b. No limit shall be placed on the number of allowances held by the source. The source may not, however, use allowances as a defense to noncompliance with any other applicable requirement.
 - c. Any such allowance shall be accounted for according to the procedures established in rules promulgated under Title IV of the Clean Air Act.

[45CSR§30-5.1.d.]

- 2.25.2. Where applicable requirements of the Clean Air Act are more stringent than any applicable requirement of regulations promulgated under Title IV of the Clean Air Act (Acid Deposition Control), both provisions shall be incorporated into the permit and shall be enforceable by the Secretary and U. S. EPA.

[45CSR§30-5.1.a.2.]

3.0 Facility-Wide Requirements

3.1 Limitations and Standards

- 3.1.1. **Open burning.** The open burning of refuse by any person is prohibited except as noted in 45CSR§6-3.1. [45CSR§6-3.1.]
- 3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause or allow any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible. [45CSR§6-3.2.]
- 3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them. [40 C.F.R. §61.145(b) and 45CSR34]
- 3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. [45CSR§4-3.1 State-Enforceable only.]
- 3.1.5. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11. [45CSR§11-5.2]
- 3.1.6. **Emission inventory.** The permittee is responsible for submitting, on an annual basis, an emission inventory in accordance with the submittal requirements of the Division of Air Quality. [W.Va. Code § 22-5-4(a)(14)]
- 3.1.7. **Ozone-depleting substances.** For those facilities performing maintenance, service, repair or disposal of appliances, the permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 C.F.R. Part 82, Subpart F, except as provided for Motor Vehicle Air Conditioners (MVACs) in Subpart B:
- a. Persons opening appliances for maintenance, service, repair, or disposal must comply with the prohibitions and required practices pursuant to 40 C.F.R. §§ 82.154 and 82.156.
 - b. Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to 40 C.F.R. § 82.158.

- c. Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to 40 C.F.R. § 82.161.

[40 C.F.R. 82, Subpart F]

- 3.1.8. **Risk Management Plan.** This stationary source, as defined in 40 C.F.R. § 68.3, is subject to Part 68. This stationary source shall submit a risk management plan (RMP) by the date specified in 40 C.F.R. Part 68.10. This stationary source shall certify compliance with the requirements of Part 68 as part of the annual compliance certification as required by 40 C.F.R. Part 70 or 71.

[40 C.F.R. 68]

- 3.1.9. No person shall cause, suffer, allow, or permit fugitive particulate matter to be discharged beyond the boundary lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.

[45CSR§17-3.1 State-Enforceable only.]

- 3.1.10. The permittee shall submit a control program upon the request of the Secretary, when the permitted facility is in violation of rule 45CSR17. The Secretary may require the permittee to utilize a system to minimize fugitive particulate matter that may include, but is not limited to, the following:

- a) Use, where practical, of water or chemicals for control of particulate matter in demolition of existing buildings or structures, construction operations, grading of roads or the clearing of land;
- b) Application of asphalt, water or suitable chemicals on unpaved roads, material stockpiles and other surfaces which can create airborne particulate matter;
- c) Covering of material transport vehicles, or treatment of cargo, to prevent contents from dripping, sifting, leaking or otherwise escaping and becoming airborne, and prompt removal of tracked material from roads or streets; or
- d) Installation and use of hoods, fans and fabric filters to enclose and vent the handling of materials including adequate containment methods during sandblasting, abrasive cleaning or other similar operations.

[45CSR§§17-3.2 & 4.1 State-Enforceable only.]

3.2. Monitoring Requirements

- 3.2.1. None.

3.3. Testing Requirements

- 3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted

in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

- a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63, if applicable, in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable.
- b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit.
- c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.
- d. The permittee shall submit a report of the results of the stack test within 60 days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:
 1. The permit or rule evaluated, with the citation number and language.
 2. The result of the test for each permit or rule condition.
 3. A statement of compliance or non-compliance with each permit or rule condition.

[WV Code §§ 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

- 3.4.1. **Monitoring information.** The permittee shall keep records of monitoring information that include the following:
 - a. The date, place as defined in this permit and time of sampling or measurements;
 - b. The date(s) analyses were performed;
 - c. The company or entity that performed the analyses;

- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

[45CSR§30-5.1.c.2.A.]

- 3.4.2. **Retention of records.** The permittee shall retain records of all required monitoring data and support information for a period of at least five (5) years from the date of monitoring sample, measurement, report, application, or record creation date. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Where appropriate, records may be maintained in computerized form in lieu of the above records.

[45CSR§30-5.1.c.2.B.]

- 3.4.3. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.

[45CSR§30-5.1.c. State-Enforceable only.]

3.5. Reporting Requirements

- 3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.

[45CSR§§30-4.4. and 5.1.c.3.D.]

- 3.5.2. A permittee may request confidential treatment for the submission of reporting required under 45CSR§30-5.1.c.3. pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.

[45CSR§30-5.1.c.3.E.]

- 3.5.3. Except for the electronic submittal of the annual compliance certification and semi-annual monitoring reports to the DAQ and USEPA as required in 3.5.5 and 3.5.6 below, all notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class or by private carrier with postage prepaid to the address(es), or submitted in electronic format by e-mail as set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street SE
Charleston, WV 25304

US EPA:

Section Chief
U. S. Environmental Protection Agency, Region III
Enforcement and Compliance Assurance Division
Air, RCRA and Toxics Branch (3ED21)
Four Penn Center

1600 John F. Kennedy Boulevard
Philadelphia, PA 19103-2852

DAQ Compliance and Enforcement¹:

DEPAirQualityReports@wv.gov

¹For all self-monitoring reports (MACT, GACT, NSPS, etc.), stack tests and protocols, Notice of Compliance Status reports, Initial Notifications, etc.

3.5.4. **Fees.** The permittee shall pay fees on an annual basis in accordance with 45CSR§30-8.
[45CSR§30-8.]

3.5.5. **Compliance certification.** The permittee shall certify compliance with the conditions of this permit on the forms provided by the DAQ. In addition to the annual compliance certification, the permittee may be required to submit certifications more frequently under an applicable requirement of this permit. The annual certification shall be submitted to the DAQ and USEPA on or before March 15 of each year, and shall certify compliance for the period ending December 31. The permittee shall maintain a copy of the certification on site for five (5) years from submittal of the certification. The annual certification shall be submitted in electronic format by e-mail to the following addresses:

DAQ:
DEPAirQualityReports@wv.gov

US EPA:
R3_APD_Permits@epa.gov

[45CSR§30-5.3.e.]

3.5.6. **Semi-annual monitoring reports.** The permittee shall submit reports of any required monitoring on or before September 15 for the reporting period January 1 to June 30 and on or before March 15 for the reporting period July 1 to December 31. All instances of deviation from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official consistent with 45CSR§30-4.4. The semi-annual monitoring reports shall be submitted in electronic format by e-mail to the following address:

DAQ:
DEPAirQualityReports@wv.gov

[45CSR§30-5.1.c.3.A.]

3.5.7. **Reserved.**

3.5.8. **Deviations.**

a. In addition to monitoring reports required by this permit, the permittee shall promptly submit supplemental reports and notices in accordance with the following:

1. Reserved.

2. Any deviation that poses an imminent and substantial danger to public health, safety, or the environment shall be reported to the Secretary immediately by telephone or email. A written report of such deviation, which shall include the probable cause of such deviation, and any corrective

actions or preventative measures taken, shall be submitted by the responsible official within ten (10) days of the deviation.

3. Deviations for which more frequent reporting is required under this permit shall be reported on the more frequent basis.
4. All reports of deviations shall identify the probable cause of the deviation and any corrective actions or preventative measures taken.

[45CSR§30-5.1.c.3.C.]

- b. The permittee shall, in the reporting of deviations from permit requirements, including those attributable to upset conditions as defined in this permit, report the probable cause of such deviations and any corrective actions or preventive measures taken in accordance with any rules of the Secretary.

[45CSR§30-5.1.c.3.B.]

- 3.5.9. **New applicable requirements.** If any applicable requirement is promulgated during the term of this permit, the permittee will meet such requirements on a timely basis, or in accordance with a more detailed schedule if required by the applicable requirement.

[45CSR§30-4.3.h.1.B.]

3.6. Compliance Plan

- 3.6.1. None.

3.7. Permit Shield

- 3.7.1. The permittee is hereby granted a permit shield in accordance with 45CSR§30-5.6. The permit shield applies provided the permittee operates in accordance with the information contained within this permit.
- 3.7.2. The following requirements specifically identified are not applicable to the source based on the determinations set forth below. The permit shield shall apply to the following requirements provided the conditions of the determinations are met.

40 C.F.R. 60 Subpart Kb	The Leachate Tank's VOL vapor pressure is less than 3.5 kPa.
40 C.F.R. Part 64 Compliance Assurance Monitoring (CAM)	The facility does not have any pollutant specific emissions units (PSEU) that satisfy all of the applicability criteria requirements of 40 CFR §64.2(a). [i.e., (1) have pre-control regulated pollutant potential emissions (PTE) equal to or greater than the "major" threshold limits to be classified as a major source; 2) are subject to an emission limitation or standard and; 3) have a control device to achieve compliance with such emission limitation or standard.] Therefore, the facility is not subject to the Compliance Assurance Monitoring (CAM) rule.

4.0 Solid Waste Landfill [emission point ID: E001]

4.1. Limitations and Standards

- 4.1.1. 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:
- a. The landfill accepted waste at any time after November 8, 1987, or the MSWL has additional design capacity available for future waste deposition;
 - b. The landfill commenced construction, reconstruction or modification before July 17, 2014;
 - c. 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
 - d. The landfill is in the closed landfill subcategory and has 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.
[45CSR§23-7.4.a]
- 4.1.2. Collection System – For each MSWL that meets the criteria under condition 4.1.1, the gas collection and control system installation shall meet the requirements under paragraphs 4.1.2 through 4.1.3.
- a. 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:
 1. 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 condition 7.9.d.4 of 45CSR23; or
 2. 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 condition 7.9.d.4 of 45CSR23; or
 3. 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 condition 7.9.d.4.C of 45CSR23.
 - b. An active collection system shall:
 1. Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment;
 2. Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of five years or more if active or two years or more if closed or at the final grade;
 3. Collect gas at a sufficient extraction rate; and

4. Be designed to minimize off-site migration of subsurface gas.
- c. A passive collection system shall:
1. Comply with conditions 4.1.2.b.1, 4.1.2.b.2, and 4.1.2.b.4; and
 2. 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.
- [45CSR§23-7.4.b]**
- 4.1.3. Control System --Control devices shall meet the following requirements, except as provided in 40 CFR § 60.24.
- a. 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 condition 7.8.d of 45CSR23; or
 - b. 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 condition 4.1.7.c 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 45CSR§23-7.
 1. If a boiler or process heater is used as the control device, the landfill gas stream shall be introduced into the flame zone.
 2. The control device shall be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in condition 4.2.2.
 3. For the closed landfill subcategory, the initial or most recent performance test to comply with section 4 or section 6 of 45CSR23 conducted on or before July 17, 2014 demonstrates compliance.
 - c. 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 conditions 4.1.3.a or 4.1.3.b.
 - d. All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of conditions 4.1.2 or 4.1.3. Atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of conditions 4.1.2 and 4.1.3.
- [45CSR§23-7.4.c]**
- 4.1.4. 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 control system according to conditions 4.1.2 and 4.1.3 or calculate an initial NMOC emissions rate for the landfill using the procedures specified in conditions 4.3.1 through 4.3.5. The NMOC emissions rate shall be recalculated annually except as provided in condition 4.5.2.c.
- a. If the calculated NMOC emission rate is less than 34 megagrams per year, the owner or operator shall:

1. Submit an annual NMOC emission rate report per 4.5.2 except as provided in 4.5.2.c; and
2. Recalculate the NMOC emission rate annually per conditions 4.3.1 through 4.3.5 until either the calculated NMOC emission rate is equal to or greater than 34 megagrams per year or the landfill is closed.
 - i. 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:
 - A. Comply with 4.1.2 and 4.1.3;
 - B. Calculate NMOC emissions using the next higher tier in conditions 4.3.1 through 4.3.5 and 4.1.7; or
 - C. Conduct a surface emission monitoring demonstration according to condition 4.3.5.
 - ii. The owner or operator shall submit a closure report per condition 4.5.5 if the landfill is permanently closed, except for the exemption allowed under paragraph 45CSR§23-7.2.d.4.
 - iii. If the most recently calculated NMOC emissions rate is equal to or greater than 50 megagrams per year for the closed landfill subcategory, the owner or operator shall either:
 - A. Submit a gas collection and control system design plan per 4.5.3, except for the exemptions allowed under paragraph 45CSR§23-7.2.d.3, and install a collection and control system per conditions 4.1.2 and 4.1.3;
 - B. Calculate NMOC emissions using the next higher tier in conditions 4.3.1 through 4.3.5 and 4.1.7; or
 - C. Conduct a surface emission monitoring demonstration according to the requirements of condition 4.3.5.
- b. 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:
 1. Submit a collection and control system design plan prepared by a professional engineer to the Secretary within one year as required by condition 4.5.3, except for the exemption allowed under 45CSR§23-7.2.d.3.
 2. Calculate the NMOC emissions using a higher tier in conditions 4.3.1 through 4.3.5 and 4.1.7; or
 3. Conduct a surface emission monitoring demonstration according to the requirements under condition 4.3.5.
- c. For the closed landfill subcategory, if the calculated NMOC emission rate is equal to or greater than 50 megagrams per year using Tier 1, 2, or 3 procedures, the owner or operator shall either:
 1. Submit a collection and control system design plan as required by condition 4.5.3, except for the exemption allowed under 45CSR§23-7.2.d.3.
 2. Calculate NMOC emissions using a higher tier in conditions 4.3.1 through 4.3.5 and 4.1.7; or

3. Conduct a surface emission monitoring demonstration according to the requirements under condition 4.3.5.

[45CSR§23-7.4.e]

- 4.1.5. Removal criteria -- The owner or operator may cap, remove, or decommission the collection and control system if the following criteria are met.
 - a. The landfill is a closed landfill and a closure report was submitted to the Secretary per condition 4.5.5;
 - b. 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;
 - c. The NMOC emission rate at the landfill is less than 34 megagrams per year on three successive test dates, calculated per condition 4.1.7.a. The test dates shall be a minimum of 90 days apart and a maximum of 180 days apart; and
 - d. The NMOC emission rate for the closed landfill subcategory is less than 50 megagrams per year on three successive test dates, as calculated per condition 4.1.7.a. The test dates shall be a minimum of 90 days apart and a maximum of 180 days apart

[45CSR§23-7.4.f]

- 4.1.6. Specifications for active collection systems.

- a. To comply with condition 4.1.2, 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.
 1. 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:
 - i. Depths of refuse;
 - ii. Refuse gas generation rates and flow characteristics;
 - iii. Cover properties;
 - iv. Gas system expandability;
 - v. Leachate and condensate management;
 - vi. Accessibility;
 - vii. Compatibility with filling operations;
 - viii. Integration with closure end use;
 - ix. Air intrusion control;
 - x. Corrosion resistance;

- xi. Fill settlement;
 - xii. Resistance to the refuse decomposition heat; and
 - xiii. Ability to isolate individual components or sections for repair or troubleshooting without shutting down the entire collection system.
2. The sufficient density of gas collection devices determined in condition 4.1.6.a shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.
3. The placement of gas collection devices shall control all gas producing areas, except as provided by conditions i and ii below.
- i. Any segregated area of asbestos or nondegradable material may be excluded from collection if documented per condition 4.4.4. 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.
 - ii. 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.
 - A. The NMOC emissions from each section proposed for exclusion shall be calculated using Equation 1:

$$Q_i = 2kL_0M_i(e^{-kt_i})(C_{NMOC})(3.6 * 10^{-9}) \text{ Equation (1)}$$

Where:

- Q_i = NMOC emission rate from the i^{th} section, megagrams per year.
- k = Methane generation rate constant, year^{-1} .
- L_0 = Methane generation potential, cubic meters per megagram solid waste.
- M_i = Mass of the degradable solid waste in the i^{th} section, megagram.
- t_i = Age of the solid waste in the section, years.
- C_{NMOC} = Concentration of NMOC, ppm by volume.
- $3.6 * 10^{-9}$ = Conversion factor.

- 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 4.1.7 or Equation 1.
- iii. 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 condition 4.1.7 or the alternative values from condition 4.1.7. 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 condition 4.1.6.a.3.i.

- b. To comply with condition 4.1.2, the owner or operator shall construct the gas collection devices using the following equipment or procedures:
 1. 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:
 - i. Convey projected amounts of gases;
 - ii. Withstand installation, static, and settlement forces; and
 - iii. Withstand planned overburden or traffic loads.
 - iv. The collection system shall extend as necessary to comply with emission and migration standards.
 - v. 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.
 2. Vertical wells shall:
 - i. Be placed to avoid endangering underlying liners; and
 - ii. Shall address the occurrence of water within the landfill.
 3. 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.
 4. 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.
 5. The dimension of any gravel used around pipe perforations shall be sized not to penetrate or block the perforations.
 6. Collection devices may be connected to the collection header pipes below or above the landfill surface.
 - i. 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.
 - ii. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel or other nonporous material of suitable thickness to prevent discharge.

- c. To comply with condition 4.1.3, the owner or operator shall convey the landfill gas through header piping to a control system in compliance with condition 4.1.3. 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.
 1. 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 4.1.6.c.2.
 2. For new collection systems, the maximum flow rate shall comply with condition 7.7.a.1 of 45CSR23.
- d. Operational standards for collection and control systems. -- Each owner or operator shall comply with the operational standards in this condition and the requirements of subsections 4.2.1 and 4.2.2; or the operational standards from 40 CFR 63, subpart AAAA provided in 40 CFR § 63.1958 as well as the provisions in 40 CFR §§ 63.1960 and 63.1961; or both sets of requirements as an alternative means of compliance, for an MSWL with a gas collection and control system used to comply with conditions 4.1.2 and 4.1.3. Once the owner or operator begins to comply with the provisions of 40 CFR § 63.1958, the owner or operator shall continue to operate the collection and control device according to those provisions and cannot return to the requirements of this condition. Each owner or operator of an MSWL with a gas collection and control system used to comply with conditions 4.1.2 and 4.1.3 shall:
 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:
 - i. Five years or more if active; or
 - ii. Two years or more if closed or at final grade.
 2. Operate the collection system with negative pressure at each wellhead except under the following conditions:
 - i. 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 condition 4.5.7.
 - ii. 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 condition 4.5.3.
 - iii. 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 condition 4.5.3.
 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:
 - i. The owner or operator shall submit a higher operating value demonstration to the Secretary; and
 - ii. The supporting data shall demonstrate that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens; and

- iii. The Secretary approved the higher value operating temperature.
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:
 - i. Conduct surface testing using an organic vapor analyzer, flame ionization detector or other portable monitor meeting the specifications in subdivision 4.2.1.d;
 - ii. 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;
 - iii. Monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required; and
 - iv. 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.
 - v. To determine if the level established in condition 4.1.6.d.4. is exceeded, the owner or operator may:
 - A. Establish an alternative traversing pattern that ensures equivalent coverage; and
 - B. Exclude from the surface testing areas with steep slopes or other dangerous areas.
5. Vent all collected gases to a control system designed and operated in compliance with subdivision 4.1.3. In the event the collection or control system stops operating, the owner or operator shall:
 - i. Shut down the gas mover system; and
 - ii. 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.
6. Operate the control system at all times when the collected gas is routed to the system.
7. Take corrective action as specified in conditions 4.2.1.a.3 and 4.2.1.a.4 or condition 4.2.1.c if monitoring demonstrates that the operational requirements in conditions 4.1.6.d.2, 4.1.6.d.3, or 4.1.6.d.4 are not satisfied. If the owner or operator takes corrective actions per condition 4.2.1, the Secretary shall not consider the monitored exceedance a violation of the operational requirements in this section.

[45CSR§23-7.5]

4.1.7.

- a. 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 condition 4.1.5., using Equation 4:

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

Where:

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

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

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

1. The owner or operator shall determine the flow rate of landfill gas, Q_{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.
 2. The owner or operator shall determine the average NMOC concentration, C_{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_{NMOC} as carbon to C_{NMOC} as hexane.
 3. The owner or operator may use another method to determine:
 - i. Landfill gas flow rate if the owner or operator received prior approval for the alternate method by the Administrator; and
 - ii. NMOC concentration if the owner or operator received prior approval for the alternate method by the Administrator.
 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 condition 4.5.9.b.
- b. 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.
 - c. For the performance test required by condition 4.1.3.b, 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 of 40 CFR part 60, Appendix A and 45CSR16. 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 to determine the landfill gas molecular weight for calculating the flare gas exit velocity under 40 CFR § 60.18(f)(4).
 - d. For the performance test required by condition 4.1.3.b, 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 condition 7.9.d.2 of 45CSR23. 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.

- e. Within 60 days after the date of completing each performance test according to conditions 4.1.7.c and 4.1.7.d, the owner or operator shall submit the performance test results required by conditions 4.1.7.a and 4.1.7.c including any associated fuel analyses per condition 4.5.9.a.
[45CSR§§23-7.6.b through 7.6.f]

4.2. Monitoring Requirements

4.2.1. Compliance requirements. Each owner or operator shall comply with the compliance requirements in this condition and the requirements in conditions 4.1.6.d and 4.2.2; or the compliance provisions from 40 CFR 63, subpart AAAA provided in 40 CFR § 63.1960, as well as the provisions in 40 CFR §§ 63.1958 and 63.1961; or both sets of requirements as an alternative means of compliance, for an MSWL with a gas collection and control system used to comply with subdivisions 4.1.2 and 4.1.3. Once the owner or operator begins to comply with the provisions of 40 CFR § 63.1960, the owner or operator shall continue to operate the collection and control device according to those provisions and cannot return to the requirements of this subsection.

- a) The owner or operator shall use the specified methods in conditions 4.2.1.a.1 through 4.2.1.a.6, except as provided in condition 4.5.3.b, to determine whether the gas collection system is in compliance with condition 4.1.2.b.
1. To determine compliance with condition 4.1.2.b.1, 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 condition 4.3.3. 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.
- i. 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, $year^{-1}$.

t = Age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure, t is the age of the landfill at installation, years.
 c = Time since closure, years (for an active landfill $c = 0$ and $e^{-kc} = 1$).

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

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

Where:

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

k = Methane generation rate constant, year⁻¹.

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

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

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

- iii. 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.
2. To demonstrate compliance with condition 4.1.2.b.2 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.
3. To demonstrate compliance with condition 4.1.2.b.3, 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 condition 4.1.6.d.2 below. The owner or operator shall not cause exceedances of other operational or performance standards by use of any attempted corrective measure.
- i. 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 condition 4.4.5.c below.
- ii. If the owner or operator cannot fully implement corrective actions within 60 days following the positive pressure or elevated temperature 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 measurement of landfill gas temperature greater than 55

- degrees Celsius (131 degrees Fahrenheit) or positive pressure measurement. The owner or operator shall keep records per condition 4.4.5.d below and submit the items required by condition 4.5.7.g in the next annual report.
- iii. 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 conditions 4.5.7.g and 4.5.10 and keep records according to condition 4.4.5.e.
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 condition 4.1.6.d.3. 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.
 - i. 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 condition 4.4.5.c below.
 - ii. 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 condition 4.4.5.d and submit the information listed in condition 4.5.7.g in the next annual report.
 - iii. 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 condition 4.5.7.g and condition 4.5.10 and maintain records per condition 4.4.5.e.
 5. An owner or operator seeking to demonstrate compliance with condition 4.1.2.b.4 through the use of a collection system that does not meet the specifications of subdivision 4.1.6 shall provide information satisfactory to the Administrator according to 4.5.3.c demonstrating that the owner or operator is controlling off-site migration.
- b) To comply with condition 4.1.6.d.1, the owner or operator shall place each well or design component as specified in the approved design plan per condition 4.5.3. 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:
 1. Five years or more if active; or
 2. Two years or more if closed or at final grade.

- c) To comply with the surface methane operational standard of condition 4.1.6.d.4, the owner or operator shall follow the procedures listed below:
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 condition 4.2.1.d;
 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;
 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;
 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 condition 4.1.6.d.4. The owner or operator shall:
 - i. 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 four meters and written in decimal degrees with at least five decimal places;
 - ii. 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;
 - iii. 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 condition 4.2.1.c.4.v;
 - iv. 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 conditions 4.2.1.c.4.iii or 4.2.1.c.4.v; and
 - v. 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.

5. Implement a program to monitor cover integrity on a monthly basis and implement cover repairs as necessary.
- d) The owner or operator shall meet the following instrumentation specifications and procedures for surface emission monitoring devices to comply with the provisions in conditions 4.2.1.c or 4.3.5:
 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”;
 2. The calibration gas shall be methane, diluted to a nominal concentration of 500 ppm in air;
 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
 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.
- e) The provisions of 45CSR§23-7 apply at all times, including period of startup, shutdown, or malfunction. During periods of startup, shutdown or malfunction, the owner or operator shall comply with the work practice specified in condition 4.1.6.d.5 in lieu of the compliance provisions of this condition.

[45CSR§23-7.7]

- 4.2.2. Monitoring requirements. Each owner or operator shall comply with the monitoring requirements in this condition except as provided in condition 4.5.3.b, the requirements of subdivision 4.1.6.d and condition 4.2.1; or the monitoring provisions from 40 CFR 63, subpart AAAAA provided in 40 CFR § 63.1961, as well as the provisions in 40 CFR §§ 63.1958 and 63.1960; or both sets of requirements as an alternative means of compliance, for an MSWL with a gas collection and control system used to comply with subdivisions 4.1.2 and 4.1.3. Once the owner or operator begins to comply with the provisions of 40 CFR § 63.1961, the owner or operator shall continue to operate the collection and control device according to those provisions and cannot return to the requirements of this subsection.
 - a) To comply with condition 4.1.2.b. 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:
 1. Measure the gauge pressure in the gas collection header monthly per condition 4.2.1.a.3; and
 2. Monitor nitrogen or oxygen concentration in the landfill gas monthly as follows:
 - i. Determine the nitrogen level using Method 3C of 40 CFR part 60, Appendix A and 45CSR16, unless the owner or operator establishes an alternative test method as allowed by condition 4.5.3.b;
 - ii. 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 condition 4.5.3.b, except that:
 - A. The span shall be set between ten percent and 12 percent oxygen;

- B. A data recorder is not required;
 - C. Only two calibration gases are required, a zero and span;
 - D. A calibration error check is not required; and
 - E. The allowable sample bias, zero drift, and calibration drift are plus or minus 10 percent.
- iii. Use a portable gas composition analyzer to monitor the oxygen levels: provided, that:
 - A. The analyzer is calibrated; and
 - B. The analyzer meets all quality assurance and quality control requirements for Method 3A or ASTM D6522-11.
- 3. Monitor the temperature of the landfill gas on a monthly basis per condition 4.2.1.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.
- b) If the owner or operator seeks to comply with condition 4.1.3 using an enclosed combustor, the owner or operator shall calibrate, maintain, and operate the following equipment according to the manufacturer's specifications:
 - 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;
 - 2. For a device that records flow to the control device and bypass of the control device (if applicable), the owner or operator shall:
 - i. Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; and
 - ii. Secure the bypass line valve in the closed position with a car-seal or a lock and key type configuration, 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.
- c) If the owner or operator chooses to comply with condition 4.1.3 using a non-enclosed flare, the owner or operator shall install, calibrate, maintain, and operate the following equipment according to the manufacturer's specifications:
 - 1. A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame;
 - 2. For a device that records flow to the flare and bypass of the flare (if applicable), the owner or operator shall:

- i. Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; and
 - ii. Secure the bypass line valve in the closed position with a car-seal or a lock and key type configuration, 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.
- d) If the owner or operator chooses to comply with condition 4.1.3 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 condition 4.5.3.b 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.
- e) If the owner or operator chooses to install a collection system that does not meet the specifications of condition 4.1.6.a through c or seeks to monitor alternative parameters to those required by conditions 4.1.6.d, 4.1.7, 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.2.1, and 4.2.2, the owner or operator shall provide information satisfactory to the Administrator as provided in conditions 4.5.3.b and 4.5.3.c describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator may specify additional appropriate monitoring procedures.
- f) To demonstrate compliance with the 500 ppm surface methane operational standard in condition 4.1.6.d.4, the owner or operator shall monitor surface concentrations of methane according to the requirements of condition 4.2.1.c and the instrument specifications of condition 4.2.1.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.
- g) To demonstrate compliance with the control system requirements in condition 4.1.3 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 condition 4.4.2.e.2. 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:
 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
 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.
- h) The monitoring requirements of conditions 4.2.2.b, 4.2.2.c, 4.2.2.d, and 4.2.2.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.

[45CSR§23-7.8]

4.3. Testing Requirements

4.3.1. NMOC emission rate:

- a) The owner or operator shall calculate the NMOC emission rate using either Equation 2 or Equation 3 below:
- b) The owner or operator may use both Equation 2 and Equation 3 if:
 1. The owner or operator knows the actual year-to-year solid waste acceptance rate for part of the life of the landfill; or
 2. The owner or operator does not know the actual year-to-year solid waste acceptance rate for part of the life of the landfill.
- c) The owner or operator shall use the following values in both Equation 2 and Equation 3:
 1. k is 0.05 per year,
 2. L_o is 170 cubic meters per megagram, and
 3. C_{NMOC} is 4,000 ppm by volume as hexane.
 4. 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.
- d) The owner or operator shall use Equation 2 if the actual year-to-year solid waste acceptance rate is known. 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⁻¹.

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

M_i = Mass of solid waste in the i^{th} section, megagrams.
 t_i = Age of the i^{th} section, years.
 C_{NMOC} = Concentration of NMOC, ppm by volume as hexane.
 3.6×10^{-9} = Conversion factor.

- e) The owner or operator shall use Equation 3 if the actual year-to-year solid waste acceptance rate is unknown. 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.

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

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⁻¹.
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 $e^{-kc} = 1$.
 3.6×10^{-9} = Conversion factor.

- f) Tier 1 procedures. -- The owner or operator shall compare the calculated NMOC mass emission rate to the standard of 34 megagrams per year:
1. If the owner or operator calculates the NMOC emission rate by the methods specified in conditions 4.3.1.a through 4.3.1.c and it is less than 34 megagrams per year, then the owner or operator shall submit an NMOC emission rate report according to condition 4.5.2. and shall recalculate the NMOC mass emission rate annually as required by condition 4.5.4.
 2. If the owner or operator calculates the NMOC emission rate by the methods specified in conditions 4.3.1.a through 4.3.1.c and it is equal to or greater than 34 megagrams per year, then the owner or operator shall either:
 - i. Submit a gas collection and control system design plan within one year as specified in condition 4.5.3 and install and operate a gas collection and control system within 30 months according to conditions 4.1.2 and 4.1.3; or
 - ii. Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the Tier 2 procedures in condition 4.3.1.g; or
 - iii. Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the Tier 3 procedures in condition 4.3.3.
- g) Tier 2 -- NMOC Calculation. The owner or operator shall determine the site specific NMOC concentration using the following sampling procedure:
1. Install a minimum of two sample probes per hectare, evenly distributed over the landfill surface that has retained waste for at least two years;

2. 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;
3. The owner or operator should locate the sample probes so as to avoid known areas of nondegradable solid waste;
4. 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;
5. 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:
 - i. 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;
 - ii. 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
 - iii. The owner or operator shall terminate compositing before the cylinder approaches ambient pressure when the measurement accuracy diminishes.
6. 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. The owner or operator shall divide the NMOC concentration from Method 25 or 25C by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.
8. 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 condition 4.3.1.g.1.
9. If the landfill has active collection systems, the owner or operator may collect samples from the common header pipe according to the following:
 - i. The owner or operator shall use a sample location upstream from any gas moving, condensate removal or treatment system equipment; and
 - ii. The owner or operator shall collect a minimum of three samples.

[45CSR§§23-7.6.a.1 through 7.6.a.7]

4.3.2. Tier 2 procedures.

- a) The owner or operator shall submit the NMOC concentration results and the NMOC mass emission rate per condition 4.5.9.b within 60 days from the date the owner or operator determined the NMOC concentration and corresponding NMOC emission rate.

- 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 condition 4.3.1.c.
- 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 condition 4.5.2 and shall recalculate the NMOC mass emission rate annually per condition 4.1.4. The owner or operator shall retest the site-specific NMOC concentration every five years using the methods specified in conditions 4.3.1 through 4.3.5 and 4.1.7.
- 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:
 - 1. Submit a gas collection and control system design plan within one year per condition 4.5.3 and install and operate a gas collection and control system within 30 months per conditions 4.1.2 and 4.1.3;
 - 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 condition 4.3.3.; and
 - 3. Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in condition 4.3.5.

[45CSR§23-7.6.a.8]

4.3.3. Tier 3. -- Site specific methane generation rate constant. The owner or operator shall:

- a) Determine the site-specific methane generation rate constant using the procedures in Method 2E of 40 CFR Part 60, Appendix A and 45CSR16;
- 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 condition 4.3.1.g;
- c) Compare the resulting NMOC mass emission rate to the standard of 34 megagrams per year;
- 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:
 - 1. Submit a gas collection and control system design plan within one year as per condition 4.5.3 and install and operate a gas collection and control system within 30 months according to conditions 4.1.2 and 4.1.3; or
 - 2. Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in condition 4.3.5.
- e) If the NMOC mass emission rate is less than 34 megagrams per year, the owner or operator shall:
 - 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

2. Submit the NMOC emission rate report per condition 4.5.2.
- 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.
[45CSR§23-7.6.a.9]
- 4.3.4. 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 conditions 4.3.1.c and 4.3.1.d if the Administrator approved the method in advance.
[45CSR§23-7.6.a.10]
- 4.3.5. Tier 4. -- Surface emission monitoring demonstration
- a) Applicability. The owner or operator shall only use Tier 4 procedures if the unit can demonstrate the following:
 1. Surface methane emissions are below 500 ppm;
 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;
 3. The landfill meets the requirements of condition 4.3.5.j below; and
 4. NMOC emissions are less than 50 Mg/yr as indicated by both Tier 1 and Tier 2; if NMOC emissions are greater than 50 Mg/yr, the owner or operator shall not use Tier 4.
 - b) The owner or operator shall conduct surface emission monitoring quarterly according to the requirements in condition 4.3.5.
 - 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 condition 4.2.1.d along the entire perimeter of the landfill and along a pattern that traverses the landfill at less than 30 meter intervals.
 - 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.
 - e) The owner or operator shall perform surface emission monitoring per Section 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.
 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.

2. The owner or operator shall monitor landfill surface areas using a device that meets the specifications of condition 4.2.1.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.
- f) The owner or operator shall maintain records of surface emission monitoring per condition 4.4.6 and submit a Tier 4 surface emissions report per condition 4.5.3.d.3.
 - 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 condition 4.5.3. The owner or operator shall install and operate a gas collection and control system according to conditions 4.1.2 and 4.1.3 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.
 - 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.
 - 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.
 - j) If the owner or operator installed and operated a collection and control system that is not required by 45CSR§23-7, then the collection and control system shall meet the following criteria:
 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
 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.

[45CSR§23-7.6.a.11]

4.4. Recordkeeping Requirements

- 4.4.1. Except as provided in condition 4.5.3.b, each owner or operator of an MSWL subject to the provisions of condition 4.1.4 shall keep on-site records of the design capacity report that triggered condition 4.1.5, 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.
[45CSR§23-7.10.a]
- 4.4.2. Except as provided in condition 4.5.3.b, the owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control system equipment of the data listed in conditions a through e below, as measured during the initial performance test or compliance determination. The owner or operator shall maintain records of subsequent tests or monitoring for a minimum of five years. Records of the control device vendor specifications shall be maintained until the control device is removed.

- a) To demonstrate compliance with the collection system requirements of condition 4.1.2, the owner or operator shall keep a record of:
 1. The maximum expected gas generation flow rate as calculated in condition 4.2.1.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
 2. The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined per condition 4.1.6.a.1.
- b) To demonstrate compliance with the control system requirements of condition 4.1.3 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:
 1. The average temperature measured at least every 15 minutes and averaged over the same time period of the performance test; and
 2. The percent reduction of NMOC achieved by the control device determined per condition 4.1.3.b.
- c) To demonstrate compliance with condition 4.1.3.a 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.
- d) To demonstrate compliance with condition 4.1.3.b.1 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.
- e) To demonstrate compliance with condition 4.1.3.c through the use of a landfill treatment system the owner or operator shall keep:
 1. Bypass records. – Records of the flow of landfill gas to, and bypass of, the treatment system; and
 2. A site specific treatment monitoring plan, to include:
 - i. 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, de-watering, and compression parameters that ensure the treatment system is operating properly for each intended end use of the treated landfill gas;
 - ii. 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;
 - iii. Documentation of the monitoring methods and ranges, along with justification for their use;

- iv. Identification of who is responsible (by job title) for data collection;
- v. Documentation of processes and methods used to collect the necessary data; and
- vi. Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems.

[45CSR§23-7.10.b]

4.4.3. Except as provided in condition 4.5.3.b, the owner or operator shall keep for five years up-to-date, readily accessible, continuous records of the equipment operating parameters required by condition 4.2.2, 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.

a) The following constitute exceedances that the owner or operator shall record and report under section 4.5:

- 1. 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 condition 4.1.3 during the most recent performance test; and
- 2. For boilers or process heaters, whenever there is a change in the location where the vent stream is introduced into the flame zone per condition 4.4.2.c.

b) 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 condition 4.2.2.

c) If the owner or operator uses a boiler or process heater with a design heat input capacity greater than 44 megawatts to comply with condition 4.1.3, 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).

d) Each owner or operator seeking to comply with the provisions of 45SCR§23-7 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 condition 4.2.2.c, and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

e) Each owner or operator seeking to comply with condition 4.1.4 using an active collection system designed per condition 4.1.2, shall keep records of periods when the collection system or control device is not operating.

[45CSR§23-7.10.c]

4.4.4. 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 condition 4.5.3.b. The owner or operator shall keep:

- a) Up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under subdivision 4.2.1.b.; and
- b) Readily accessible documentation of the nature, date of deposition, amount, and location of asbestos containing or nondegradable waste excluded from collection under part 4.1.6.a.3.i and any nonproductive areas excluded from collection under part 4.1.6.a.3.ii.

[45CSR§23-7.10.d]

4.4.5. The owner or operator shall keep up-to-date, readily accessible records of the items in 4.4.5.a through 4.4.5.e, except as provided in condition 4.5.3.b, for a minimum of five years. Each owner or operator that chooses to comply with the provisions in 40 CFR §§ 63.1958, 63.1960 and 63.1961 of this chapter, as allowed in conditions 4.1.6.d, 4.2.1, and 4.2.2, shall keep the records in condition 4.4.5.f and shall keep records according to 40 CFR § 63.1983(e)(1) through (5) in lieu of conditions 4.4.5.a – 4.4.5.e:

- a) All collection and control system exceedances of the operational standards in condition 4.1.6.d, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance;
- b) Each wellhead temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit) or above, each wellhead nitrogen level at or above 20 percent, and each wellhead oxygen level at or above five percent;
- c) 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 conditions 4.2.1.a.3 or 4.2.1.a.4;
- d) 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 conditions 4.2.1.a.3.ii or 4.2.1.a.4.ii; and
- e) 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 conditions 4.2.1.a.3.iii or 4.2.1.a.4.iii.
- f) Each owner or operator that chooses to comply with the provisions in 40 CFR §§ 63.1958, 63.1960 and 63.1961, as allowed in conditions 4.1.6.d, 4.2.1, and 4.2.2, shall keep records of the date upon which the owner or operator started complying with the provisions in 40 CFR §§ 63.1958, 63.1960, and 63.1961.

[45CSR§23-7.10.e]

4.4.6. To demonstrate that site-specific surface methane emissions are below 500 ppm by conducting surface emission monitoring under the Tier 4 procedures specified in condition 4.3.5, 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:

- a) Calibration records:
 - 1. Date of calibration and initials of operator performing the calibration;
 - 2. Calibration gas cylinder identification, certification date, and certified concentration;
 - 3. Instrument scale(s) used;
 - 4. A description of any corrective action taken if the meter readout could not be adjusted to correspond to the calibration gas value; and
 - 5. If the owner or operator makes its own calibration gas, a description of the procedure used.
 - b) 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;
 - c) Time stamp of each surface scan reading:
 - 1. The time stamp should be detailed to the nearest second, based on when the sample collection begins; and
 - 2. 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).
 - d) 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;
 - e) Monitored methane concentration (ppm) of each reading;
 - f) Background methane concentration (ppm) after each instrument calibration test;
 - g) Adjusted methane concentration using most recent calibration (ppm);
 - h) For readings taken at each surface penetration, the unique identification location label matching the label specified in condition 4.4.4; and
 - i) Records of the operating hours of the gas collection system for each destruction device.
[45CSR§23-7.10.g]
- 4.4.7. The owner or operator shall keep up-to-date, readily accessible records of all collection and control system monitoring data for parameters measured in conditions 4.2.2.a.1, 4.2.2.a.2, and 4.2.2.a.3 for a minimum of five years, except as provided in condition 4.5.3.b.
[45CSR§23-7.10.h]
- 4.4.8. The owner or operator may maintain in electronic format any documents required to be maintained by section 4 that it submitted electronically via EPA's CDX.
[45CSR§23-7.10.i]

- 4.4.9. If the owner or operator reports leachate or other liquids addition under condition 4.5.11, 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.

[45CSR§23-7.10.j]

4.5. Reporting Requirements

- 4.5.1. Design Capacity Report – The owner or operator shall submit the initial design capacity report no later than one year from the effective date of 45CSR23. The initial design capacity report shall contain the following information:

- a) 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
- b) 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.

[45CSR§23-7.9.a]

- 4.5.2. 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 condition 4.5.9.b no later than one year from the effective date of 45CSR23. The owner or operator shall submit the NMOC emission rate report to the Secretary annually per condition 4.5.9.b, except as provided for in condition 4.5.2.c. The Secretary may request additional information as may be necessary to verify the reported NMOC emission rate. The NMOC emission rate report shall:

- a) Contain an annual or five-year estimate of the NMOC emission rate calculated using the formula and procedures in conditions 4.3.1 through 4.3.5 or 4.1.7.a, as applicable; and
- b) Include all the data, calculations, sample reports, and measurements used to estimate the annual or five year emissions.
- c) The owner or operator may follow the requirements in condition 4.5.9.b 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.

- d) 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 conditions 4.1.2 and 4.1.3 during the time the collection and control system is in operation and complies with conditions 4.1.6.b and 4.2.1.

[45CSR§23-7.9.c]

4.5.3. 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:

- a) The collection and control system described in the design plan shall meet the design requirements of subdivisions 4.1.2 and 4.1.3
- b) The collection and control system design plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of condition 4.1.6.d and 45CSR§§23-7.6 through 7.10 proposed by the owner or operator;
- c) The collection and control system design plan shall either conform to specifications for active collection systems in condition 4.1.6.a through c or include a demonstration of sufficiency for the alternative provisions to condition 4.1.6.a through c that is satisfactory to the Administrator;
- d) 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:
 - 1. If the owner or operator elects to recalculate the NMOC emission rate after the Tier 2 NMOC sampling and analysis in condition 4.3.3 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 condition 4.5.9.b 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.
 - 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 per condition 4.3.3, 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 condition 4.5.9.b 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 condition 4.3.3 and the resulting site-specific methane generation rate constant k .

3. If the owner or operator elects to demonstrate that site-specific surface methane emissions are below 500 ppm methane, based on the provisions of condition 4.3.5, then the owner or operator shall annually submit a Tier 4 surface emissions report per condition 4.5.9.b 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.
 - i. 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 condition 4.5.9.b below; and
 - ii. 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 condition 4.5.9.b below.
4. 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:
 - i. If the owner or operator elects to recalculate the NMOC emission rate after the Tier 2 NMOC sampling and analysis under condition 4.3.1.g 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 condition 4.5.9.b, within 180 days of the first calculated exceedance of 50 megagrams per year.
 - ii. 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 condition 4.3.3, 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 condition 4.3.3 and the resulting site-specific methane generation rate constant k , to the Secretary following the procedure specified in

condition 4.5.9.b within one year of the first calculated NMOC emission rate equaling or exceeding 50 megagrams per year.

- iii. If the owner or operator elects to demonstrate surface emissions are low, consistent with the provisions in condition 4.5.3.d.3; and
 - iv. 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 45CSR23.
- e) 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 condition 4.5.3.f. 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.
- f) Upon receipt of an initial or revised design plan, the Secretary shall review the information submitted under conditions 4.5.3.a through 4.5.3.c 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.
- g) 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 condition 4.4.2.e.

[45CSR§23-7.9.d]

4.5.4. Revised design plan - If the owner or operator is required to submit a design plan under condition 4.5.3 or sections 4 or 6 of 45CSR23, the owner or operator shall submit a revised design plan to the Secretary for approval as follows:

- a) At least 90 days before expanding operations to an area not covered by the previously approved design plan; or
- b) 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 4.5.3.

[45CSR§23-7.9.e]

- 4.5.5. 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).

[45CSR§23-7.9.f]

- 4.5.6. 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:

- a) A copy of the closure report submitted per condition 4.5.5. and:
- b) 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
- c) 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
- d) 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.
- e) 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 condition 4.1.5.

[45CSR§23-7.9.g]

- 4.5.7. Annual report. -- If the owner or operator chooses to comply with condition 4.1.4.b using an active collection system designed per condition 4.1.2, the owner or operator shall submit an annual report to the Secretary according to condition 4.5.9.b, containing the information listed in condition 4.5.7. 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 condition 4.5.9.a no later than the date the owner or operator submits the initial annual report. For enclosed combustion devices and flares, reportable exceedances are defined under condition 4.4.3.a. If the owner or operator chooses to comply with the operational provisions of 40 CFR §§ 63.1958, 63.1960, and 63.1961, as allowed under conditions 4.1.6.d, 4.2.1, and 4.2.2, the owner or operator

shall follow the semi-annual reporting requirements in 40 CFR § 63.1981(h) in lieu of this paragraph. The annual report shall contain:

- a) The value and length of time for exceedance of applicable parameters monitored under condition 4.2.2.a.1 and conditions 4.2.2.b, 4.2.2.c, 4.2.2.d, and 4.2.2.g;
- b) 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 condition 4.2.2;
- c) 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;
- d) All periods when the collection system was not operating;
- e) The location of each exceedance of the 500 ppm methane concentration per condition 4.1.6.d.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;
- f) The date of installation and the location of each well or collection system expansion added pursuant to 4.2.1.a.3, 4.2.1.a.4, 4.2.1.b, and 4.2.1.c.4; and
- g) For any corrective action analysis for which corrective actions are required by 4.2.1.a.3 or 4.2.1.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.

[45CSR§23-7.9.h]

4.5.8. Initial performance test report. -- To comply with condition 4.1.3, the owner or operator shall include the following information with the initial performance test report required under 40 CFR § 60.8 and 45CSR16:

- a) 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;
- b) 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;
- c) 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;
- d) 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;
- e) 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
- f) The provisions for the control of off-site migration.

[45CSR§23-7.9.i]

4.5.9. Electronic Reporting – The owner or operator shall submit reports electronically according to the following:

- a) 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:
 1. 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 condition.
 2. 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.
- b) Each owner or operator required to submit reports following the procedure specified in this condition 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 4, regardless of the method of submittal.

[45CSR§23-7.9.j]

4.5.10. Corrective action and the corresponding timeline - The owner or operator shall submit the corrective action and the corresponding timeline reporting requirements according to conditions 4.5.10.a and 4.5.10.b. If the owner or operator chooses to comply with the operational provisions of 40 CFR §§ 63.1958, 63.1960, and 63.1961, as allowed under conditions 4.1.6.d, 4.2.1, and 4.2.2, the owner or operator shall follow the corrective action and the corresponding timeline reporting requirements in 40 CFR § 63.1981(j) in lieu of paragraphs 4.5.10.a and 4.5.10.b.

- a) For corrective action that is required by condition 4.2.1.a.3.iii or 4.2.1.a.4.iii 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.

- b) For corrective action that is required by conditions 4.2.1.a.3.iii or 4.2.1.a.4.iii 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.

[45CSR§23-7.9.k]

4.5.11. 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 condition 4.5.9.b, the following information:

- a) Volume of leachate recirculated (gallons per year) and the reported basis of those estimates (records or engineering estimates);
- b) Total volume of all other liquids added (gallons per year) and the reported basis of those estimates (records or engineering estimates);
- c) Surface area (acres) over which the leachate is recirculated (or otherwise applied);
- d) Surface area (acres) over which any other liquids are applied;
- e) 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
- f) 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.
- g) The initial report shall contain items in conditions 4.5.11.a through 4.5.11.f 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:
 - 1. September 27, 2017 for landfills that commenced construction, modification or reconstruction after July 17, 2014 but before August 29, 2016; or
 - 2. 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.
- h) Subsequent annual reports shall contain items in 4.5.11.a through 4.5.11.f 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.
- i) Landfills in the closed landfill subcategory are exempt from the reporting requirements contained in conditions 4.5.11.a through 4.5.11.g.

- j) The owner or operator may cease annual reporting of items in conditions 4.5.11.a through 4.5.11.f after the owner or operator has submitted the closure report per subdivision 4.5.5.
[45CSR§23-7.9.i]

4.5.12. Tier 4 notification

- a) 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 condition 4.3.5. 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.
- b) 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 condition 4.3.4.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.
[45CSR§23-7.9.m]

- 4.5.13. Each owner or operator that chooses to comply with the provisions in 40 CFR §§ 63.1958, 63.1960, and 63.1961, as allowed in conditions 4.1.6.d, 4.2.1, and 4.2.2 shall submit the 24-hour high temperature report according to 40 CFR § 63.1981(k).
[45CSR§23-7.9.n]

4.6. Compliance Plan

- 4.6.1. None