

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:

Tucker County Solid Waste Authority

Tucker County Sanitary Landfill

R30-09300026-2024

Laura M. Crowder

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Director, Division of Air Quality

Issued: October 29, 2024 • Effective: November 12, 2024
Expiration: October 29, 2029 • Renewal Application Due: April 29, 2029

Permit Number: **R30-09300026-2024**
Permittee: **Tucker County Solid Waste Authority**
Facility Name: **Tucker County Sanitary Landfill**
Permittee Mailing Address: **PO Box 445, Davis, WV, 26260**

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:	Davis, Tucker County, West Virginia
Telephone Number:	304-259-4867
Type of Business Entity:	Governmental Agency
Facility Description:	Municipal Solid Waste Landfill
SIC Codes:	4953
UTM Coordinates:	632.0 km Easting • 4333.7 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	1989	4,367,000 tons	None
T-1	T-1	Diesel Fuel Tank	2018	500 gal	None
T-2	T-2	Diesel Fuel Tank	2021	1670 gal	None
T-3	T-3	Diesel Fuel Tank	2006	1670 gal	None
T-4	T-4	Gasoline Tank	2006	290 gal	None
T-5	T-5	Leachate Tank	1994	40,000 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
CBI	Confidential Business Information		Standards
CEM	Continuous Emission Monitor	PM	Particulate Matter
CES	Certified Emission Statement	PM₁₀	Particulate Matter less than 10µm in diameter
C.F.R. or CFR	Code of Federal Regulations		
CO	Carbon Monoxide	pph	Pounds per Hour
C.S.R. or CSR	Codes of State Rules	ppm	Parts per Million
DAQ	Division of Air Quality	PSD	Prevention of Significant Deterioration
DEP	Department of Environmental Protection	psi	Pounds per Square Inch
FOIA	Freedom of Information Act	SIC	Standard Industrial Classification
HAP	Hazardous Air Pollutant		
HON	Hazardous Organic NESHAP	SIP	State Implementation Plan
HP	Horsepower	SO₂	Sulfur Dioxide
lbs/hr or lb/hr	Pounds per Hour	TAP	Toxic Air Pollutant
LDAR	Leak Detection and Repair	TPY	Tons per Year
m	Thousand	TRS	Total Reduced Sulfur
MACT	Maximum Achievable Control Technology	TSP	Total Suspended Particulate
		USEPA	United States Environmental Protection Agency
mm	Million		
mmBtu/hr	Million British Thermal Units per Hour	UTM	Universal Transverse Mercator
mmft³/hr or mmcf/hr	Million Cubic Feet Burned per Hour	VEE	Visual Emissions Evaluation
NA or N/A	Not Applicable		
NAAQS	National Ambient Air Quality Standards	VOC	Volatile Organic Compounds
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)(15)]
- 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. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit shall be revised in accordance with 45CSR§30-6.4 or 45CSR§30-6.5 as applicable.
- 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)(15-16)]

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

US EPA:

Section Chief
U. S. Environmental Protection Agency, Region III
Enforcement and Compliance Assurance Division

601 57th Street SE
Charleston, WV 25304

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 C.F.R. §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 an MSW landfill having a design capacity less than 2.5 million megagrams by mass or 2.5 million cubic meters by volume must submit an initial design capacity report to the Administrator as provided in 40 C.F.R. §60.767(a). The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions must be documented and submitted with the report. Submittal of the initial design capacity report fulfills the requirements of this subpart except as provided for in paragraphs (a)(1) and (2) of 40 C.F.R. §60.762.

- a) The owner or operator must submit to the Administrator an amended design capacity report, as provided for in 40 C.F.R. §60.767(a)(3)
- b) When an increase in the maximum design capacity of a landfill exempted from the provisions of 40 C.F.R. §§ 60.762(b) through 60.769 on the basis of the design capacity exemption in paragraph (a) of 40 C.F.R. §60.762 results in a revised maximum design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the owner or operator must comply with the provisions of paragraph (b) of 40 C.F.R. §60.762.

[40 C.F.R. §60.762(a); 45CSR23§5.1]

4.1.2. Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, must either comply with paragraph (b)(2) of 40 C.F.R. §60.762 or calculate an NMOC emission rate for the landfill using the procedures specified in 40 C.F.R. §60.764. The NMOC emission rate must be recalculated annually, except as provided in § 60.767(b)(1)(ii). The owner or operator of an MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters is subject to part 70 or 71 permitting requirements.

- a) If the calculated NMOC emission rate is less than 34 megagrams per year, the owner or operator must:
 - 1. Submit an annual NMOC emission rate emission report to the Administrator, except as provided for in 40 C.F.R. §60.767(b)(1)(ii); and
 - 2. Recalculate the NMOC emission rate annually using the procedures specified in 40 C.F.R. §60.764(a)(1) until such time as the calculated NMOC emission rate is equal to or greater than 34 megagrams per year, or the landfill is closed.
 - i. If the calculated NMOC emission rate, upon initial calculation or annual recalculation required in paragraph (b) of 40 C.F.R. §60.762, is equal to or greater than 34 megagrams per year, the owner or operator must either: Comply with paragraph (b)(2) of 40 C.F.R. §60.762; calculate NMOC emissions using the next higher tier in 40 C.F.R. §60.764; or conduct a surface emission monitoring demonstration using the procedures specified in 40 C.F.R. §60.764(a)(6).
 - ii. If the landfill is permanently closed, a closure report must be submitted to the Administrator as provided for in 40 C.F.R. §60.767(e).

- 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 must either:
1. **Calculated NMOC Emission Rate.** Submit an initial or revised collection and control system design plan prepared by a professional engineer to the Administrator as specified in 40 C.F.R. §60.767(c) or (d); calculate NMOC emissions using the next higher tier in 40 C.F.R. §60.764; or conduct a surface emission monitoring demonstration using the procedures specified in 40 C.F.R. §60.764(a)(6). The collection and control system must meet the requirements in paragraphs (b)(2)(ii) and (iii) of 40 C.F.R. §60.762.
 2. **Collection system.** Install and start up a collection and control system that captures the gas generated within the landfill as required by paragraphs (b)(2)(ii)(C) or (D) and (b)(2)(iii) of 40 C.F.R. §60.762 within 30 months after:
 - i. The first annual report submitted under 40 C.F.R. 60 Subpart XXX or 40 C.F.R. part 62 in which the NMOC emission rate equals 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, as specified in 40 C.F.R. §60.767(c)(4); or
 - ii. 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 parts per million methane or greater as specified in 40 C.F.R. §60.767(c)(4)(iii).
 - iii. An active collection system must:
 - A. Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment;
 - B. Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade.
 - C. Collect gas at a sufficient extraction rate;
 - D. Be designed to minimize off-site migration of subsurface gas.
 - iv. A passive collection system must:
 - A. Comply with the provisions specified in paragraphs (b)(2)(ii)(C)(1), (2), and (3) of 40 C.F.R. §60.762.
 - B. Be installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners must be installed as required under 40 C.F.R. §258.40.
 3. **Control system.** Route all the collected gas to a control system that complies with the requirements in either paragraph (b)(2)(iii)(A), (B), or (C) of 40 C.F.R. §60.762.

- i. A non-enclosed flare designed and operated in accordance with the parameters established in 40 C.F.R. §60.18 except as noted in 40 C.F.R. §60.764(e); or
 - ii. A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume must be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in 40 C.F.R. §60.764(d). The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts that burn landfill gas for compliance with 40 C.F.R. 60 Subpart XXX.
 - A. If a boiler or process heater is used as the control device, the landfill gas stream must be introduced into the flame zone.
 - B. The control device must be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in 40 C.F.R. §60.766;
 - iii. 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 must be controlled according to either paragraph (b)(2)(iii)(A) or (B) of 40 C.F.R. §60.762.
 - iv. All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of paragraph (b)(2)(iii)(A) or (B) of 40 C.F.R. §60.762. For purposes of this subpart, atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of paragraph (b)(2)(iii)(A) or (B) of 40 C.F.R. §60.762.
4. **Operation.** Operate the collection and control device installed to comply with this subpart in accordance with the provisions of 40 C.F.R. §§60.763, 60.765, and 60.766; or the provisions of 40 C.F.R. §§63.1958, 63.1960, and 63.1961. Once the owner or operator begins to comply with the provisions of 40 C.F.R. §§63.1958, 63.1960, and 63.1961, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of 40 C.F.R. §§60.763, 60.765, and 60.766.
5. **Removal criteria.** The collection and control system may be capped, removed, or decommissioned if the following criteria are met:
- i. The landfill is a closed landfill (as defined in 40 C.F.R. §60.761). A closure report must be submitted to the Administrator as provided in 40 C.F.R. §60.767(e).
 - ii. The collection and control system has been in operation a minimum of 15 years or the landfill owner or operator demonstrates that the GCCS will be unable to operate for 15 years

due to declining gas flow.

- iii. Following the procedures specified in 40 C.F.R. §60.764(b), the calculated NMOC emission rate at the landfill is less than 34 megagrams per year on three successive test dates. The test dates must be no less than 90 days apart, and no more than 180 days apart.

[40 C.F.R. §60.762(b); 45CSR23§5.1]

- 4.1.3. For purposes of obtaining an operating permit under title V of the Clean Air Act, the owner or operator of an MSW landfill subject to this subpart with a design capacity less than 2.5 million megagrams or 2.5 million cubic meters is not subject to the requirement to obtain an operating permit for the landfill under part 70 or 71 of this chapter, unless the landfill is otherwise subject to either part 70 or 71. For purposes of submitting a timely application for an operating permit under part 70 or 71, the owner or operator of an MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters, and not otherwise subject to either part 70 or 71, becomes subject to the requirements of 40 C.F.R. §70.5(a)(1)(i) or §71.5(a)(1)(i), regardless of when the design capacity report is actually submitted, no later than:

- a) November 28, 2016 for MSW landfills that commenced construction, modification, or reconstruction after July 17, 2014 but before August 29, 2016;
- b) Ninety days after the date of commenced construction, modification, or reconstruction for MSW landfills that commence construction, modification, or reconstruction after August 29, 2016.

[40 C.F.R. §60.762(c); 45CSR23§5.1]

- 4.1.4. When an MSW landfill subject to this subpart is closed as defined in this subpart, the owner or operator is no longer subject to the requirement to maintain an operating permit under 40 C.F.R. part 70 or 71 for the landfill if the landfill is not otherwise subject to the requirements of either part 70 or 71 and if either of the following conditions are met:

- a) The landfill was never subject to the requirement for a control system under paragraph (b)(2) of 40 C.F.R. §60.762; or
- b) The owner or operator meets the condition for control system removal specified in paragraph (b)(2)(v) of 40 C.F.R. §60.762.

[40 C.F.R. §60.762(d); 45CSR23§5.1]

- 4.1.5. Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of 40 C.F.R. §60.762(b)(2) must:

- a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:
 - 1. 5 years or more if active; or
 - 2. 2 years or more if closed or at final grade;
- b) Operate the collection system with negative pressure at each wellhead except under the following conditions:

1. A fire or increased well temperature. The owner or operator must record instances when positive pressure occurs in efforts to avoid a fire. These records must be submitted with the annual reports as provided in 40 C.F.R. §60.767(g)(1);
 2. Use of a geomembrane or synthetic cover. The owner or operator must develop acceptable pressure limits in the design plan;
 3. A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes must be approved by the Administrator as specified in 40 C.F.R. §60.767(c);
- c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit). The owner or operator may establish a higher operating temperature value at a particular well. A higher operating value demonstration must be submitted to the Administrator for approval and must include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens. The demonstration must satisfy both criteria in order to be approved (i.e., neither causing fires nor killing methanogens is acceptable).
- d) Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator must conduct surface testing using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in 40 C.F.R. §60.765(d). The owner or operator must 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. Thus, the owner or operator must monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan must be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.
- e) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with 40 C.F.R. §60.762(b)(2)(iii). In the event the collection or control system is not operating, the gas mover system must be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere must be closed within 1 hour of the collection or control system not operating; and
- f) Operate and control system at all times when the collected gas is routed to the system.
- g) If monitoring demonstrates that the operational requirements in paragraphs (b), (c), or (d) of 40 C.F.R. §60.763 are not met, corrective action must be taken as specified in 40 C.F.R. §60.765(a)(3) and (5) or (c). If corrective actions are taken as specified in 40 C.F.R. §60.765, the monitored exceedance is not a violation of the operational requirements in this section.

[40 C.F.R. §60.763; 45CSR23§5.1]

4.1.6.

- a) After the installation and startup of a collection and control system in compliance with this subpart,

the owner or operator must calculate the NMOC emission rate for purposes of determining when the system can be capped, removed, or decommissioned as provided in 40 C.F.R. §60.762(b)(2)(v), using Equation 3:

$$M_{NMOC} = 1.89 * 10^{-3} Q_{LFG} C_{NMOC} \text{ (Eq. 3)}$$

Where:

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

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

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

1. The flow rate of landfill gas, Q_{LFG} , must be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control system using a gas flow measuring device calibrated according to the provisions of section 10 of Method 2E of appendix A of 40 C.F.R. 60.
2. The average NMOC concentration, C_{NMOC} , must be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25 or Method 25C. The sample location on the common header pipe must be before any condensate removal or other gas refining units. The landfill owner or operator must divide the NMOC concentration from Method 25 or Method 25C of appendix A of 40 C.F.R. 60 by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.
3. The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the Administrator.
 - i. Within 60 days after the date of completing each performance test (as defined in 40 C.F.R. §60.8), the owner or operator must submit the results of the performance test, including any associated fuel analyses, according to 40 C.F.R. §60.767(i)(1).
- b) When calculating emissions for Prevention of Significant Deterioration purposes, the owner or operator of each MSW landfill subject to the provisions of this subpart must estimate the NMOC emission rate for comparison to the Prevention of Significant Deterioration major source and significance levels in 40 C.F.R. §§51.166 or 52.21 using 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 in 40 C.F.R. §60.762(b)(2)(iii)(B), Method 25 or 25C (Method 25C may be used at the inlet only) of appendix A of 40 C.F.R. 60 must be used to determine compliance with the 98 weight-percent efficiency or the 20 parts per million by volume outlet concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by 40 C.F.R. §60.767(c)(2). Method 3, 3A, or 3C must be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), Method 25A should be used in place of Method 25. Method 18 may be used in conjunction with Method 25A on a limited basis (compound specific, e.g., methane) or Method 3C may be used to determine methane. The methane as carbon should be subtracted from the Method 25A total hydrocarbon value as carbon to give NMOC concentration as carbon. The landowner or operator must divide the NMOC concentration as carbon by 6 to convert from the C_{NMOC} as carbon to C_{NMOC} as hexane. Equation 4 must be used to calculate efficiency:

$$\text{Control Efficiency} = (NMOC_{in} - NMOC_{out}) / (NMOC_{in}) \text{ (Eq. 4)}$$

Where:

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

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

- d) For the performance test required in 40 C.F.R. §60.762(b)(2)(iii)(A), the net heating value of the combusted landfill gas as determined in 40 C.F.R. §60.18(f)(3) is calculated from the concentration of methane in the landfill gas as measured by Method 3C. A minimum of three 30-minute Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under 40 C.F.R. §60.18(f)(4).
1. Within 60 days after the date of completing each performance test (as defined in 40 C.F.R. §60.8), the owner or operator must submit the results of the performance tests, including any associated fuel analyses, required by 40 C.F.R. §60.764(b) or (d) according to 40 C.F.R. §60.767(i)(1).
[40 C.F.R. §§60.764(b), (c), (d), (e); 45CSR23§5.1]

4.1.7.

- a) Except as provided in 40 C.F.R. §60.767(c)(2), the specified methods in paragraphs (a)(1) through (6) of 40 C.F.R. §60.765 must be used to determine whether the gas collection system is in compliance with 40 C.F.R. §60.762(b)(2)(ii).
1. For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with 40 C.F.R. §60.762(b)(2)(ii)(C)(1), either Equation 5 or Equation 6 must be used. The methane generation rate constant (k) and methane generation potential (L_o) kinetic factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42) or other site specific values demonstrated to be appropriate and approved by the Administrator. If k has been determined as specified in 40 C.F.R. §60.764(a)(4), the value of k determined from the test must be used. A value of no more than 15 years must be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.
- i. For sites with unknown year-to-year solid waste acceptance rate, use Equation 5 below:

$$Q_m = 2L_oR(e^{-kc} - e^{-kt}) \text{ (Eq. 5)}$$

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, use Equation 6 below:

$$Q_M = \sum_{i=1}^n 2kL_oM_i(e^{-kt_i}) \text{ (Eq. 6)}$$

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. If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, Equation 5 or Equation 6 in paragraphs (a)(1)(i) and (ii) of 40 C.F.R. §60.765. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using Equation 5 or Equation 6 in paragraphs (a)(1)(i) or (ii) of 40 C.F.R. §60.765 or other methods must be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.
2. For the purposes of determining sufficient density of gas collectors for compliance with 40 C.F.R. §60.762(b)(2)(ii)(C)(2), the owner or operator must design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the Administrator, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.
3. For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with 40 C.F.R. §60.762(b)(2)(ii)(C)(3), the owner or operator must measure gauge pressure in the gas collection header applied to each individual well, monthly. If a positive pressure exists, action must be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under 40 C.F.R. §60.763(b). Any attempted corrective measure must not cause exceedances of other operational or performance standards.
- 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 must conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after positive pressure was first measured. The owner or operator must keep records according to 40 C.F.R. §60.768(e)(3).
- ii. If corrective actions cannot be fully implemented within 60 days following the positive pressure measurement for which the root cause analysis was required, the owner or operator must 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 positive pressure measurement. The owner or operator must submit the items listed in 40 C.F.R. §60.767(g)(7) as part of the next annual report. The owner or operator must keep records according to 40 C.F.R. §60.768(e)(4).

- iii. If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to 40 C.F.R. §60.767(g)(7) and 40 C.F.R. §60.767(j). The owner or operator must keep records according to 40 C.F.R. §60.768(e)(5).
- 4. [Reserved]
- 5. For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator must monitor each well monthly for temperature as provided in 40 C.F.R. §60.763(c). If a well exceeds the operating parameter for temperature, action must be initiated to correct the exceedance within 5 calendar days. Any attempted corrective measure must not cause exceedances of other operational or performance standards.
 - i. If a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit) cannot be achieved within 15 calendar days of the first measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit), the owner or operator must conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after a landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit) was first measured. The owner or operator must keep records according to 40 C.F.R. §60.768(e)(3).
 - ii. If corrective actions cannot be fully implemented within 60 days following the positive pressure or elevated temperature measurement for which the root cause analysis was required, the owner or operator must 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) or positive pressure. The owner or operator must submit the items listed in 40 C.F.R. §60.767(g)(7) as part of the next annual report. The owner or operator must keep records according to 40 C.F.R. §60.768(e)(4).
 - iii. If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to 40 C.F.R. §60.767(g)(7) and 40 C.F.R. §60.767(j). The owner or operator must keep records according to 40 C.F.R. §60.768(e)(5).
- 6. An owner or operator seeking to demonstrate compliance with 40 C.F.R. §60.762(b)(2)(ii)(C)(4) through the use of a collection system not conforming to the specifications provided in 40 C.F.R. §60.769 must provide information satisfactory to the Administrator as specified in § 60.767(c)(3) demonstrating that off-site migration is being controlled.
 - b) For purposes of compliance with 40 C.F.R. §60.763(a), each owner or operator of a controlled landfill must place each well or design component as specified in the approved design plan as provided in 40 C.F.R. §60.767(c). Each well must be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:
 - 1. Five (5) years or more if active; or
 - 2. Two (2) years or more if closed or at final grade.

- c) The following procedures must be used for compliance with the surface methane operational standard as provided in 40 C.F.R. §60.763(d).
1. After installation and startup of the gas collection system, the owner or operator must monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of 40 C.F.R. §60.765.
 2. The background concentration must be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.
 3. Surface emission monitoring must be performed in accordance with section 8.3.1 of Method 21 of appendix A of 40 C.F.R. 60, except that the probe inlet must be placed within 5 to 10 centimeters of the ground. Monitoring must be performed during typical meteorological conditions.
 4. Any reading of 500 parts per million or more above background at any location must be recorded as a monitored exceedance and the actions specified in paragraphs (c)(4)(i) through (v) of 40 C.F.R. §60.765 must be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of 40 C.F.R. §60.763(d).
 - i. The location of each monitored exceedance must be marked and the location and concentration recorded.
 - ii. Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance must be made and the location must be re-monitored within 10 calendar days of detecting the exceedance.
 - iii. If the re-monitoring of the location shows a second exceedance, additional corrective action must be taken and the location must be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in paragraph (c)(4)(v) of 40 C.F.R. §60.765 must be taken, and no further monitoring of that location is required until the action specified in paragraph (c)(4)(v) of 40 C.F.R. §60.765 has been taken.
 - iv. Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring specified in paragraph (c)(4)(ii) or (iii) of 40 C.F.R. §60.765 must be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in paragraph (c)(4)(iii) or (v) of 40 C.F.R. §60.765 must be taken.
 - v. For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other

collection device must be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the Administrator for approval.

5. The owner or operator must implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.
- d) Each owner or operator seeking to comply with the provisions in paragraph (c) of 40 C.F.R. §60.765 or 40 C.F.R. §60.764(a)(6) must comply with the following instrumentation specifications and procedures for surface emission monitoring devices:
1. The portable analyzer must meet the instrument specifications provided in section 6 of Method 21 of appendix A of 40 C.F.R. 60, except that “methane” replaces all references to “VOC”.
 2. The calibration gas must be methane, diluted to a nominal concentration of 500 parts per million in air.
 3. To meet the performance evaluation requirements in section 8.1 of Method 21 of appendix A of 40 C.F.R. 60, the instrument evaluation procedures of section 8.1 of Method 21 of appendix A of 40 C.F.R. 60 must be used.
 4. The calibration procedures provided in sections 8 and 10 of Method 21 of appendix A of 40 C.F.R. 60 must be followed immediately before commencing a surface monitoring survey.
- e) The provisions of this subpart apply at all times, including periods of startup, shutdown or malfunction. During periods of startup, shutdown, and malfunction, you must comply with the work practice specified in 40 C.F.R. §60.763(e) in lieu of the compliance provisions in 40 C.F.R. §60.765. **[40 C.F.R. §60.765; 45CSR23§5.1]**

4.2. Monitoring Requirements

4.2.1. Except as provided in 40 C.F.R. §60.767(c)(2):

- a) Each owner or operator seeking to comply with 40 C.F.R. §60.762(b)(2)(ii)(C) for an active gas collection system must install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:
 - 1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in 40 C.F.R. §60.765(a)(3); and
 - 2) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as follows:
 - i. The nitrogen level must be determined using Method 3C, unless an alternative test method is established as allowed by 40 C.F.R. §60.767(c)(2).
 - ii. Unless an alternative test method is established as allowed by 40 C.F.R. §60.767(c)(2), the oxygen level must be determined by an oxygen meter using Method 3A, 3C, or ASTM D6522-11 (incorporated by reference, see 40 C.F.R. §60.17). Determine the oxygen level by an oxygen

meter using Method 3A, 3C, or ASTM D6522-11 (if sample location is prior to combustion) except that:

- A. The span must be set between 10 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;
 - E. The allowable sample bias, zero drift, and calibration drift are ± 10 percent.
- iii. A portable gas composition analyzer may be used to monitor the oxygen levels provided:
- A. The analyzer is calibrated; and
 - B. The analyzer meets all quality assurance and quality control requirements for Method 3A or ASTM D6522-11 (incorporated by reference, see 40 C.F.R. §60.17).
- 3) Monitor temperature of the landfill gas on a monthly basis as provided in 40 C.F.R. §60.765(a)(5). The temperature measuring device must be calibrated annually using the procedure in 40 CFR part 60, appendix A-1, Method 2, section 10.3 such that a minimum of two temperature points, bracket within 10 percent of all landfill absolute temperature measurements or two fixed points of ice bath and boiling water, corrected for barometric pressure, are used.
- b) Each owner or operator seeking to comply with 40 C.F.R. §60.762(b)(2)(iii) using an enclosed combustor must calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:
- 1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ± 1 percent of the temperature being measured expressed in degrees Celsius or ± 0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.
 - 2) A device that records flow to the control device and bypass of the control device (if applicable). The owner or operator must:
 - i. Install, calibrate, and maintain a gas flow rate measuring device that must record the flow to the control device at least every 15 minutes; and
 - ii. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.
- c) Each owner or operator seeking to comply with 40 C.F.R. §60.762(b)(2)(iii) using a non-enclosed flare must install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

- 1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame.
- 2) A device that records flow to the flare and bypass of the flare (if applicable). The owner or operator must:
 - 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. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.
- d) Each owner or operator seeking to demonstrate compliance with 40 C.F.R. §60.762(b)(2)(iii) using a device other than a non-enclosed flare or an enclosed combustor or a treatment system must provide information satisfactory to the Administrator as provided in 40 C.F.R. §60.767(c)(2) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator must review the information and either approve it, or request that additional information be submitted. The Administrator may specify additional appropriate monitoring procedures.
- e) Each owner or operator seeking to install a collection system that does not meet the specifications in 40 C.F.R. §60.769 or seeking to monitor alternative parameters to those required by 40 C.F.R. §§60.763 through 60.766 must provide information satisfactory to the Administrator as provided in 40 C.F.R. §60.767(c)(2) and (3) describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator may specify additional appropriate monitoring procedures.
- f) Each owner or operator seeking to demonstrate compliance with the 500 parts per million surface methane operational standard in 40 C.F.R. §60.763(d) must monitor surface concentrations of methane according to the procedures in 40 C.F.R. §60.765(c) and the instrument specifications in 40 C.F.R. §60.765(d). Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.
- g) Each owner or operator seeking to demonstrate compliance with 40 C.F.R. §60.762(b)(2)(iii) using a landfill gas treatment system must maintain and operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan required in 40 C.F.R. §60.768(b)(5)(ii) and must calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to the treatment system and bypass of the treatment system (if applicable). The owner or operator must:
 - 1) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and
 - 2) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once

every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

- h) The monitoring requirements of paragraphs (b), (c) (d) and (g) of 40 C.F.R. §60.766 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. You are required to complete monitoring system repairs in response to monitoring system malfunctions and to return the monitoring system to operation as expeditiously as practicable.

[40 C.F.R. §60.766; 45CSR23§5.1]

4.2.2.

- a) Each owner or operator seeking to comply with 40 C.F.R. §60.762(b)(2)(i) must site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the Administrator as provided in 40 C.F.R. §60.767(c)(2) and (3):
1. The collection devices within the interior must be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues must be addressed in the design: Depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, resistance to the refuse decomposition heat, and ability to isolate individual components or sections for repair or troubleshooting without shutting down entire collection system.
 2. The sufficient density of gas collection devices determined in paragraph (a)(1) of 40 C.F.R. §60.769 must address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.
 3. The placement of gas collection devices determined in paragraph (a)(1) of 40 C.F.R. §60.769 must control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (ii) of 40 C.F.R. §60.769.
 - i. Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under 40 C.F.R. §60.768(d). The documentation must provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and must be provided to the Administrator upon request.
 - ii. Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material must be documented and provided to the Administrator upon request. A separate NMOC emissions estimate must be made for each section proposed for exclusion, and the sum of all such sections must be compared to the NMOC emissions estimate for the entire landfill.
- A. The NMOC emissions from each section proposed for exclusion must be computed using Equation 7:

$$Q_i = 2k L_o M_i (e^{-kt_i})(C_{NMOC})(3.6 \times 10^{-9}) \text{ (Eq. 7)}$$

Where:

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

k = Methane generation rate constant, year⁻¹.

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

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

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

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

3.6×10^{-9} = Conversion factor.

- B. If the owner/operator is proposing to exclude, or cease gas collection and control from, nonproductive physically separated (e.g., separately lined) closed areas that already have gas collection systems, NMOC emissions from each physically separated closed area must be computed using either Equation 3 in 40 C.F.R. §60.764(b) or Equation 7 in paragraph (a)(3)(ii)(A) of 40 C.F.R. §60.769.
- iii. The values for k and C_{NMOC} determined in field testing must be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (this distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k , L_o and C_{NMOC} provided in 40 C.F.R. §60.764(a)(1) or the alternative values from 40 C.F.R. §60.764(a)(5) must be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in paragraph (a)(3)(i) of 40 C.F.R. §60.769.
- b) Each owner or operator seeking to comply with 40 C.F.R. §60.762(b)(2)(ii)(A) construct the gas collection devices using the following equipment or procedures:
1. The landfill gas extraction components must be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: Convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system must extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors must be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations must be situated with regard to the need to prevent excessive air infiltration.
 2. Vertical wells must be placed so as not to endanger underlying liners and must address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors must be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices must be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.
 3. Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly must include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices must be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

- c) Each owner or operator seeking to comply with 40 C.F.R. §60.762(b)(2)(iii) must convey the landfill gas to a control system in compliance with 40 C.F.R. §60.762(b)(2)(iii) through the collection header pipe(s). The gas mover equipment must be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:
 1. For existing collection systems, the flow data must be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (c)(2) of 40 C.F.R. §60.769 must be used.
 2. For new collection systems, the maximum flow rate must be in accordance with 40 C.F.R. §60.765(a)(1).

[40 C.F.R. §60.769; 45CSR23§5.1]

4.3. Testing Requirements

4.3.1.

- a) **NMOC emission rate.** The landfill owner or operator must calculate the NMOC emission rate using either Equation 1 provided in paragraph (a)(1)(i) of 40 C.F.R. §60.764 or Equation 2 provided in paragraph (a)(1)(ii) of 40 C.F.R. §60.764. Both Equation 1 and Equation 2 may be used if the actual year-to-year solid waste acceptance rate is known, as specified in paragraph (a)(1)(i) of 40 C.F.R. §60.764, for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown, as specified in paragraph (a)(1)(ii) of 40 C.F.R. §60.764, for part of the life of the landfill. The values to be used in both Equation 1 and Equation 2 are 0.05 per year for k, 170 cubic meters per megagram for L_o , and 4,000 parts per million by volume as hexane for the C_{NMOC} . For landfills located in geographical areas with a 30-year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorologic site, the k value to be used is 0.02 per year.
 1.
 - i. Equation 1 must be used if the actual year-to-year solid waste acceptance rate is known.

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

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 ith section, megagrams.

t_i = Age of the ith section, years.

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

$3.6 * 10^{-9}$ = Conversion factor

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

2.

- i. Equation 2 must be used if the actual year-to-year solid waste acceptance rate is unknown.

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

Where:

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

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

R = Average annual acceptance rate, megagrams per year.

k = Methane generation rate constant, year⁻¹.

t = Age of landfill, years.

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

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

3.6×10^{-9} = Conversion factor.

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

- b) **Tier 1.** The owner or operator must compare the calculated NMOC mass emission rate to the standard of 34 megagrams per year.

- 1. If the NMOC emission rate calculated in paragraph (a)(1) of 40 C.F.R. §60.764 is less than 34 megagrams per year, then the landfill owner or operator must submit an NMOC emission rate report according to 40 C.F.R. §60.767(b), and must recalculate the NMOC mass emission rate annually as required under 40 C.F.R. §60.762(b).
- 2. If the calculated NMOC emission rate as calculated in paragraph (a)(1) of 40 C.F.R. §60.764 is equal to or greater than 34 megagrams per year, then the landfill owner must either:
 - i. Submit a gas collection and control system design plan within 1 year as specified in 40 C.F.R. §60.767(c) and install and operate a gas collection and control system within 30 months according to 40 C.F.R. §60.762(b)(2)(ii) and (iii);
 - ii. Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the Tier 2 procedures provided in paragraph (a)(3) of 40 C.F.R. §60.764 ; or
 - iii. Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the Tier 3 procedures provided in paragraph (a)(4) of 40 C.F.R. §60.764.

- c) **Tier 2.** The landfill owner or operator must determine the site-specific NMOC concentration using the following sampling procedure. The landfill owner or operator must install at least two sample probes per hectare, evenly distributed over the landfill surface that has retained waste for at least 2 years. If the landfill is larger than 25 hectares in area, only 50 samples are required. The probes should be evenly distributed across the sample area. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator must collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using Method 25 or 25C of 40 C.F.R. 60 appendix A. Taking composite samples from different probes into a single cylinder is allowed; however, equal sample volumes must be taken from each probe. For each composite, the sampling rate, collection times, beginning and ending cylinder vacuums, or alternative volume measurements must be recorded to verify that composite volumes are equal. Composite sample volumes should not be less than one liter unless evidence can be provided to substantiate the accuracy of smaller volumes. Terminate compositing before the cylinder approaches ambient pressure where measurement accuracy diminishes. If more than the required number of samples are taken, all samples must be used in the analysis. The landfill owner or operator must divide the NMOC concentration from Method 25 or 25C 40 C.F.R. 60 appendix A by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane. If the landfill has an active or passive gas removal system in place, Method 25 or 25C samples may be collected from these systems instead of surface probes provided the removal system can be shown to provide sampling as representative as the two sampling probe per hectare requirement. For active collection systems, samples may be collected from the common header pipe. The sample location on the common header pipe must be before any gas moving, condensate removal, or treatment system equipment. For active collection systems, a minimum of three samples must be collected from the header pipe.
1. Within 60 days after the date of completing each performance test (as defined in 40 C.F.R. §60.8), the owner or operator must submit the results according to 40 C.F.R. §60.767(i)(1).
 2. The landfill owner or operator must recalculate the NMOC mass emission rate using Equation 1 or Equation 2 provided in paragraph (a)(1)(i) or (a)(1)(ii) of 40 C.F.R. §60.764 and using the average site-specific NMOC concentration from the collected samples instead of the default value provided in paragraph (a)(1) of 40 C.F.R. §60.764.
 3. If the resulting NMOC mass emission rate is less than 34 megagrams per year, then the owner or operator must submit a periodic estimate of NMOC emissions in an NMOC emission rate report according to 40 C.F.R. §60.767(b)(1), and must recalculate the NMOC mass emission rate annually as required under 40 C.F.R. §60.762(b). The site-specific NMOC concentration must be retested every 5 years using the methods specified in this section.
 4. If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration is equal to or greater than 34 megagrams per year, the landfill owner or operator must either:
 - i. Submit a gas collection and control system design plan within 1 year as specified in 40 C.F.R. §60.767(c) and install and operate a gas collection and control system within 30 months according to 40 C.F.R. §60.762(b)(2)(ii) and (iii);
 - ii. Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the Tier 3 procedures specified in paragraph (a)(4) of 40 C.F.R. §60.764; or
 - iii. Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in paragraph (a)(6) of 40 C.F.R. §60.764.

- d) **Tier 3.** The site-specific methane generation rate constant must be determined using the procedures provided in Method 2E of appendix A of 40 C.F.R. 60. The landfill owner or operator must estimate the NMOC mass emission rate using Equation 1 or Equation 2 in paragraph (a)(1)(i) or (ii) of 40 C.F.R. §60.764 and using a site-specific methane generation rate constant, and the site-specific NMOC concentration as determined in paragraph (a)(3) of 40 C.F.R. §60.764 instead of the default values provided in paragraph (a)(1) of 40 C.F.R. §60.764. The landfill owner or operator must compare the resulting NMOC mass emission rate to the standard of 34 megagrams per year.
1. If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration and Tier 3 site-specific methane generation rate is equal to or greater than 34 megagrams per year, the owner or operator must either:
 - i. Submit a gas collection and control system design plan within 1 year as specified in 40 C.F.R. §60.767(c) and install and operate a gas collection and control system within 30 months according to 40 C.F.R. §60.762(b)(2)(ii) and (iii); or
 - ii. Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in paragraph (a) (6) of 40 C.F.R. §60.764.
 2. If the NMOC mass emission rate is less than 34 megagrams per year, then the owner or operator must recalculate the NMOC mass emission rate annually using Equation 1 or Equation 2 in paragraph (a)(1) of 40 C.F.R. §60.764 and using the site-specific Tier 2 NMOC concentration and Tier 3 methane generation rate constant and submit a periodic NMOC emission rate report as provided in 40 C.F.R. §60.767(b)(1). The calculation of the methane generation rate constant is performed only once, and the value obtained from this test must be used in all subsequent annual NMOC emission rate calculations.
- e) **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 in paragraphs (a)(3) and (4) of 40 C.F.R. §60.764 if the method has been approved by the Administrator.
- f) **Tier 4.** The landfill owner or operator must demonstrate that surface methane emissions are below 500 parts per million. Surface emission monitoring must be conducted on a quarterly basis using the following procedures. Tier 4 is allowed only if the landfill owner or operator can demonstrate that NMOC emissions are greater than or equal to 34 Mg/yr but less than 50 Mg/yr using Tier 1 or Tier 2. If both Tier 1 and Tier 2 indicate NMOC emissions are 50 Mg/yr or greater, then Tier 4 cannot be used. In addition, the landfill must meet the criteria in paragraph (a)(6)(viii) of 40 C.F.R. §60.764.
1. The owner or operator must measure surface concentrations of methane along the entire perimeter of the landfill and along a pattern that traverses the landfill at no more than 30-meter intervals using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in 40 C.F.R. §60.765(d).
 2. The background concentration must be determined by moving the probe inlet upwind and downwind at least 30 meters from the waste mass boundary of the landfill.
 3. Surface emission monitoring must be performed in accordance with section 8.3.1 of Method 21 of appendix A of 40 C.F.R. 60, except that the probe inlet must be placed no more than 5 centimeters above the landfill surface; the constant measurement of distance above the surface should be based

on a mechanical device such as with a wheel on a pole, except as described in paragraph (a)(6)(iii)(A) of 40 C.F.R. §60.764.

- i. The owner or operator must use a wind barrier, similar to a funnel, when onsite average wind speed exceeds 4 miles per hour or 2 meters per second or gust exceeding 10 miles per hour. Average on-site wind speed must also be determined in an open area at 5-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 must surround the SEM monitor, and must be placed on the ground, to ensure wind turbulence is blocked. SEM cannot be conducted if average wind speed exceeds 25 miles per hour.
 - ii. Landfill surface areas where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover, and all cover penetrations must also be monitored using a device meeting the specifications provided in 40 C.F.R. §60.765(d).
4. Each owner or operator seeking to comply with Tier 4 provisions in paragraph (a) (6) of 40 C.F.R. §60.764 must maintain records of surface emissions monitoring as provided in 40 C.F.R. §60.768(g) and submit a Tier 4 surface emissions report as provided in 40 C.F.R. §60.767(c)(4)(iii).
 5. If there is any measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator must submit a gas collection and control system design plan within 1 year of the first measured concentration of methane of 500 parts per million or greater from the surface of the landfill according to 40 C.F.R. §60.767(c) and install and operate a gas collection and control system according to 40 C.F.R. §60.762(b)(2)(ii) and (iii) 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.
 6. If after four consecutive quarterly monitoring periods at a landfill, other than a closed landfill, there is no measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator must continue quarterly surface emission monitoring using the methods specified in this section.
 7. If after four consecutive quarterly monitoring periods at a closed landfill there is no measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator must conduct annual surface emission monitoring using the methods specified in this section.
 8. If a landfill has installed and operates a collection and control system that is not required by this subpart, then the collection and control system must meet the following criteria:
 - i. The gas collection and control system must have operated for 6,570 out of 8,760 hours preceding the Tier 4 surface emissions monitoring demonstration.
 - ii. During the Tier 4 surface emissions monitoring demonstration, the gas collection and control system must operate as it normally would to collect and control as much landfill gas as possible.

[40 C.F.R. §60.764(a); 45CSR23§5.1]

4.4. Recordkeeping Requirements

4.4.1.

- a) Except as provided in 40 C.F.R. §60.767(c)(2), each owner or operator of an MSW landfill subject to the provisions of 40 C.F.R. §60.762(b)(2)(ii) and (iii) must keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report that triggered 40 C.F.R. §60.762(b), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.
- b) Except as provided in 40 C.F.R. §60.767(c)(2), each owner or operator of a controlled landfill must keep up-to-date, readily accessible records for the life of the control system equipment of the data listed in paragraphs (b)(1) through (5) of 40 C.F.R. §60.768 as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring must be maintained for a minimum of 5 years. Records of the control device vendor specifications must be maintained until removal.
 1. Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with 40 C.F.R. §60.762(b)(2)(ii):
 - i. The maximum expected gas generation flow rate as calculated in 40 C.F.R. §60.765(a)(1). The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the Administrator.
 - ii. The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in 40 C.F.R. §60.769(a)(1).
 2. Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with 40 C.F.R. §60.762(b)(2)(iii) through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts:
 - i. The average temperature measured at least every 15 minutes and averaged over the same time period of the performance test.
 - ii. The percent reduction of NMOC determined as specified in 40 C.F.R. §60.762(b)(2)(iii)(B) achieved by the control device.
 3. Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with 40 C.F.R. §60.762(b)(2)(iii)(B)(1) through use of a boiler or process heater of any size: A description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing.
 4. Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with 40 C.F.R. §60.762(b)(2)(iii)(A) through use of a non-enclosed flare, the flare type (i.e., steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in 40 C.F.R. §60.18; continuous records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame of the flare flame is absent.

5. Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with 40 C.F.R. §60.762(b)(2)(iii) through use of a landfill gas treatment system:
 - i. **Bypass records.** Records of the flow of landfill gas to, and bypass of, the treatment system.
 - ii. **Site-specific treatment monitoring plan,** to include:
 - A. Monitoring records of parameters that are 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, records should 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.
 - B. 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.
 - C. Documentation of the monitoring methods and ranges, along with justification for their use.
 - D. Identify who is responsible (by job title) for data collection.
 - E. Processes and methods used to collect the necessary data.
 - F. Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems.
- c) Except as provided in 40 C.F.R. §60.767(c)(2), each owner or operator of a controlled landfill subject to the provisions of this subpart must keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in 40 C.F.R. §60.766 as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.
 1. The following constitute exceedances that must be recorded and reported under 40 C.F.R. §60.767(g):
 - i. For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal units per hour) or greater, all 3-hour periods of operation during which the average temperature was more than 28 degrees Celsius (82 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with 40 C.F.R. §60.762(b)(2)(iii) was determined.
 - ii. For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under paragraph (b)(3) of 40 C.F.R. §60.768.
 2. Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible continuous records of the indication of flow to the control system and the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under 40 C.F.R. §60.766.

3. Each owner or operator subject to the provisions of this subpart who uses a boiler or process heater with a design heat input capacity of 44 megawatts or greater to comply with 40 C.F.R. §60.762(b)(2)(iii) must keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. (Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other state, local, tribal, or federal regulatory requirements.)
 4. Each owner or operator seeking to comply with the provisions of this subpart by use of a non-enclosed flare must keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under 40 C.F.R. §60.766(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.
 5. Each owner or operator of a landfill seeking to comply with 40 C.F.R. §60.762(b)(2) using an active collection system designed in accordance with 40 C.F.R. §60.762(b)(2)(ii) must keep records of periods when the collection system or control device is not operating.
- d) Except as provided in 40 C.F.R. §60.767(c)(2), each owner or operator subject to the provisions of this subpart must keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.
1. Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under 40 C.F.R. §60.765(b).
 2. Each owner or operator subject to the provisions of this subpart must keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in 40 C.F.R. §60.769(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in 40 C.F.R. §60.769(a)(3)(ii).
- e) Except as provided in 40 C.F.R. §60.767(c)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of the items in paragraphs (e)(1) through (5) of 40 C.F.R. §60.768. Each owner or operator that chooses to comply with the provisions in 40 C.F.R. §§63.1958, 63.1960, and 63.1961 of this chapter, as allowed at 40 C.F.R. §60.762(b)(2)(iv), must keep the records in paragraph (e)(6) of 40 C.F.R. §60.768 and must keep records according to 40 C.F.R. §§63.1983(e)(1) through (5) in lieu of paragraphs (e)(1) through (5) of 40 C.F.R. §60.768.
1. All collection and control system exceedances of the operational standards in 40 C.F.R. §60.763, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.
 2. Each owner or operator subject to the provisions of this subpart must also keep records of 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 5 percent.
 3. For any root cause analysis for which corrective actions are required in 40 C.F.R. §60.765(a)(3)(i) or (a)(5)(i), keep a record of 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.

4. For any root cause analysis for which corrective actions are required in 40 C.F.R. §60.765(a)(3)(ii) or (a)(5)(ii), keep a record of 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.
 5. For any root cause analysis for which corrective actions are required in 40 C.F.R. §60.765(a)(3)(iii) or (a)(5)(iii), keep a record of 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 regulatory agency.
 6. Each owner or operator that chooses to comply with the provisions in 40 C.F.R. §§63.1958, 63.1960, and 63.1961 of this chapter, as allowed at 40 C.F.R. §60.762(b)(2)(iv), must keep records of the date upon which the owner or operator started complying with the provisions in 40 C.F.R. §§63.1958, 63.1960, and 63.1961.
- f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, as provided in the definition of “design capacity”, must keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.
- g) Landfill owners or operators seeking to demonstrate that site-specific surface methane emissions are below 500 parts per million by conducting surface emission monitoring under the Tier 4 procedures specified in 40 C.F.R. §60.764(a)(6) must keep for at least 5 years up-to-date, readily accessible records of all surface emissions monitoring and information related to monitoring instrument calibrations conducted according to sections 8 and 10 of Method 21 of appendix A of 40 C.F.R. 60, including all of the following items:
1. Calibration records:
 - i. Date of calibration and initials of operator performing the calibration.
 - ii. Calibration gas cylinder identification, certification date, and certified concentration.
 - iii. Instrument scale(s) used.
 - iv. A description of any corrective action taken if the meter readout could not be adjusted to correspond to the calibration gas value.
 - v. If an owner or operator makes their own calibration gas, a description of the procedure used.
 2. Digital photographs of the instrument setup, including the wind barrier. The photographs must be time and date-stamped and taken at the first sampling location prior to sampling and at the last sampling location after sampling at the end of each sampling day, for the duration of the Tier 4 monitoring demonstration.

3. Timestamp of each surface scan reading:
 - i. Timestamp should be detailed to the nearest second, based on when the sample collection begins.
 - ii. 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).
4. Location of each surface scan reading. The owner or operator must determine the coordinates using an instrument with an accuracy of at least 4 meters. Coordinates must be in decimal degrees with at least five decimal places.
5. Monitored methane concentration (parts per million) of each reading.
6. Background methane concentration (parts per million) after each instrument calibration test.
7. Adjusted methane concentration using most recent calibration (parts per million).
8. For readings taken at each surface penetration, the unique identification location label matching the label specified in paragraph (d) of 40 C.F.R. §60.768
9. Records of the operating hours of the gas collection system for each destruction device.
- h) Except as provided in 40 C.F.R. §60.767(c)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of all collection and control system monitoring data for parameters measured in 40 C.F.R. §60.766(a)(1), (2), and (3).
- i) Any records required to be maintained by this subpart that are submitted electronically via the EPA's CDX may be maintained in electronic format.
- j) For each owner or operator reporting leachate or other liquids addition under 40 C.F.R. §60.767(k), 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 leachate or liquids were applied.

[40 C.F.R. §60.768; 45CSR23§5.1]

4.5. Reporting Requirements

4.5.1.

- a) **Design capacity report.** Each owner or operator subject to the requirements of this subpart must submit an initial design capacity report to the Administrator.
 1. **Submission.** The initial design capacity report fulfills the requirements of the notification of the date construction is commenced as required by 40 C.F.R. §60.7(a)(1) and must be submitted no later than:
 - i. November 28, 2016, for landfills that commenced construction, modification, or reconstruction after July 17, 2014 but before August 29, 2016; or

- ii. Ninety days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, the modification, or reconstruction after August 29, 2016.
 2. **Initial design capacity report.** The initial design capacity report must contain the following information:
 - i. A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the permit issued by the state, local, or tribal agency responsible for regulating the landfill.
 - ii. The maximum design capacity of the landfill. Where the maximum design capacity is specified in the permit issued by the state, local, or tribal agency responsible for regulating the landfill, a copy of the permit specifying the maximum design capacity may be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity must be calculated using good engineering practices. The calculations must be provided, along with the relevant parameters as part of the report. The landfill 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 its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation must include a site-specific density, which must be recalculated annually. Any density conversions must be documented and submitted with the design capacity report. The state, tribal, local agency or Administrator may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.
 3. **Amended design capacity report.** An amended design capacity report must be submitted to the Administrator providing notification of an increase in the design capacity of the landfill, within 90 days of an increase in the maximum design capacity of the landfill to meet or exceed 2.5 million megagrams and 2.5 million cubic meters. This increase in design capacity may result from an increase in the permitted volume of the landfill or an increase in the density as documented in the annual recalculation required in 40 C.F.R. §60.768(f).
- b) **NMOC emission rate report.** Each owner or operator subject to the requirements of this subpart must submit an NMOC emission rate report following the procedure specified in paragraph (i)(2) of 40 C.F.R. §60.767 to the Administrator initially and annually thereafter, except as provided for in paragraph (b)(1)(ii) of 40 C.F.R. §60.767. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate.
 1. The NMOC emission rate report must contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in 40 C.F.R. §60.764(a) or (b), as applicable.
 - i. The initial NMOC emission rate report may be combined with the initial design capacity report required in paragraph (a) of 40 C.F.R. §60.767 and must be submitted no later than indicated in paragraphs (b)(1)(i)(A) and (B) of 40 C.F.R. §60.767. Subsequent NMOC emission rate reports must be submitted annually thereafter, except as provided for in paragraph (b)(1)(ii) of 40 C.F.R. §60.767.
 - A. November 28, 2016, for landfills that commenced construction, modification, or reconstruction after July 17, 2014, but before August 29, 2016, or

- B. Ninety days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction after August 29, 2016.
- ii. If the estimated NMOC emission rate as reported in the annual report to the Administrator is less than 34 megagrams per year in each of the next 5 consecutive years, the owner or operator may elect to submit, following the procedure specified in paragraph (i)(2) of 40 C.F.R. §60.767, an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate must include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based must be provided to the Administrator. This estimate must be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised 5-year estimate must be submitted to the Administrator. The revised estimate must cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.
- 2. The NMOC emission rate report must include all the data, calculations, sample reports, and measurements used to estimate the annual or 5-year emissions.
- 3. Each owner or operator subject to the requirements of this subpart is exempted from the requirements to submit an NMOC emission rate report, after installing a collection and control system that complies with 40 C.F.R. §60.762(b)(2), during such time as the collection and control system is in operation and in compliance with 40 C.F.R. §§60.763 and 60.765.
- c) **Collection and control system design plan.** Each owner or operator subject to the provisions of 40 C.F.R. §60.762(b)(2) must submit a collection and control system design plan to the Administrator for approval according to the schedule in paragraph (c)(4) of 40 C.F.R. §60.767. The collection and control system design plan must be prepared and approved by a professional engineer and must meet the following requirements:
 - 1. The collection and control system as described in the design plan must meet the design requirements in 40 C.F.R. §60.762(b)(2).
 - 2. The collection and control system design plan must include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of 40 C.F.R. §§60.763 through 60.768 proposed by the owner or operator.
 - 3. The collection and control system design plan must either conform with specifications for active collection systems in 40 C.F.R. §60.769 or include a demonstration to the Administrator's satisfaction of the sufficiency of the alternative provisions to 40 C.F.R. §60.769.
 - 4. Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters must submit a collection and control system design plan to the Administrator for approval within 1 year of the first NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year, except as follows:
 - i. If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in 40 C.F.R. §60.764(a)(3) and the resulting rate is less than

34 megagrams per year, annual periodic reporting must be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated emission rate is equal to or greater than 34 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated emission rate based on NMOC sampling and analysis, must be submitted, following the procedures in paragraph (i)(2) of 40 C.F.R. §60.767, within 180 days of the first calculated exceedance of 34 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 , as provided in Tier 3 in 40 C.F.R. §60.764(a)(4), and the resulting NMOC emission rate is less than 34 Mg/yr, annual periodic reporting must be resumed. The resulting site-specific methane generation rate constant k must be used in the emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of 40 C.F.R. §60.764(a)(4) and the resulting site-specific methane generation rate constant k must be submitted, following the procedure specified in paragraph (i)(2) of 40 C.F.R. §60.767, to the Administrator within 1 year of the first calculated emission rate equaling or exceeding 34 megagrams per year.
- iii. If the owner or operator elects to demonstrate that site-specific surface methane emissions are below 500 parts per million methane, based on the provisions of 40 C.F.R. §60.764(a)(6), then the owner or operator must submit annually a Tier 4 surface emissions report as specified in this paragraph following the procedure specified in paragraph (i)(2) of 40 C.F.R. §60.767 until a surface emissions readings of 500 parts per million methane or greater is found. If the Tier 4 surface emissions report shows no surface emissions readings of 500 parts per million methane or greater for four consecutive quarters at a closed landfill, then the landfill owner or operator may reduce Tier 4 monitoring from a quarterly to an annual frequency. The Administrator may request such additional information as may be necessary to verify the reported instantaneous surface emission readings. The Tier 4 surface emissions report must clearly identify the location, date and time (to nearest second), average wind speeds including wind gusts, and reading (in parts per million) of any value 500 parts per million methane or greater, other than non-repeatable, momentary readings. For location, you must determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places. The Tier 4 surface emission report must 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.
 - A. The initial Tier 4 surface emissions report must be submitted annually, starting 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 parts per million methane, and following the procedure specified in paragraph (i)(2) of 40 C.F.R. §60.767.
 - B. The Tier 4 surface emissions report must be submitted within 1 year of the first measured surface exceedance of 500 parts per million methane, following the procedure specified in paragraph (i)(2) of 40 C.F.R. §60.767.
- 5. The landfill owner or operator must notify the Administrator that the design plan is completed and submit a copy of the plan's signature page. The Administrator has 90 days to decide whether the design plan should be submitted for review. If the Administrator chooses to review the plan, the approval process continues as described in paragraph (c)(6) of 40 C.F.R. §60.767. However, if the Administrator indicates that submission is not required or does not respond within 90 days, the

landfill owner or operator can continue to implement the plan with the recognition that the owner or operator is proceeding at their own risk. In the event that the design plan is required to be modified to obtain approval, the owner or operator must take any steps necessary to conform any prior actions to the approved design plan and any failure to do so could result in an enforcement action.

6. Upon receipt of an initial or revised design plan, the Administrator must review the information submitted under paragraphs (c)(1) through (3) of 40 C.F.R. §60.767 and either approve it, disapprove it, or request that additional information be submitted. Because of the many site-specific factors involved with landfill gas system design, alternative systems may be necessary. A wide variety of system designs are possible, such as vertical wells, combination horizontal and vertical collection systems, or horizontal trenches only, leachate collection components, and passive systems. If the Administrator 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 they would be proceeding at their own risk.
 7. If the owner or operator chooses to demonstrate compliance with the emission control requirements of this subpart using a treatment system as defined in this subpart, then the owner or operator must prepare a site-specific treatment system monitoring plan as specified in 40 C.F.R. §60.768(b)(5).
- d) **Revised design plan.** The owner or operator who has already been required to submit a design plan under paragraph (c) of 40 C.F.R. §60.767, 40 C.F.R. 60 subpart WWW, or a Federal plan or EPA-approved and effective state plan or tribal plan that implements subparts Cc or Cf of this part, must submit a revised design plan to the Administrator for approval as follows:
1. At least 90 days before expanding operations in an area not covered by the previously approved design plan.
 2. Prior to installing or expanding the gas collection system in a way that is not consistent with the design plan that was submitted to the Administrator according to paragraph (c) of 40 C.F.R. §60.767.
- e) **Closure report.** Each owner or operator of a controlled landfill must submit a closure report to the Administrator within 30 days of waste acceptance cessation. The Administrator may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the Administrator, no additional wastes may be placed into the landfill without filing a notification of modification as described under 40 C.F.R. §60.7(a)(4).
- f) **Equipment removal report.** Each owner or operator of a controlled landfill must submit an equipment removal report to the Administrator 30 days prior to removal or cessation of operation of the control equipment.
1. The equipment removal report must contain all of the following items:
 - i. A copy of the closure report submitted in accordance with paragraph (e) of 40 C.F.R. §60.767;
 - ii. A copy of the initial performance test report demonstrating that the 15-year minimum control period has expired, unless the report of the results of the performance test has been submitted to the EPA via the EPA's CDX, or information that demonstrates that the GCCS will be unable to operate for 15 years due to declining gas flows. In the equipment removal report, the process

- unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX; and
- iii. Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 34 megagrams or greater of NMOC per year, unless the NMOC emission rate reports have been submitted to the EPA via the EPA's CDX. If the NMOC emission rate reports have been previously submitted to the EPA's CDX, a statement that the NMOC emission rate reports have been submitted electronically and the dates that the reports were submitted to the EPA's CDX may be submitted in the equipment removal report in lieu of the NMOC emission rate reports.
2. The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in 40 C.F.R. §60.762(b)(2)(v) have been met.
- g) **Annual report.** The owner or operator of a landfill seeking to comply with 40 C.F.R. §60.762(b)(2) using an active collection system designed in accordance with 40 C.F.R. §60.762(b)(2)(ii) must submit to the Administrator, following the procedure specified in paragraph (i)(2) of 40 C.F.R. §60.767, annual reports of the recorded information in paragraphs (g)(1) through (7) of 40 C.F.R. §60.767. The initial annual report must be submitted within 180 days of installation and startup of the collection and control system and must include the initial performance test report required under 40 C.F.R. §60.8, as applicable, unless the report of the results of the performance test has been submitted to the EPA via the EPA's CDX. In the initial annual report, the process unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX. For enclosed combustion devices and flares, reportable exceedances are defined under 40 C.F.R. §60.768(c). If complying with the operational provisions of 40 C.F.R. §§63.1958, 63.1960, and 63.1961 of this chapter, as allowed at 40 C.F.R. §60.762(b)(2)(iv), the owner or operator must follow the semi-annual reporting requirements in 40 C.F.R. §63.1981(h) of this chapter in lieu of this paragraph.
1. Value and length of time for exceedance of applicable parameters monitored under 40 C.F.R. §60.766(a), (b), (c), (d), and (g).
 2. 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 under 40 C.F.R. §60.766.
 3. Description and duration of all periods when the control device or treatment system was not operating and length of time the control device or treatment system was not operating.
 4. All periods when the collection system was not operating.
 5. The location of each exceedance of the 500 parts per million methane concentration as provided in 40 C.F.R. §60.763(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month. For location, you must determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.
 6. The date of installation and the location of each well or collection system expansion added pursuant to 40 C.F.R. §60.765(a)(3), (a)(5), (b), and (c)(4).

7. For any corrective action analysis for which corrective actions are required in 40 C.F.R. §60.765(a)(3) or (5) 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 or elevated temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.
- h) **Initial performance test report.** Each owner or operator seeking to comply with 40 C.F.R. §60.762(b)(2)(iii) must include the following information with the initial performance test report required under 40 C.F.R. §60.8:
 1. A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;
 2. The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;
 3. The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;
 4. The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area; and
 5. The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill; and
 6. The provisions for the control of off-site migration.
- i) **Electronic reporting.** The owner or operator must submit reports electronically according to paragraphs (i)(1) and (2) of 40 C.F.R. §60.767.
 1. Within 60 days after the date of completing each performance test (as defined in § 60.8), the owner or operator must submit the results of each performance test according to the following procedures:
 - i. For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT Web site (https://www3.epa.gov/ttn/chief/ert/ert__info.html) at the time of the test, you must submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI). CEDRI can be accessed through the EPA's Central Data Exchange (CDX) (<https://cdx.epa.gov/>). Performance test data must be submitted 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 Web site, once the XML schema is available. If you claim that some of the performance test information being submitted is confidential business information (CBI), you must 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 Web site, including information

claimed to be CBI, on a compact disc, flash drive or other commonly used electronic storage media to the EPA. The electronic media must be clearly marked as CBI and mailed to U.S. EPA/OAQPS/CORE CBI Office, Attention: Group Leader, Measurement Policy Group, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same ERT or alternate file with the CBI omitted must be submitted to the EPA via the EPA's CDX as described earlier in this paragraph.

- ii. For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT Web site at the time of the test, you must submit the results of the performance test to the Administrator at the appropriate address listed in 40 C.F.R. §60.4.
2. Each owner or operator required to submit reports following the procedure specified in this paragraph must submit reports to the EPA via the CEDRI. (CEDRI can be accessed through the EPA's CDX.) The owner or operator must use the appropriate electronic report in CEDRI for this subpart or an alternate electronic file format consistent with the XML schema listed on the CEDRI Web site (<https://www3.epa.gov/ttn/chief/cedri/index.html>). If the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the owner or operator must submit the report to the Administrator at the appropriate address listed in 40 C.F.R. §60.4. Once the form has been available in CEDRI for 90 calendar days, the owner or operator must begin submitting all subsequent reports via CEDRI. The reports must be submitted by the deadlines specified in this subpart, regardless of the method in which the reports are submitted.
- j) **Corrective action and the corresponding timeline.** The owner or operator must submit according to paragraphs (j)(1) and (2) of 40 C.F.R. §60.767. If complying with the operational provisions of 40 C.F.R. §§63.1958, 63.1960, and 63.1961 of this chapter, as allowed at 40 C.F.R. §60.762(b)(2)(iv), the owner or operator must follow the corrective action and the corresponding timeline requirements in 40 C.F.R. §63.1981(j) of this chapter in lieu of this paragraph.
 1. For corrective action that is required according to 40 C.F.R. §60.765(a)(3)(iii) or (a)(5)(iii) and is expected to take longer than 120 days after the initial exceedance to complete, you must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator 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). The Administrator must approve the plan for corrective action and the corresponding timeline.
 2. For corrective action that is required according to 40 C.F.R. §60.765(a)(3)(iii) or (a)(5)(iii) and is not completed within 60 days after the initial exceedance, you must submit a notification to the Administrator as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature exceedance.
- k) **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 10 years must submit to the Administrator, annually, following the procedure specified in paragraph (i)(2) of 40 C.F.R. §60.767, the following information:
 1. Volume of leachate recirculated (gallons per year) and the reported basis of those estimates (records or engineering estimates).

2. Total volume of all other liquids added (gallons per year) and the reported basis of those estimates (records or engineering estimates).
 3. Surface area (acres) over which the leachate is recirculated (or otherwise applied).
 4. Surface area (acres) over which any other liquids are applied.
 5. The total waste disposed (megagrams) in the areas with recirculated leachate and/or added liquids based on on-site records to the extent data are available, or engineering estimates and the reported basis of those estimates.
 6. The annual waste acceptance rates (megagrams per year) in the areas with recirculated leachate and/or added liquids, based on on-site records to the extent data are available, or engineering estimates.
 7. The initial report must contain items in paragraph (k)(1) through (6) of 40 C.F.R. §60.767 per year for the initial annual reporting period as well as for each of the previous 10 years, to the extent historical data are available in on-site records, and the report must be submitted no later than:
 - i. September 27, 2017, for landfills that commenced construction, modification, or reconstruction after July 17, 2014 but before August 29, 2016 containing data for the first 12 months after August 29, 2016; or
 - ii. Thirteen (13) months after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction after August 29, 2016 containing data for the first 12 months after August 29, 2016.
 8. Subsequent annual reports must contain items in paragraph (k)(1) through (6) of 40 C.F.R. §60.767 for the 365-day period following the 365-day period included in the previous annual report, and the report must be submitted no later than 365 days after the date the previous report was submitted.
 9. Landfills may cease annual reporting of items in paragraphs (k)(1) through (7) of 40 C.F.R. §60.767 once they have submitted the closure report in paragraph (e) of 40 C.F.R. §60.767
- l) **Tier 4 notification.**
1. The owner or operator of an affected landfill with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters must provide a notification of the date(s) upon which it intends to demonstrate site-specific surface methane emissions are below 500 parts per million methane, based on the Tier 4 provisions of 40 C.F.R. §60.764(a)(6). The landfill must also include a description of the wind barrier to be used during the SEM in the notification. Notification must be postmarked not less than 30 days prior to such date.
 2. If there is a delay to the scheduled Tier 4 SEM date due to weather conditions, including not meeting the wind requirements in 40 C.F.R. §60.764(a)(6)(iii)(A), the owner or operator of a landfill shall notify the Administrator by email or telephone no later than 48 hours before any delay or cancellation in the original test date, and arrange an updated date with the Administrator by mutual agreement.

- m) Each owner or operator that chooses to comply with the provisions in 40 C.F.R. §§63.1958, 63.1960, and 63.1961, as allowed at 40 C.F.R. §60.762(b)(2)(iv), must submit the 24-hour high temperature report according to 40 C.F.R. §63.1981(k) of this chapter.

[40 C.F.R. §60.767; 45CSR23§5.1]