Permit #: **28.1101-01**

Effective Date: **June 13, 2013**

Expiration Date: **March 26, 2014**

SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

TITLE V AIR QUALITY OPERATING PERMIT

Steven M Pirner, Secretary
Department of Environment and Natural Resources

Under the South Dakota Air Pollution Control Regulations

Pursuant to Chapter 34A-1-21 of the South Dakota Codified Laws and the Air Pollution Control Regulations of the State of South Dakota and in reliance on statements made by the owner designated below, a permit to operate is hereby issued by the Secretary of the Department of Environment and Natural Resources. This permit authorizes such owner to operate the unit(s) listed in Table #1 under the listed conditions.

A. Owner

1. Company Name and Mailing Address

Sioux Falls Regional Sanitary Landfill
224 West 9th Street
Sioux Falls, SD 57104

2. Actual Source Location if Different from Above

26750 464th Avenue; Sioux Falls, South Dakota

3. Permit Contact

Robert J. Kappel, Environmental Compliance Manager
605-367-8277

4. Facility Contact

Dave McElroy, Landfill Superintendent
605-367-8163

5. Responsible Official

Mark D. Cotter, Director of Public Works
605-367-8600

B. Permit Revisions or Modifications

March 26, 2013: Replace flare with 2011 LPG Flare

C. Type of Operation

Existing municipal solid waste landfill

TABLE OF CONTENTS

Page

1.0 STANDARD CONDITIONS 1
- 1.1 Operation of source 1
- 1.2 Duty to comply 1
- 1.3 Property rights or exclusive privileges 1
- 1.4 Penalty for violating a permit condition 2
- 1.5 Inspection and entry 2
- 1.6 Severability 2
- 1.7 Permit termination, modification, or revocation 2
- 1.8 Credible evidence 2

2.0 PERMIT FEES 2
- 2.1 Annual air fee required 2
- 2.2 Annual operational report 3
- 2.3 Annual air fee 3

3.0 PERMIT AMENDMENT AND MODIFICATION CONDITIONS 3
- 3.1 Permit flexibility 3
- 3.2 Administrative permit amendment 3
- 3.3 Minor permit amendment 4
- 3.4 Permit modification 4
- 3.5 Permit revision 5
- 3.6 Testing new fuels or raw materials 5

4.0 PERMIT RENEWAL REQUIREMENTS 5
- 4.1 Permit effective 5
- 4.2 Permit renewal 5
- 4.3 Permit expiration 6

5.0 RECORDKEEPING AND REPORTING REQUIREMENTS 6
- 5.1 Record keeping and reporting 6
- 5.2 Signatory Requirements. 6
- 5.3 Certification statement 6
- 5.4 Annual compliance certification 7
- 5.5 Reporting permit violations. 7

6.0 REPORTING NMOC EMISSION RATE 7
- 6.1 Nonmethane organic compound emission rate report 7
- 6.2 Estimating annual nonmethane organic compound emission rate 8
- 6.3 Tier 1 – NMOC emission rate based on default values 8
- 6.4 Tier 2 – Site specific nonmethane organic compound concentration 9
- 6.5 Site specific testing for nonmethane organic compound concentration 9
- 6.6 Tier 3 – Site specific methane generation rate 10
- 6.7 Site specific testing for methane generation rate 10
- 6.8 Alternative methods 10

7.0 INSTALLATION OF COLLECTION AND CONTROL SYSTEM 10

TABLE OF CONTENTS

Page

7.1 Submittal of collection and control system design plan 10
7.2 Specifications for the collection system 11
7.3 Construction requirements for the collection system 12
7.4 Construction requirements for conveying landfill gas 12
7.5 Installation of collection system 13
7.6 Installation of wells 13
7.7 Installation of control system 13
7.8 Schedule for installing collection and control system 13
7.9 Initial startup of gas collection system 14
7.10 Initial compliance determination for gas collection system 14
7.11 Operational requirements for collection and control system 15
7.12 Monitoring active gas collection systems 16
7.13 Monitoring other approved devices 16
7.14 Monitoring other approved collection systems 16
7.15 General records for collection and control system 17
7.16 Initial performance test report 17
7.17 Semiannual report for an active collection system 18
7.18 Periods of startup, shutdown, or malfunctions 18
7.19 Develop and implement a startup, shutdown, and malfunction plan 18
7.20 Records of startup, shutdown, and malfunction 19
7.21 Maintaining a startup, shutdown, and malfunction plan 19
7.22 Deviations from control device operating parameters 20

8.0 PERFORMANCE TESTS 20
8.1 Performance test may be required 20
8.2 Test methods and procedures 20
8.3 Representative performance test 20
8.4 Submittal of test plan 21
8.5 Notification of test 21
8.6 Performance test report. 21

9.0 OPEN FLARE REQUIREMENTS 21
9.1 Open flare specifications 21
9.2 Monitoring an open flare 23
9.3 Initial performance test for open flare 23
9.4 Initial startup of open flare 24
9.5 Records maintained for open flares 24

10.0 ENCLOSED COMBUSTOR REQUIREMENTS 24
10.1 Enclosed combustor specifications 24
10.2 Monitoring an enclosed combustor 25
10.3 Initial performance test for enclosed combustors 25
10.4 Initial startup of enclosed combustor 26
10.5 Records maintained for enclosed combustors 26

11.0 SURFACE EMISSION MONITORING 27

TABLE OF CONTENTS

Page

11.1 Surface emission monitoring limit 27
11.2 Surface emission monitoring specifications 27
11.3 Surface emission monitoring 27

12.0 SOLID WASTE LANDFILL CLOSURE REQUIREMENTS 29
12.1 Closure notification 29
12.2 Capping collection and control system 29
12.3 Calculating nonmethane organic compound gas production rate 29
12.4 Control equipment removal notification 30
12.5 Permit termination 30

13.0 Control of Regulated Air Pollutants 30
13.1 Visibility limit 30
13.2 Visibility exceedances 30
13.3 Air emission exceedances – emergency conditions 30
13.4 Circumvention not allowed 31
13.5 Minimizing emissions 31

14.0 Flare Operational Requirements 31
14.1 Flare operational limits 31
14.2 Monitoring visible emissions 32
14.3 Monitoring for a flame 32
14.4 Monitoring net heating value 32
14.5 Determining actual exit velocity 32
14.6 Monitoring maximum permit velocity for air-assisted flares 33
14.7 Determining maximum permit velocity for non-assisted flares 33
14.8 Determining maximum permit velocity for non-assisted flares 33

1.0 STANDARD CONDITIONS

1.1 Operation of source. In accordance with Administrative Rules of South Dakota (ARSD) 74:36:05:16.01(8), the owner or operator shall operate the units, controls, and processes as described in Table 1-1 in accordance with the statements, representations, and supporting data contained in the complete permit application submitted and dated August 1, 2008, May 24, 2012 and August 14, 2012, unless modified by the conditions of this permit. Except as otherwise provided herein, the control equipment shall be operated in a manner that achieves compliance with the conditions of this permit at all times. The application consists of the application forms, supporting data, and supplementary correspondence. If the owner or operator becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, such information shall be promptly submitted.

Table 1-1 – Description of Permitted Units, Operations, and Processes

Unit	Description	Maximum Operating Rate	Control Device
#1	Municipal Solid Waste Landfill with a total capacity of 22.4 megagrams (24.7 million tons)	Not Applicable	Unit #2
#2	2011 LFG Specialties Landfill Gas Utility Flare	120 HP	Not Applicable

1.2 Duty to comply. In accordance with ARSD 74:36:05:16.01(12), the owner or operator shall comply with the conditions of this permit. An owner or operator who knowingly makes a false statement in any record or report or who falsifies, tampers with, or renders inaccurate, any monitoring device or method is in violation of this permit. A violation of any condition in this permit is grounds for enforcement, reopening this permit, permit termination, or denial of a permit renewal application. The owner or operator, in an enforcement action, cannot use the defense that it would have been necessary to cease or reduce the permitted activity to maintain compliance. The owner or operator shall provide any information requested by the Secretary to determine compliance or whether cause exists for reopening or terminating this permit.

1.3 Property rights or exclusive privileges. In accordance with ARSD 74:36:05:16.01(12), the State's issuance of this permit, adoption of design criteria, and approval of plans and specifications does not convey any property rights of any sort, any exclusive privileges, any authorization to damage, injure or use any private property, any authority to invade personal rights, any authority to violate federal, state or local laws or regulations, or any taking, condemnation or use of eminent domain against any property owned by third parties. The State does not warrant that the owner's or operator's compliance with this permit, design criteria, approved plans and specifications, and operation under this permit, will not cause damage, injury or use of private property, an invasion of personal rights, or violation of federal, state or local laws or regulations. The owner or operator is solely and severally liable for all damage, injury or use of private property, invasion of personal rights, infringement of federal, state or local laws and regulations, or taking or condemnation of property owned by third parties, which may result from actions taken under the permit.

1.4 Penalty for violating a permit condition. In accordance with South Dakota Codified Laws (SDCL) 34A-1-39 and 34A-1-47, a violation of a permit condition may subject the owner or operator to civil or criminal prosecution, a state penalty of not more than $10,000 per day per violation, injunctive action, administrative permit action, and other remedies as provided by law.

1.5 Inspection and entry. In accordance with SDCL 34A-1-41, the owner or operator shall allow the Secretary to:

1. Enter the premises where a regulated activity is located or where pertinent records are stored;
2. Have access to and copy any records that are required under this permit;
3. Inspect operations regulated under this permit; and/or
4. Sample or monitor any substances or parameters for the purpose of assuring compliance.

1.6 Severability. In accordance with ARSD 74:36:05:16.01(11), any portion of this permit that is void or challenged shall not affect the validity of the remaining permit requirements.

1.7 Permit termination, modification, or revocation. In accordance with ARSD 74:36:05:46, the Secretary may recommend that the Board of Minerals and Environment terminate, modify, or revoke this permit for violations of SDCL 34A-1 or the federal Clean Air Act or for nonpayment of any outstanding fee or enforcement penalty.

1.8 Credible evidence. In accordance with ARSD 74:36:13:07, credible evidence may be used for the purpose of establishing whether the owner or operator has violated or is violation of this permit. Credible evidence is as follows:

1. Information from the use of the following methods is presumptively credible evidence of whether a violation has occurred at the source:
   a. A monitoring method approved for the source pursuant to 40 CFR § 70.6(a)(3) and incorporated in this permit; or
   b. Compliance methods specified in an applicable plan;
2. The following testing, monitoring, or information gathering methods are presumptively credible testing, monitoring, or information-gathering methods:
   a. Any monitoring or testing methods approved in this permit, including those in 40 CFR Parts 51, 60, 61, and 75; or
   b. Other testing, monitoring, or information-gathering methods that produce information comparable to that produced by any method in section (1) or (2)(a).

2.0 PERMIT FEES

2.1 Annual air fee required. In accordance with ARSD 74:36:05:06.01, the owner or operator shall submit an annual administrative fee and an annual fee. The fee is based on actual emissions in accordance with ARSD 74:37.

2.2 Annual operational report. In accordance with ARSD 74:37:01:06, the Secretary will supply the owner or operator with an annual operational report in January of each year. The owner or operator shall complete and submit the operational report to the Secretary by March 1 of each year. The responsible official shall sign the operational report in the presence of a notary public.

2.3 Annual air fee. In accordance with ARSD 74:37:01:08, the Secretary will notify the owner or operator of the required annual air emission fee and administrative fee by June 1 of each year. The fees shall accrue on July 1 and are payable to the Department of Revenue by July 31 of each year.

3.0 PERMIT AMENDMENT AND MODIFICATION CONDITIONS

3.1 Permit flexibility. In accordance with ARSD 74:36:05:30, the owner or operator shall have the flexibility to make changes to the source during the term of this permit. The owner or operator shall provide the Secretary written notice at least seven days in advance of the proposed change (NOTE: The Secretary will forward a copy of the written notice to EPA). The written notice shall include a brief description of the change, the date on which the change is to occur, any change in emissions, the proposed changes to the permit, and whether the requested revisions are for an administrative permit amendment, minor permit amendment, or permit modification.

The Secretary will notify the owner or operator whether the change is an administrative permit amendment, a minor permit amendment, or a permit modification. A proposed change that is considered an administrative permit amendment or a minor permit amendment can be completed immediately after the Secretary receives the written notification. The owner or operator must comply with both the applicable requirements governing the change and the proposed permit terms and conditions until the Secretary takes final action on the proposed change.

A proposed change that is considered a modification can not be constructed until the Secretary takes final action on the proposed change. Permit modifications are subject to the same procedural requirements, including public comment, as the original permit issuance except that the required review shall cover only the proposed changes.

3.2 Administrative permit amendment. In accordance with ARSD 74:36:05:33, the Secretary has 60 days from receipt of a written notice to verify that the proposed change is an administrative permit amendment. As provided in ASRD 74:36:01:03, the Secretary considers a proposed change an administrative permit amendment if the proposed change accomplishes one of the following:

1. Corrects typographical errors;
2. Changes the name, address, or phone number of any person identified in this permit or provides a similar minor administrative change at the source;
3. Requires more frequent monitoring or reporting by the source;

4. The ownership or operational control of a source change and the Secretary determines that no other change in this permit is necessary. However, the new owner must submit a certification of applicant form and a written statement specifying the date for transfer of operating permit responsibility, coverage, and liability; or
5. Any other changes that the Secretary and the administrator of EPA determines to be similar to those requirements in this condition.

3.3 Minor permit amendment. In accordance with ARSD 74:36:05:38, the Secretary has 90 days from receipt of a written notice or 15 days after the end of EPA's 45-day review period, whichever is later, to take final action on a minor permit amendment. Final action consists of issuing or denying a minor permit amendment or determining that the proposed change is a permit modification. As provided in ASRD 74:36:04:20:02, the Secretary considers a proposed change to be a minor permit amendment if the proposed change:

1. Does not violate any applicable requirements;
2. Does not involve significant changes to existing monitoring, reporting, or record keeping requirements;
3. Does not require or change a case-by-case determination of an emission limit or other standard, a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis; or
4. Does not seek to establish or change a permit term or condition for which the source has assumed to avoid an applicable requirement, a federally enforceable emission cap, or an alternative emission limit. An alternative emission limit is approved pursuant to regulations promulgated under section 112(i)(5) of the federal Clean Air Act.

3.4 Permit modification. In accordance with ARSD 74:36:05:39, an owner or operator may apply for a permit modification. A permit modification is defined in ARSD 74:36:01:10 as a physical change in or change in the operation of a source that results in at least one of the following:

1. An increase in the amount of an air pollutant emitted by the source or results in the emission of an air pollutant not previously emitted;
2. A significant change to existing monitoring, reporting, or record keeping requirements in the permit;
3. The change requires or changes a case-by-case determination of an emission limit or other standard, a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis; or
4. The change seeks to establish or change a permit term or condition for which there is a corresponding underlying applicable requirement that the source has assumed to avoid an applicable requirement, a federally enforceable emissions cap assumed to avoid classification as a modification under a provision of the Title I of the Clean Air Act, or an alternative emissions limit approved pursuant to regulations promulgated under section 112(i)(5) of the Clean Air Act.

Permit modifications are subject to the same procedural requirements, including public comment, as the original permit issuance except that the required review shall cover only the proposed changes.

3.5 Permit revision. In accordance with ARSD 74:36:05:40, the Secretary may reopen and revise this permit to meet requirements of SDCL 34A-1 or the federal Clean Air Act.

3.6 Testing new fuels or raw materials. In accordance with ARSD 74:36:11:04, an owner or operator may request permission to test a new fuel or raw material to determine if it is compatible with existing equipment before requesting a permit amendment or modification. A complete test proposal shall consist of the following:

1. A written proposal that describes the new fuel or raw material, operating parameters, and parameters that will be monitored and any testing associated with air pollutant emissions during the test;
2. An estimate of the type and amount of regulated air pollutant emissions that will result from the proposed change; and
3. The proposed schedule for conducting the test. In most cases the owner or operator will be allowed to test for a maximum of one week. A request for a test period longer than one week will need additional justification. A test period shall not exceed 180 days.

The Secretary shall approve, conditionally approve, or deny in writing the test proposal within 45 days after receiving a complete proposal. Approval conditions may include changing the test schedule or pollutant sampling and analysis methods. Pollutant sampling and analysis methods may include, but are not limited to performance testing, visible emission evaluation, fuel analysis, dispersion modeling, and monitoring of raw material or fuel rates.

If the Secretary determines that the proposed change will result in an increase in the emission of a regulated air pollutant or result in the emission of an additional regulated air pollutant, the Secretary shall give public notice of the proposed test for 30 days. The Secretary shall consider all comments received during the 30-day public comment period before making a final decision on the test.

The Secretary will not approve a test if the test would cause or contribute to a violation of a national ambient air quality standard.

4.0 PERMIT RENEWAL REQUIREMENTS

4.1 Permit effective. In accordance with ARSD 74:36:05:07, this permit shall expire five years from date of issuance unless reopened or terminated for cause.

4.2 Permit renewal. In accordance with ARSD 74:36:05:08, the owner or operator shall submit an application for a permit renewal at least 180 days before the date of permit expiration if the owner or operator wishes to continue an activity regulated by this permit. The current

permit shall not expire and shall remain in effect until the Secretary takes final action on the timely permit renewal application.

4.3 Permit expiration. In accordance with ARSD 74:36:05:28, permit expiration terminates the owner's or operator's right to operate any unit covered by this permit.

5.0 RECORDKEEPING AND REPORTING REQUIREMENTS

5.1 Record keeping and reporting. In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall maintain all monitoring data, records, reports, and pertinent information specified by this permit for five years from the date of sample, measurement, report, or application unless otherwise specified in this permit. The records shall be maintained on site for the first two years and may be maintained off site for the last three years. All records must be made available to the Secretary for inspection. All notifications and reports shall be submitted to the following address:

South Dakota Department of Environment and Natural Resources
PMB 2020, Air Quality Program
523 E. Capitol, Joe Foss Building
Pierre, SD 57501-3182

5.2 Signatory Requirements. In accordance with ARSD 74:36:05:12 and ARSD 74:36:05:16.01, all applications submitted to the Secretary shall be signed and certified by a responsible official. A responsible official for a corporation is a responsible corporate officer and for a partnership or sole proprietorship is a general partner or the proprietor, respectively. All reports or other information submitted to the Secretary shall be signed and certified by a responsible official or a duly authorized representative. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Secretary; and
2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

The responsible official shall notify the Secretary if an authorization is no longer accurate. The new duly authorized representative must be designated prior to or together with any reports or information to be signed by a duly authorized representative.

5.3 Certification statement. In accordance with ARSD 74:36:05:16.01(14)(a), all documents required by this permit, including application forms, reports, and compliance certification, must be certified by a responsible official or a duly authorized representative. The certification shall include the following statement:

"I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this document and all attachments are true, accurate, and complete."

5.4 Annual compliance certification. In accordance with ARSD 74:36:05:16.01(14), the owner or operator shall submit an annual compliance certification letter to the Secretary by March 1 of each year this permit is in effect (NOTE: The Secretary will forward a copy of the certification letter to EPA). The certification shall contain the following information:

1. Methods used to determine compliance, including: monitoring, record keeping, performance testing and reporting requirements;
2. The source is in compliance and will continue to demonstrate compliance with all applicable requirements;
3. In the event the source is in noncompliance, a compliance plan that indicates how the source has or will be brought into compliance; and
4. Certification statement required in permit condition 5.3.

5.5 Reporting permit violations. In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall report all permit violations. A permit violation should be reported as soon as possible, but no later than the first business day following the day the violation was discovered. The permit violation may be reported by telephone to the South Dakota Department of Environment and Natural Resources at (605) 773-3151 or by FAX at (605) 773-5286.

A written report shall be submitted within five days of discovering the permit violation. Upon prior approval from the Secretary, the submittal deadline for the written report may be extended up to 30 days. The written report shall contain:

1. Description of the permit violation and its cause(s);
2. Duration of the permit violation, including exact dates and times; and
3. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the permit violation.

6.0 REPORTING NMOC EMISSION RATE

6.1 Nonmethane organic compound emission rate report. In accordance with ARSD 74:36:07:42.01, as referenced to 40 CFR § 60.757(b), the owner or operator shall submit an annual nonmethane organic compound emission rate report. The nonmethane organic compound emission rate report shall contain the following:

1. An annual estimate of the nonmethane organic compound emission rate; and
2. The report shall include all the data, calculations, sample reports and measurements used to estimate the annual emissions.

The owner or operator may elect to submit one report that contains an estimate of the nonmethane organic compound emission rate for a 5-year period in lieu of the annual report. The owner or operator is eligible for this option if the estimated nonmethane organic compound

emission rate as reported in the annual report is less than 50 megagrams per year for five consecutive years. The estimate shall include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the five years for which a nonmethane organic compound emission rate is estimated. All data and calculations upon which this estimate is based shall be submitted in the 5-year estimate report. The 5-year estimate report shall be revised if the actual waste acceptance rate exceeds the estimated waste acceptance rate. The revised 5-year estimate report shall cover a 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

The annual or 5-year estimate report shall be submitted by March 1 and may be submitted with the compliance certification report.

The owner or operator is exempt from this permit condition after the installation of a collection and control system and during such time as the collection and control system is in operation and in compliance with this permit.

6.2 Estimating annual nonmethane organic compound emission rate. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.752(b)(1), the owner or operator shall estimate the annual nonmethane organic compound emission rate using the following Tiers:

Tier 1. Calculate the nonmethane organic compound emission rate using the default values in permit condition 6.3;

Tier 2. Calculate the nonmethane organic compound emission rate using a site specific nonmethane organic compound concentration as determined by permit condition 6.4; or

Tier 3. Calculate the nonmethane organic compound emission rate using a site specific methane generation rate as determined by permit condition 6.6.

6.3 Tier 1 – NMOC emission rate based on default values. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.754(a)(1) and (2), the owner or operator may calculate the annual nonmethane organic compound emission rate based on Equation 6-1 and/or 6-2.

Equation 6-1

$$M_{NMOC} = \sum_{i=1}^{n} 2kLoMi(e^{-kt_i})(C_{NMOC})(3.6x10^{-9})$$

Equation 6-2

$$M_{NMOC} = L_o R\left(e^{-kc} - e^{-kt}\right)\left(C_{NMOC}\right)\left(3.6x10^{-9}\right)$$

The following default values shall be used in Equation 6-1 and 6-2:

- M_{NMOC} = mass emission rate of nonmethane organic compound, megagrams per year;
- k = 0.05 per year, methane generation rate constant. For landfills located in geographical areas with a thirty year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorological site, the k value to be used is 0.02 per year;
- Lo = 170 cubic meters per megagram solid waste, methane generation potential;
- Mi = mass of solid waste in the ith section, megagrams;
- t_i = age of the ith section, years;
- C_{NMOC} = 4,000 parts per million by volume as hexane, concentration of nonmethane organic compounds;

- R = average annual acceptance rate, megagrams per year;
- c = time since closure, years. For active landfill c = 0 and $e^{-kc} = 1$; and
- t = age of landfill, years.

Equation 6-1 shall be used if the actual year-to-year solid waste acceptance rate is known. Equation 6-2 shall be used if the actual year-to-year solid waste acceptance rate is unknown. Both equations may be used if the actual year-to-year solid waste acceptance rate is known for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown. The mass of nondegradable solid waste may be subtracted from the average annual acceptance rate when calculating a value for "R", if documentation of the nature and amount of such wastes in maintained.

6.4 Tier 2 – Site specific nonmethane organic compound concentration. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.754(a)(3)(i), (ii), and (iii), the owner or operator may use a site specific nonmethane organic compound concentration to calculate the annual nonmethane organic compound emission rate. The average nonmethane organic compound concentration from the collected samples shall be used in Equation 6-1 or 6-2 instead of the "C_{NMOC}" default value to calculate the nonmethane organic compound emission rate.

If the nonmethane organic compound emission rate is less than 50 megagrams per year, the owner or operator shall retest the site specific nonmethane organic compound concentration every five years using the testing methods required in this permit.

6.5 Site specific testing for nonmethane organic compound concentration. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.754(a)(3), the owner or operator may determine the nonmethane organic compound concentration "C_{NMOC}" by the one of the following testing methods:

1. The owner or operator shall install at least two sample probes per hectare of landfill surface that has retained waste for at least two years. If the landfill is larger than 25 hectares in area, only 50 samples are required. Sampling methods are as follows:
   A. The sample probes shall be located to avoid known areas of nondegradable solid waste;
   B. Collect and analyze one sample of landfill gas from each probe to determine the nonmethane organic compound concentration using 40 CFR Part 60, Appendix A, Method 25 or 25C. The concentrations measured from Method 25 or 25C shall be converted to concentration of nonmethane organic compounds as hexane by multiplying by the ratio of its carbon atoms divided by six;
   C. A composite sample from different probes collected in a single cylinder is allowed provided equal sample volumes are taken from each probe. Composite sample volumes should not be less than one liter unless evidence can be provided to substantiate the accuracy of smaller volumes. Composite sampling should be terminated before the cylinder approaches ambient pressure where measurement accuracy diminishes; and
   D. If using 40 CFR Part 60, Appendix A, Method 18, the owner or operator must identify all compounds in the sample and, as a minimum, test for those compounds published in the most recent Compilation of Air Pollutant Emission Factors, minus carbon monoxide, hydrogen sulfide, and mercury. As a minimum, the instrument must be calibrated for each of the compounds on the list. Convert the concentration of each Method 18

compound to concentration of nonmethane organic compounds as hexane by multiplying by the ratio of its carbon atoms divided by six; or

2. If the landfill has an active or passive gas removal system in place, 40 CFR Part 60, Appendix A, 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 before the gas moving or condensate removal equipment. For these systems, a minimum of three samples must be collected from the header pipe.

If more than the required number of samples is taken, all samples must be used in the analysis.

6.6 Tier 3 – Site specific methane generation rate. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.754(a)(4)(i) and (ii), the owner or operator may use a site specific methane generation rate to calculate the annual nonmethane organic compound emission rate. The site specific nonmethane organic compound concentration and the site specific methane generation rate "k" shall be used in Equation 6-1 or 6-2 instead of the default values to calculate the nonmethane organic compound emission rate. The site specific methane generation rate test is only performed once and the value obtained from this test shall be used in all subsequent annual nonmethane organic compound emission rate calculations.

6.7 Site specific testing for methane generation rate. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.754(a)(4), the owner or operator may determine the site specific methane generation rate "k" by using 40 CFR Part 60, Appendix A, Method 2E.

6.8 Alternative methods. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.754(a)(5), the owner or operator may use other methods to determine the site specific nonmethane organic compound concentration or methane generation rate if the method has been approved by the Secretary and EPA.

7.0 INSTALLATION OF COLLECTION AND CONTROL SYSTEM

7.1 Submittal of collection and control system design plan. In accordance with ARSD 74:36:07:35, as referenced to 40 CFR § 60.752(b)(2)(i), the owner or operator shall submit a collection and control system design plan prepared by a professional engineer within one year of the first annual report in which the nonmethane organic compound emission rate equals or exceeds 50 megagrams per year.

The owner or operator may elect to recalculate the nonmethane organic compound emission rate after Tier 2 sampling and analysis. If the resulting rate is less than 50 megagrams per year, the owner or operator shall submit a revised nonmethane organic compound emission rate report with the recalculated emission rate based on the site specific nonmethane organic compound concentration within 180 days of the first calculated exceedance of 50 megagrams per year. In addition, the owner or operator shall resume annual reporting of the nonmethane organic compound emission rate using the site specific nonmethane organic compound concentration.

The owner or operator may elect to recalculate the nonmethane organic compound emission rate after Tier 3 sampling and analysis. If the resulting rate is less than 50 megagrams per year, the owner or operator shall submit a revised nonmethane organic compound emission rate report with the recalculated emission rate based on the site specific methane generation rate within one year of the first calculated exceedance of 50 megagrams per year. In addition, the owner or operator shall resume annual reporting of the nonmethane organic compound emission rate using the site specific methane generation rate.

7.2 Specifications for the collection system. In accordance with ARSD 74:36:07:36, as referenced to 40 CFR § 60.759(a), the owner or operator that installs a collection and control system shall site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the Secretary:

1. The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depth of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control corrosion resistance, fill settlement, and resistance to the refuse decomposition heat;
2. The sufficient density of gas collection devices determined in section 1 of this permit condition shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior;
3. The placement of gas collection devices determined in section 1 of this permit condition shall control all gas producing areas, except as provided below:
   A. Any segregated area of asbestos or nondegradable material may be excluded from collection if documented. The documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area;
   B. 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 one percent of the total amount of nonmethane organic compound emissions from the landfill. The amount, location, and age of the material shall be documented. A separate nonmethane organic compound emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the nonmethane organic emissions estimate for the entire landfill. Emissions from each shall be computed using Equation 7-1; and

Equation 7-1 $$Q_i = 2kL_oM_i\left(e^{-kt_i}\right)\left(C_{NMOC}\right)\left(3.6x10^{-9}\right)$$

Where:

- Q_i = Nonmethane organic compound emission rate from the ith section, megagrams per year;
- k = methane generation rate constant, year $^{-1}$;
- Lo = methane generation potential, cubic meters per megagram solid waste;
- Mi = mass of the degradable solid waste in the ith section , megagram;

- ti = age of the solid waste in the ith section, years; and
- C_{NMOC} = concentration of nonmethane organic compounds, parts per million by volume.

C. The values for k and C_{NMOC} determined in field testing shall be used if field testing has been performed in determining the nonmethane organic compound emission rate or the radius of influence. The radius of influence is the distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approached zero. If field testing has not been performed, the default values for k, L_o and C_{NMOC} provide in permit condition 6.3 shall be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in subsection 3(A) of this permit condition.

7.3 Construction requirements for the collection system. In accordance with ARSD 74:36:07:36, as referenced to 40 CFR § 60.759(b), the owner or operator that installs a collection system shall construct the gas collection devices using the following equipment or procedures:

1. The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration;
2. Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations; and
3. Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

7.4 Construction requirements for conveying landfill gas. In accordance with ARSD 74:36:07:36, as referenced to 40 CFR § 60.759(c), the owner or operator installing a collection and control system shall convey the landfill gas to a control system through the collection header pipe(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

1. For existing collection systems, the flow data shall be used to project the maximum flow rate; and
2. If no flow data exists, the maximum flow rate shall be in accordance with permit condition 7.10(1).

7.5 Installation of collection system. In accordance with ARSD 74:36:07:36, as referenced to 40 CFR § 60.752(b)(2)(ii), the owner or operator shall install and operate one of the following collection systems:

1. An active collection system:
   A. 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 or treatment system equipment;
   B. That collects gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of five years or more if active or two years or more if closed or at final grade;
   C. That collects gas at a sufficient extraction rate; and
   D. Designed to minimize off-site migration of subsurface gas.
2. A passive collection system:
   A. That complies with subsection 1(A), 1(B), and 1(D) of this permit condition; and
   B. That is installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners shall be installed as required under 40 CFR § 258.40.

7.6 Installation of wells. In accordance with ARSD 74:36:07:40, as referenced to 40 CFR § 60.755(b), the owner or operator of a controlled landfill shall install each well or design component as specified in the approved design plan. Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:

1. Five years or more if active; or
2. Two years or more if closed or at final grade.

7.7 Installation of control system. In accordance with ARSD 74:36:07:37, as referenced to 40 CFR § 60.752(b)(2)(iii), the owner or operator shall route all the collected gas to a control system that meets the specifications in permit condition 9.1, 10.1, or route the collected gas to a treatment system that processes the collected gas for subsequent sale or use. All emissions from any atmospheric vent from the gas treatment system shall be controlled by an open flare, enclosed combustor, boiler, or process heater that meets the specifications in permit condition 9.1 or 10.1.

7.8 Schedule for installing collection and control system. In accordance with ARSD 74:36:07:38, the owner or operator shall install the collection and control system within the timelines listed below:

1. Award contracts within 15 months of the first annual report showing the nonmethane organic compound emissions equal or exceed 50 megagrams per year;
2. Begin construction within 18 months of the first annual report showing the nonmethane organic compound emissions equal or exceed 50 megagrams per year;
3. Complete construction within 30 months of the first annual report showing the nonmethane organic compound emissions equal or exceed 50 megagrams per year; and

4. Demonstrate compliance with all applicable requirements within 180 days of completing construction.

7.9 Initial startup of gas collection system. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.5, the owner or operator shall notify the Secretary in writing of the initial startup of the gas collection system. The written notification will identify the facility name, permit number, this permit condition, and the initial startup date of the gas collection system. The written notification shall be postmarked within 15 days after the initial startup date.

7.10 Initial compliance determination for gas collection system. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.8, the owner or operator shall demonstrate compliance with the gas collection system specifications within 180 days of installing the gas collection system. In accordance with ARSD 74:36:07:40, as referenced to 40 CFR § 60.755(a), the owner or operator shall demonstrate compliance using the following methods:

1. Equation 7-2 or 7-3 shall be used to calculate the maximum expected gas generation flow rate from the landfill.

Equation 7-2 $Q_m = 2L_o R(e^{-kc} - e^{-kt})$ **Equation 7-3** $Q_m = \sum_{i=1}^{n} 2kL_o M_i (e^{-kt_i})$

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 $e^{-kc} = 1$);
- M_i = mass of solid waste in the ith section, megagrams; and
- t_i = age of the ith section, years.

The k and L_o kinetic factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42) or other site specific values demonstrated to be appropriate and approved by the Secretary. If k has been determined as specified in permit condition 6.7, the value of k determined from the test shall be used. A value no more than 15 years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure. Equation 7-2 shall be used for sites with unknown year-to-year solid waste acceptance rate. Equation 7-3 shall be used with known year-to-year solid waste acceptance rate.

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 7-2 and 7-3. 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 7-2 or 7-3 or other methods shall be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment;

2. For the purposes of determining sufficient density of gas collectors, the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices 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 if the gas collection system flow rate is sufficient, the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within five calendar days, except when there is a fire or increased well temperature, a geomembrane or synthetic cover is installed, or it is a decommissioned well. If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of the other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Secretary for approval;
4. Owners or operators are not required to expand the system as required in section 3 of this permit condition during the first 180 days after gas collection system startup;
5. For the purpose of identifying if excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen. If a well exceeds one of the operating parameters listed in permit condition 7.11(3), action shall be initiated to correct the exceedance within five calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to he Secretary for approval; and
6. An owner or operator seeking to minimize off-site migration of subsurface gas through the use of a collection system not conforming to the specifications provided in this permit shall provide sufficient information that demonstrates off-site migration is being controlled to the satisfaction of the Secretary.

7.11 Operational requirements for collection and control system. In accordance with ARSD 74:36:07:39, as referenced to 40 CFR § 60.753, the owner or operator of a gas collection and control system shall operate the collection and control system as follows:

1. Operate the collection system such that gas is collected from each area, cell or group of cells in the municipal solid waste landfill in which solid waste has been in place for five years or more if active or two years or more if closed or at final grade;
2. Operate the collection system with negative pressure at each wellhead except under the following conditions:
   A. During a fire or increased well temperature, the owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire;
   B. When the collection system includes a geomembrane or synthetic cover, the owner or operator shall develop acceptable pressure limits in the design plan; and
   C. A decommissioned well;
3. Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 degrees Celsius and with a nitrogen level less than 20 percent or an oxygen level less

than five percent. The owner or operator may establish a higher operating temperature, nitrogen value, or oxygen value at a particular well if it can be demonstrated that the higher operating value does not cause fire or significantly inhibit anaerobic decomposition by killing methanogens. The nitrogen level shall be determined using 40 CFR Part 60, Appendix A, Method 3C. The oxygen level shall be determined by an oxygen meter using 40 CFR Part 60, Appendix A, Method 3A or 3C, except the span shall be set so that the regulatory limit is between 20 and 50 percent of the span; a data recorder is not required; only two calibration gases are required, a zero and span, and ambient air may be used as the span; a calibration error check is not required; and the allowable sample bias, zero drift and calibration drift are plus or minus 10 percent. An alternative test method for the nitrogen or oxygen levels may be established after receiving written approval from the Secretary;

4. Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill;
5. Operate the system such that all collected gases are vented to a control system. In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within one hour; and
6. Operate the control or treatment system at all times when the collected gas is routed to the system.

If monitoring demonstrates that the operational requirements in section 2, 3, and 4 of this permit condition are not met, corrective action shall be taken as specified in permit condition 7.10(3), (4), and (5) or 12.3. If corrective actions are taken in a timely manner, the monitored exceedance is not considered a violation of this permit condition.

7.12 Monitoring active gas collection systems. In accordance with ARSD 74:36:07:41, as referenced to 40 CFR § 60.756(a), the owner or operator of an active gas collection system shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead. The owner or operator shall monitor the following:

1. Measure the gauge pressure in the gas collection header on a monthly basis;
2. Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis; and
3. Monitor temperature of the landfill gas on a monthly basis.

7.13 Monitoring other approved devices. In accordance with ARSD 74:36:07:41, as referenced to 40 CFR § 60.756(d), the owner or operator using a device other than an open flare or an enclosed combustor shall provide information which describes the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Secretary shall approve the plan, request additional information be submitted, or specify additional monitoring procedures.

7.14 Monitoring other approved collection systems. In accordance with ARSD 74:36:07:41, as referenced to 40 CFR § 60.756(e), the owner or operator that installs a collection system that does not meet the specifications in this permit or monitors alternative parameters to those required in this permit shall describe the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring

procedures. The Secretary shall approve the plan, request additional information be submitted, or specify additional monitoring procedures.

7.15 General records for collection and control system. In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.758(a) and (e), the owner or operator shall maintain the following records for at least five years:

1. The design capacity report which triggered the installation and operation of a collection and control system;
2. The current amount of solid waste in-place;
3. The year-by-year waste acceptance rate;
4. All collection and control system exceedances of the operational standards in permit condition 7.11, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.758(d), the owner or operator shall maintain the following for the life of the collection system:

1. A plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector, records of the installation date, and location of all newly installed collectors; and
2. Records of the nature, date of deposition, amount, and location of asbestos containing or nondegradable waste excluded from collections as well as any nonproductive areas excluded from collection.

In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.758(b), the owner or operator shall maintain the following data for the life of the control system as measured during the initial performance test or compliance determination:

1. The maximum expected gas generation flow rate as calculated in permit condition 7.10(1); and
2. The density of wells, horizontal collectors, surface collectors, or other gas extraction devices.

Records of subsequent tests or monitoring shall be maintained for five years.

7.16 Initial performance test report. In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.757(g), the owner or operator that uses a control device shall submit the following information with the initial performance test results required in permit conditions 9.3 and 10.3:

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 location 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;
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.

7.17 Semiannual report for an active collection system. In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.757(f), and ARSD 74:36:08:30, as referenced to 40 CFR § 63.1980, the owner or operator of an active collection system shall submit a semiannual report of the following information:

1. Value and length of time for exceedance of applicable parameters monitored in accordance with permit conditions 7.12, 7.13, 9.2, and 10.2;
2. Description and duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow;
3. Description and duration of all periods when the control device was not operating for a period of one hour and length of time the control device was not operating;
4. All periods when the collection system was not operating in excess of five days;
5. The location of each exceedance of the 500 parts per million methane concentration at the surface of the landfill and the concentration recorded at each location for which an exceedance was recorded in the previous month;
6. The date of installation and the location of each well or collection system expansion; and
7. Instances when positive pressure occurs at a wellhead in efforts to avoid a fire;
8. Confirm that actions taken during the relevant reporting period during periods of startup, shutdown, and malfunctions were consistent with the startup, shutdown, and malfunction plan;
9. Revisions to the startup, shutdown, and malfunction plan during the relevant reporting period;

The initial semiannual report shall be submitted within 180 days of installation and startup of the collection and control system, and shall include the initial performance test report. For enclosed combustion devices and flares, reportable exceedances are defined in permit conditions 9.5 and 10.5.

7.18 Periods of startup, shutdown, or malfunctions. In accordance with ARSD 74:36:07:40, as referenced to 40 CFR § 60.755(e), the provisions of this permit apply at all times, except during periods of startup, shutdown, or malfunctions, provided that the duration of startup, shutdown, or malfunction shall not exceed five days for collection systems and shall not exceed one hour for treatment or control devices.

7.19 Develop and implement a startup, shutdown, and malfunction plan. In accordance with ARSD 74:36:08:03, as referenced to 40 CFR § 63.6(e)(3)(i), (ii), and (vi), the owner or operator shall develop a written startup, shutdown and malfunction plan and implement the plan by the initial startup date of the collection system. The startup, shutdown, and malfunction plan shall:

1. Describe the procedures for operating and maintaining the collection and control system in a manner consistent with safety and good air pollution control practices for minimizing emissions to the levels required by the relevant standards during periods of startup, shutdown, and malfunction;
2. Describe a program to correct malfunctions as soon as practicable after its occurrence in order to minimize excess emissions of hazardous air pollutants;
3. Describe the procedures for operating and maintaining an air pollution control device and associated monitoring device in a manner consistent with safety and good air pollution control practices for minimizing emissions to the levels required by the relevant standards; and
4. Reduce the reporting burden associated with periods of startup, shutdown, and malfunction including the corrective action taken to restore a malfunction to its normal or usual manner of operation.

During periods of startup, shutdown, or malfunction, the owner or operator shall operate and maintain the collection and control system and associated monitoring equipment in accordance with the procedures specified in the startup, shutdown and malfunction plan.

7.20 Records of startup, shutdown, and malfunction. In accordance with ARSD 74:36:08:03, as referenced to 40 CFR § 63.6(e)(3)(iii) and (iv), the owner or operator shall maintain records that demonstrate the owner or operator followed the startup, shutdown, and malfunction plan during startup, shutdown, or a malfunction. The records may take the form of a "checklist," or other effective form of record keeping that confirms conformance with the startup, shutdown, and malfunction plan for that event. In addition, the owner or operator must keep records of the occurrence and duration of each startup, shutdown, or malfunction.

7.21 Maintaining a startup, shutdown, and malfunction plan. In accordance with ARSD 74:36:08:03, as referenced to 40 CFR § 63.6(e)(3)(v), (vii), and (viii), the owner or operator shall maintain a current startup, shutdown, and malfunction plan at the municipal solid waste landfill. The owner or operator shall revise the startup, shutdown, and malfunction plan for the following reasons:

1. The plan does not address a startup, shutdown, or malfunction event that has occurred;
2. The plan fails to provide for the operation of the collection and control system and associated monitoring equipment during a startup, shutdown, or malfunction event in a manner consistent with safety and good air pollution control practices for minimizing emissions to the levels required by the relevant standards;
3. The plan does not provide adequate procedures for correcting malfunction process and/or air pollution control and monitoring equipment as quickly as practicable. In this case, the startup, shutdown, and malfunction plan shall revised within 45 days after the event;
4. The plan includes an event that does not meet the definition of startup, shutdown, or malfunction; or
5. Periodical revisions are necessary to reflect changes in equipment or procedures at the municipal solid waste landfill.

If the startup, shutdown, and malfunction plan is revised, the owner or operator must maintain each previous version of the startup, shutdown, and malfunction plan at the municipal solid waste landfill. If at any time after adoption of the startup, shutdown, or malfunction plan the

municipal solid waste landfill ceases operation or is otherwise no longer subject to operating a collection and control system, the owner or operator must retain a copy of the most recent plan for five years from the date the source ceases operation or is no longer required to operate a collection and control system.

7.22 Deviations from control device operating parameters. In accordance with ARSD 74:36:08:30, as referenced to 40 CFR §§ 63.1960, 63.1965, and 63.1975, the continuous parameter monitoring data required in permit conditions 7.13, 9.2, and 10.2 shall be used to demonstrate compliance with the operating conditions for the control system. The 3-hour block average used for compliance shall not include data collected during a monitoring system breakdown, repair, calibration check, and zero and high-level adjustment; startups, shutdowns, or malfunctions. A deviation occurs when:

1. The control device operating parameter required to be recorded in permit condition 10.5(2) is exceeded;
2. One hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour; and
3. A startup, shutdown, and malfunction plan is not developed, implemented, or maintained on site.

8.0 PERFORMANCE TESTS

8.1 Performance test may be required. In accordance with ARSD 74:36:11:02, the Secretary may request a performance test during the term of this permit. A performance test shall be conducted while operating the unit at or greater than 90 percent of its maximum design capacity, unless otherwise specified by the Secretary. A performance test conducted while operating less than 90 percent of its maximum design capacity will result in the operation being limited to the percent achieved during the performance test. The Secretary has the discretion to extend the deadline for completion of performance test required by the Secretary if circumstances reasonably warrant but will not extend the deadline past a federally required performance test deadline.

8.2 Test methods and procedures. In accordance with ARSD 74:36:11:01, the owner or operator shall conduct the performance test in accordance with 40 CFR Part 60, Appendix A, 40 CFR Part 63, Appendix A, and 40 CFR Part 51, Appendix M. The Secretary may approve an alternative method if a performance test specified in 40 CFR Part 60, Appendix A, 40 CFR Part 63, Appendix A, and 40 CFR Part 51, Appendix M is not federally applicable or federally required.

8.3 Representative performance test. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.8(c), performance tests shall be conducted under such conditions as the Secretary shall specify to the owner or operator based on the representative performance of the unit being tested. The owner or operator shall make available to the Secretary such records as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of

a performance test nor shall emissions in excess of the level of the applicable emission limit during periods of startup, shutdown, and malfunction be considered a violation of the applicable emission limit unless otherwise specified in this permit.

8.4 Submittal of test plan. In accordance with ARSD 74:36:11:01, the owner or operator shall submit the proposed testing procedures to the Secretary at least 30 days prior to any performance test. The Secretary will notify the owner or operator if the proposed test procedures are approved or denied. If the proposed test procedures are denied, the Secretary will provide written notification that outlines what needs to be completed for approval.

8.5 Notification of test. In accordance with ARSD 74:36:11:03, the owner or operator shall notify the Secretary at least 10 days prior to the start of a performance test to arrange for an agreeable test date when the Secretary may observe the test. The Secretary may extend the deadline for the performance test in order to accommodate schedules in arranging an agreeable test date.

8.6 Performance test report. In accordance with ARSD 74:36:05:16.01(9), the owner or operator shall submit a performance test report to the Secretary within 60 days after completing the performance test or by a date designated by the Secretary. The performance test report shall contain the following information:

1. A brief description of the process and the air pollution control system being tested;
2. Sampling location description(s);
3. A description of sampling and analytical procedures and any modifications to standard procedures;
4. Test results;
5. Quality assurance procedures and results;
6. Records of operating conditions during the test, preparation of standards, and calibration procedures;
7. Raw data sheets for field sampling and field and laboratory analyses;
8. Documentation of calculations;
9. All data recorded and used to establish parameters for compliance monitoring; and
10. Any other information required by the test method.

9.0 OPEN FLARE REQUIREMENTS

9.1 Open flare specifications. In accordance with ARSD 74:36:07:37, as referenced to 40 CFR § 60.752(b)(2)(iii)(A), a steam assisted, air assisted, or non assisted open flare used to control nonmethane organic compound emissions shall be designed and operated in accordance with the following specifications:

1. The flare shall be designed for and operated with no visible emissions as determined by 40 CFR Part 60, Appendix A, Method 22, except for periods not to exceed a total of five minutes during any two consecutive hours. The observation period for the visible emission evaluation shall be two hours;

2. A flare shall be operated with a flame present at all times. The presence of a flare pilot flame shall be monitored using a thermal couple or any other equivalent device to detect the presence of a flame;
3. The heat content and maximum tip velocity specifications shall be determined by one of the following:
   A. Flares shall be used that have a diameter of three inches or greater, are non assisted, have a hydrogen content of 8.0 percent by volume or greater and are designed for and operated with an exit velocity less than 37.2 meters per second (122 feet per second) and less than the velocity, Vmax, as determined by Equation 9-1.

      Equation 9-1 $$V_{\max} = (X_{H2} - 6.0)x3.9$$

      Where:
      - Vmax = Maximum permitted velocity, meters per second; and
      - X_{H2} = The volume-percent of hydrogen on a wet basis as calculated by using the American Society for Testing and Materials (ASTM) Method D1946-77.

      The exit velocity of the flare shall be determined by subsection 5 of this permit condition; or
   B. Flares shall be used only with the net heating value of the gas being combusted being 300 British thermal units per standard cubic foot or greater if the flare is steam or air assisted or 200 British thermal units per standard cubic foot or greater if the flare is non assisted. The net heating value of the gas being combusted shall be calculated using Equation 9-2:

      Equation 9-2 $$H_T = \left(1.74x10^{-7}\right)\sum_{i=1}^{n} C_i H_i$$

      Where:
      - H_T = Net heating value of the sample, mega joules per standard cubic meter, where the net enthalpy per mole of off gas is based on combustion at 25 degrees Celsius and 760 millimeters mercury, but the standard temperature for determining the volume corresponding to one mole is 20 degrees Celsius;
      - C_i = Concentration of sample component I in parts per million on a wet basis, as measured for organics by 40 CFR Part 60, Appendix A, Method 18 and measured for hydrogen and carbon monoxide by ASTM D1946-77 or 90; and
      - H_i = Net heat of combustion of sample component I, kcal/gram mole at 25 degrees Celsius or less and 760 millimeters mercury. The heats of combustion may be determined using ASTM D2382-76 or 88 or D4809-95 if published values are not available or cannot be calculated.
4. The steam assisted and non assisted flares shall be designed for and operated with an exit velocity, as determined by subsection 5 of this permit condition, less than 18.3 meters per second (60 feet per second), except as provided below:
   A. Steam assisted and non assisted flares designed for and operated with an exit velocity, as determined by subsection 5 of this permit condition, equal to or greater than 18.3 meters per second but less than 122 meters per second (400 feet per second) are allowed if the

net heating value of the gas being combusted is greater than 37.3 Mega joules per standard cubic meter (1,000 Btus per standard cubic foot); and

B. Steam assisted and non assisted flares designed for and operated with an exit velocity, as determined by subsection 5 of this permit condition, less than the velocity, V_{max}, as determined by Equation 9-3 and less than 122 meters per second are allowed.

Equation 9-3 $$Log_{10}(V_{\max}) = (H_T + 28.3)/31.7$$

Where:

- V_{max} = Maximum permitted velocity, meters per second; and
- H_T = Net heating value as determined by Equation 10-2; and

5. The actual velocity of a flare shall be determined by dividing the volumetric flow rate, in units of standard temperature and pressure, as determined by 40 CFR Part 60, Appendix A, Methods 2, 2A, 2C, ,or 2D as appropriate; by the unobstructed cross sectional area of the flare tip; and
6. Air assisted flares shall be designed and operate with an exit velocity less than the velocity, V_{max}, as determined by Equation 9-4.

Equation 9-4 $$V_{\max} = 8.706 + 0.7084xH_T$$

Where:

- V_{max} = Maximum permitted velocity, meters per second; and
- H_T = The net heating value as determined by Equation 10-2.

9.2 Monitoring an open flare. In accordance with ARSD 74:36:07:41, as referenced to 40 CFR § 60.756(c), the owner or operator that uses an open flare shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

1. A heat sensing device such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame; and
2. The owner or operator shall install one of the following devices to record flows to or bypasses of the control device:
   A. Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; or
   B. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

9.3 Initial performance test for open flare. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.8, the owner or operator that uses an open flare to control nonmethane organic compound emissions shall demonstrate compliance with the visibility limit in permit condition 9.1(1) within 180 days of initial startup of the open flare. In accordance with ARSD 74:36:07:37, as referenced to 40 CFR § 60.752(b)(2)(iii), the owner or operator shall use 40 CFR Part 60, Appendix A, Method 22 to determine visible emissions. The observation period for the visible emission evaluation shall be two hours. The flow rate or bypass flow rate shall be

measured during the initial performance test. In addition, the exit velocity shall be determined during the initial performance test.

9.4 Initial startup of open flare. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.5, the owner or operator shall notify the Secretary in writing of the initial startup of the open flare. The written notification will identify the facility name, permit number, this permit condition, and the initial startup date of the open flare. The written notification shall be postmarked within 15 days after the initial startup date.

9.5 Records maintained for open flares. In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.758(c), the owner or operator shall maintain the following records for at least five years:

1. Continuous records of the equipment operating parameters specified to be monitored in permit condition 9.2;
2. Records of the flame or flare pilot flame monitoring specified in permit condition 9.2 and records of all periods of operation in which the flame or flare pilot flame is absent; and
3. Continuous records of the indication of flow to the control device or the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines.

In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.758(b), the owner or operator shall maintain the following data for the life of the open flare as measured during the initial performance test:

1. The flare type (i.e., steam assisted, air assisted, or non assisted);
2. All visible emission readings;
3. Heat content determination;
4. Flow rate or bypass flow rate measurements and exit velocity determinations made during the initial performance test; and
5. Flame or flare flame monitoring and records of all periods of operations during which the flame of the pilot fame is absent.

Records of the open flare vendor specifications shall be maintained until the removal of the open flare.

10.0 ENCLOSED COMBUSTOR REQUIREMENTS

10.1 Enclosed combustor specifications. An enclosed combustor means an enclosed firebox which maintains a relatively constant limited peak temperature generally using a limited supply of combustion air. An enclosed flare, boiler, and process heater are considered an enclosed combustor.

In accordance with ARSD 74:36:07:37, as referenced to 40 CFR § 60.752(b)(2)(iii)(B), an enclosed combustor shall meet the following specifications:

1. An enclosed combustion device shall be designed to reduce nonmethane organic compounds by 98 weight percent or reduce the outlet nonmethane organic compound concentration to less than 20 parts per million by volume, dry basis as hexane at three percent oxygen; or
2. If the enclosed combustor is a boiler or process heater, the boiler or process heater shall be designed to reduce nonmethane organic compounds by 98 weight percent and the landfill gas stream shall be introduced into the flame zone.

The enclosed combustor shall be operated within the parameter ranges established during the initial or most recent performance test.

10.2 Monitoring an enclosed combustor. In accordance with ARSD 74:36:07:41, as referenced to 40 CFR § 60.756(b), the owner or operator that uses an enclosed combustor shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:

1. A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of plus or minus one percent of the temperature being measured expressed in degrees Celsius or plus or minus 0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts;
2. A monitoring device shall be installed on a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts that records the operating rate at least every 15 minutes; and
3. The owner or operator shall install one of the following devices to record flows to or bypasses of the enclosed combustor:
   A. Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the enclosed combustor at least every 15 minutes; or
   B. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

10.3 Initial performance test for enclosed combustors. In accordance with ARSD 74:36:07:37, as referenced to 40 CFR § 60.752(b)(2)(iii)(B), the owner or operator shall demonstrate compliance with the enclosed combustor specifications within 180 days of initial startup of the enclosed combustor. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.754(d), the owner or operator shall use 40 CFR Part 60, Appendix A, Method 25, 25C, or 18 to determine compliance with the 98 weight percent efficiency or 20 parts per million by volume outlet concentration level unless another method to demonstrate compliance has been approved by the Secretary. The owner or operator shall use 40 CFR Part 60, Appendix A, Method 3 or 3A to determine oxygen for correcting the nonmethane organic compound concentration as hexane to three percent. In cases where the outlet concentration is less than 50 parts per million nonmethane organic compound as carbon (8 parts per million nonmethane organic compound as hexane), 40 CFR Part 60, Appendix A, Method 25A should be used in place of 40 CFR Part 60, Appendix A, Method 25. If using 40 CFR Part 60, Appendix A, Method 18, the minimum list of compounds to be tested shall be those published in the most

recent Compilation of Air pollutant emission Factors (AP-42). Equation 10-1 shall be used to calculate the efficiency.

Equation 10-1 $$ControlEfficiency = (NMOC_{in} - NMOC_{out}) / (NMOC_{in})$$

Where:

- $NMOC_{in}$ = mass of nonmethane organic compound entering control device; and
- $NMOC_{out}$ = mass of nonmethane organic compound exiting control device.

10.4 Initial startup of enclosed combustor. In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.5, the owner or operator shall notify the Secretary in writing of the initial startup of the enclosed combustor. The written notification will identify the facility name, permit number, this permit condition, and the initial startup date of the enclosed combustor. The written notification shall be postmarked within 15 days after the initial startup date.

10.5 Records maintained for enclosed combustors. In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.758(c) and (e), the owner or operator shall maintain the following records for at least five years:

1. Continuous records of the equipment operating parameters specified to be monitored in permit condition 10.2;
2. Continuous temperature records for periods of operation during which the parameter boundaries established for an enclosed combustor during the most recent performance test are exceeded. An exceedance is all 3-hour block average periods of operation during which the average combustion temperature was more than 28 degrees Celsius below the average combustion temperature during the most recent performance test at which compliance with the control system specifications were demonstrated. Continuous temperature records are not required for a boiler or process heater with a designed heat input capacity of 44 megawatts or greater;
3. For boilers and process heaters, any change to the location at which the vent stream is introduced into the flame zone;
4. Continuous records of the indication of flow to the enclosed combustor or the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines; and
5. If a boiler or process heater with a designed heat input capacity of 44 megawatts or greater is used to control nonmethane organic compound emissions, the owner or operator shall maintain records of the boiler's or process heater's operating rate during all periods of operation of the boiler or process heater.

In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.758(b), the owner or operator shall maintain the following data for the life of the enclosed combustor as measured during the initial performance test:

1. For enclosed combustors and boilers and process heaters with a design heat input capacity less than 44 megawatts, the average combustion temperature during the performance test, measured at least every 15 minutes and average over the same time period of the performance test;

2. The percent reduction of nonmethane organic compounds achieved by the enclosed combustor as determined in permit condition 10.3; and
3. A description of the location at which the collected gas vent stream is introduced into the boiler or process heater during the initial performance test.

Records of the enclosed combustor vendor specifications shall be maintained until the removal of the control device.

11.0 SURFACE EMISSION MONITORING

11.1 Surface emission monitoring limit. In accordance with ARSD 74:36:07:39, as referenced to 40 CFR § 60.753(d), the owner or operator of a gas collection and control system shall operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route, and the rationale for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

11.2 Surface emission monitoring specifications. In accordance with ARSD 74:36:07:40, as referenced to 40 CFR § 60.755(d), surface emission monitoring equipment shall meet the following instrumentation specifications and procedures:
1. The portable analyzer shall meet the instrument specifications provided in section 3 of 40 CFR Part 60, Appendix A, Method 21, except that “methane” shall replace all reference to volatile organic compound;
2. The calibration gas shall be methane, diluted to a nominal concentration of 500 parts per million in air;
3. To meet the performance evaluation requirements in section 3.1.3 of 40 CFR Part 60, Appendix A, Method 21, the instrument evaluation procedures of section 4.4 of 40 CFR Part 60, Appendix A, Method 21shall be used; and
4. The calibration procedures provide in section 4.2 of 40 CFR Part 60, Appendix A, Method 21 shall be followed immediately before commencing a surface monitoring survey.

11.3 Surface emission monitoring. In accordance with ARSD 74:36:07:40, as referenced to 40 CFR § 60.755(c) and § 60.756(f), the following procedures shall be used for monitoring and determining compliance with the surface methane operational standard:
1. After installation of the collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals or a site-specific established spacing for each collection area on a quarterly basis using an organic vapor analyzer, flame

ionization detector, or other portable monitor meeting the specification in permit condition 11.2;

2. The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells;
3. Surface emission monitoring shall be performed in accordance with section 4.3.1 of 40 CFR Part 60, Appendix A, Method 21, except that the probe inlet shall be placed within five to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions;
4. Any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified below shall be taken. As long as the actions specified below are taken, the exceedance is not considered a violation of this permit:
   A. The location of each monitored exceedance shall be marked and the location recorded;
   B. Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance;
   C. If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again with 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in subsection 4(E) of this permit condition shall be taken. No further monitoring of that location is required until the action specified in subsection 4(E) of this permit condition is taken;
   D. Any location that initially showed an exceedance but has a methane concentration less than 500 parts per million above background at the 10-day re-monitoring specified in subsection 4(B) or 4(C) of this permit condition shall be re-monitored one 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 action specified in subsection 4(C) or 4(E) of this permit condition shall be taken; and
   E. For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the Secretary for approval; and
5. The owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

The first quarterly monitor surface testing shall occur during the quarter in which the gas collection system was activated. 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 readings of 500 parts per million or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

12.0 SOLID WASTE LANDFILL CLOSURE REQUIREMENTS

12.1 Closure notification. In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.757(d), the owner or operator shall submit a closure report within 30 days of waste acceptance cessation. Once a closure report has been submitted, no additional waste may be placed in the landfill without submitting an application to modify this permit 60 days before adding waste to the landfill.

12.2 Capping collection and control system. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.752(b)(2)(v), the owner or operator may cap or remove the collection and control system provided the following requirements are met:

1. The landfill shall be a closed landfill and a closure notification has been submitted;
2. The collection and control system shall have been in operation a minimum of 15 years; and
3. The calculated nonmethane organic compound gas produced by the landfill shall be less than 50 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart and no more than 180 days apart.

12.3 Calculating nonmethane organic compound gas production rate. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.754(b), the owner or operator shall calculate the nonmethane organic compound gas production rate for purposes of determining when the collection and control system can be removed. The calculation shall be based on Equation 12-1.

Equation 12-1

$$M_{NMOC} = 1.89x10^{-3} Q_{LFG} C_{NMOC}$$

Where:

- M_{NMOC} = mass emission rate of nonmethane organic compounds, megagrams per year;
- Q_{LFG} = flow rate of landfill gas, cubic meters per minute; and
- C_{NMOC} = nonmethane organic compound concentration, parts per million by volume as hexane.

The flow rate of landfill gas shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control device using a gas flow measuring device calibrated according to the provisions of section 4 of 40 CFR Part 60, Appendix A, Method 2E. The average nonmethane organic compound concentration shall be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in 40 CFR Part 60, Appendix A, Method 25C or 18. If using 40 CFR Part 60, Appendix A, Method 18, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air pollutant emission Factors (AP-42). The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The landfill owner or operator shall divide the nonmethane organic compound concentration from 40 CFR Part 60, Appendix A, Method 25C by six to convert from nonmethane organic compound concentration as carbon to hexane. The owner or operator may use another method to determine landfill gas flow rate and nonmethane organic compound concentration after receiving written approval from the Secretary.

12.4 Control equipment removal notification. In accordance with ARSD 74:36:07:42, as referenced to 40 CFR § 60.757(e), the owner or operator shall submit an equipment removal report within 30 days prior to removal or cessation of operation of the control equipment. The equipment removal report shall contain the following:

1. A copy of the closure notification;
2. A copy of the initial performance test report, which demonstrates that the 15 year minimum control period has expired; and
3. Dated copies of three successive nonmethane organic compound emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of nonmethane organic compounds per year.

12.5 Permit termination. In accordance with ARSD 74:36:07:34, as referenced to 40 CFR § 60.752(d), when the municipal solid waste landfill is closed, the owner or operator is no longer subject to the requirement to maintain this permit if the landfill meets one of the following conditions:

1. The landfill never met the requirement to install a collection and control system; or
2. The owner or operator has capped or removed the collection and control system.

To terminate this permit, the owner or operator must submit a copy of the closure notification and include the appropriate documentation that demonstrates that the landfill meets one of the above conditions.

13.0 Control of Regulated Air Pollutants

13.1 Visibility limit

In accordance with ARSD 74:36:12:01, the owner or operator may not discharge into the ambient air an air contaminant of a density equal to or greater than that designated as 20 percent opacity from any permitted unit, operation, or process listed in Table 1-1, unless otherwise specified in this permit. This provision does not apply when the presence of uncombined water is the only reason for failure to meet the requirement.

13.2 Visibility exceedances

In accordance with ARSD 74:36:12:02, an exceedance of the opacity limit in permit condition 13.1 is not considered a violation during brief periods of soot blowing, start-up, shutdown, or malfunctions. Malfunction means any sudden and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. A failure caused entirely or in part by poor maintenance, careless operation, preventable equipment breakdown, or any other cause within the control of the owner or operator is not a malfunction and is considered a violation.

13.3 Air emission exceedances – emergency conditions

In accordance with ARSD 74:36:05:16.01(18), the Secretary will allow for an unavoidable emission exceedance of a technology-based emission limit if the exceedance is caused by an emergency condition and immediate action is taken by the owner or operator to restore the operations back to normal. An emergency condition is a situation arising from a sudden and reasonably unforeseeable event beyond the control of the owner or operator, including acts of God. An emergency shall not include an emission exceedance to the extent caused by improperly designed equipment, lack of preventive maintenance,

careless or improper operation, or operator error. The owner or operator shall notify the Secretary within two working days of the incident and take all steps possible to eliminate the excess emissions. The notification must provide a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken. If the notification is submitted orally, a written report summarizing the information required by the notification shall be submitted and postmarked within 30 days of the oral notification.

13.4 Circumvention not allowed

In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.12, the owner or operator may not install, use a device, or use a means that conceals or dilutes an air emission that would otherwise violate this permit. This includes operating a unit or control device that emits air pollutants from an opening other than the designed stack, vent, or equivalent opening.

13.5 Minimizing emissions

In accordance with ARSD 74:36:07:01, as referenced to 40 CFR § 60.11(d), the owner or operator shall at all times, when practicable, maintain and operate all permitted units in a manner that minimizes air pollution emissions

14.0 Flare Operational Requirements

14.1 Flare operational limits

In accordance with ARSD 74:36:20:15(9), as reference to 40 CFR § 60.18(c), (e), (f), the owner or operator shall design and operate the flare as follows:

1. The flare shall be steam-assisted, air-assisted, or non-assisted;
2. The flare shall be designed and operated with no visible emissions as determined by permit condition 14.2, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours;
3. The flare shall be operated with a flame present at all times as determined by permit condition 14.3 when air emissions are vented to the flare;
4. For a non-assisted flare, the owner or operator shall adhere to one of the following:
    a. The flare shall have a diameter of 3 inches or greater, have a hydrogen content of 8.0 percent by volume or greater and designed and operated with an exit velocity less than 37.2 meters per second (122 feet per second) and less than the maximum permitted velocity as determined by permit condition 14.7. The actual exit velocity of the flare shall be determined by permit condition 14.5; or
    b. The flare shall be used only with the net heating value of the gas being combusted being 7.45 Mega Joules per standard cubic meter (200 Btus per standard cubic foot) or greater. The net heat value shall be determined by permit condition 14.4; and
    c. The flare shall be designed for and operated with an exit velocity, as determined by permit condition 14.5, less than 18.3 meters per second (60 feet per second), except as provided as follows:
        i. The flare shall be designed for and operated with an exit velocity, as determined by permit condition 14.5, equal to or greater than 18.3 meters per second (60 feet per second) but less than 122 meters per second (400 feet per second) if the net heating value of the gas being burned is greater than 37.3 Mega Joules per standard cubic meter (1,000 Btus per standard cubic foot); or

ii. The flare shall be designed for and operated with an exit velocity, as determined by permit condition 14.5, less than permitted maximum velocity, as determined by permit condition 25.8, and less than 122 meters per second (400 feet per second);

5. For a steam-assisted or air-assisted flare, operate only with the net heating value of the gas being combusted being 11.2 Mega Joules per standard cubic meter (300 Btus per standard cubic foot) or greater. The net heating value shall be determined by permit condition 14.4;
6. For a non-assisted or steam-assisted flare, operate with an exit velocity of 18.3 meters per second (60 feet per second) or greater as determined by permit condition 14.5 with the following two exceptions:
   a. The exit velocity is greater than 18.3 meters per second (60 feet per second) but less than 122 meters per second (400 feet per second) and the gas being burned is greater than 37.3 Mega Joules per standard cubic meter (1,000 Btus per standard cubic foot).
   b. The exit velocity is less than the maximum permitted velocity as determined by permit condition 25.8 and less than 122 meters per second (400 feet per second); and
7. For air-assisted flares, the flare shall be designed and operated with an exit velocity as determined by permit condition 14.5 less than the maximum permitted velocity as determined by permit condition 14.6.

14.2 Monitoring visible emissions

In accordance with ARSD 74:36:20:15(9), as reference to 40 CFR § 60.18(f)(1), the owner or operator shall monitor the visible emissions from the flare in accordance with 40 CFR Part 60, Appendix A, Method 22.

14.3 Monitoring for a flame

In accordance with ARSD 74:36:20:15(9), as reference to 40 CFR § 60.18(f)(2), the owner or operator shall monitor the presence of a pilot flame for the flare using a thermocouple or any other equivalent device to detect the presence of a flame.

14.4 Monitoring net heating value

In accordance with ARSD 74:36:07:01, as reference to 40 CFR § 60.18(f)(3), the owner or operator shall monitor the net heating value of the gas being combusted by using Equation 14-1.

Equation 14-1 – Calculating net heating value of gas

$$H_t = K\sum_{i=1}^{n} C_i H_i$$

Where:

- H_t = Net heating value of the sample, in mega joules per standard cubic meters;
- C_i = Concentration of sample component I, in parts per million on a wet basis;
- H_i = Net heat of combustion of sample component I, in kilocalories per gram mole at 25 degrees Celsius and 760 millimeters of mercury; and
- K = Constant of 0.000000174 gram mole-mega joules per part per million – standard cubic meters – kilocalorie.

14.5 Determining actual exit velocity

In accordance with ARSD 74:36:20:15(9), as reference to 40 CFR § 60.18(f)(4), the owner or operator shall determine the actual exit velocity by dividing the volumetric flow rate (in units of standard temperature and pressure) as determined by 40 CFR Part 60, Appendix A, Methods 2, 2A, 2C or 2D, as appropriate, by the unobstructed (free) cross sectional area of the flare tip.

14.6 Monitoring maximum permit velocity for air-assisted flares

In accordance with ARSD 74:36:20:15(9), as reference to 40 CFR § 60.18(f)(6), the owner or operator shall monitor the maximum permit velocity for air-assisted flares using Equation 14-2.

Equation 14-2 – Calculating maximum permit velocity for air-assisted flares

$$V_{\max} = 8.706 + (0.7084)(H_t)$$

Where:

- V_{max} = Maximum permit velocity; and
- H_T = Net heating value as determined by permit condition 14.4.

14.7 Determining maximum permit velocity for non-assisted flares

In accordance with ARSD 74:36:20:15(9), as reference to 40 CFR § 60.18(c)(3)(i)(A), the maximum permit velocity for non-assisted flares shall be determined using Equation 14-3.

Equation 14-3 – Calculating maximum permit velocity for non-assisted flares

$$V_{\max} = (X_{H2} - K_1)(K_2)$$

Where:

- V_{max} = Maximum permit velocity, in meters per second;
- X_{H2} = Volume percent of hydrogen on a wet basis as calculated using American Society for Testing and Materials (ASTM) Method D1946-77;
- K_1 = Constant, 6.0 volume percent hydrogen; and
- K_2 = Constant, 3.9 meters per second per volume percent hydrogen.

14.8 Determining maximum permit velocity for non-assisted flares

In accordance with ARSD 74:36:20:15(9), as reference to 40 CFR § 60.18(f)(5), the owner or operator shall determine the maximum permit velocity for non-assisted flares complying with subparagraph (4)(c)(ii) using Equation 14-4.

Equation 14-4 – Calculating maximum permit velocity for non-assisted flares

$$Log_{10}(V_{\max}) = \frac{(H_t + 28.8)}{31.7}$$

Where:

- V_{max} = Maximum permit velocity, in meters per second;
- 28.8 = Constant;
- 31.7 = Constant; and
- H_T = Net heating value as determined by permit condition 14.4.