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air quality desert conservation PROGRAM sustainability

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PART 70 PERMIT
TECHNICAL SUPPORT DOCUMENT
(STATEMENT of BASIS)

APPLICATION FOR:
Part 70 Source Operating Permit Renewal with Significant Revision

SUBMITTED BY:
TriAD Environmental Consultants &
SCS Engineers

FOR:
Sunrise Municipal Solid Waste Landfill
Source ID: 15033

LOCATION:
1 1/2 Miles east of the intersection of Vegas Valley Drive and Hollywood Boulevard
Las Vegas, Nevada 89142

SIC code 4953, "Refuse Systems"
NAICS code 562212, "Solid Waste Landfill"

September 28, 2022

EXECUTIVE SUMMARY

Sunrise Municipal Solid Waste Landfill (Sunrise Landfill), is a major source for SO_2 and a minor source for PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, HAP, H_2S, and NMOC. The source is under SIC Code 4953 – Refuse Systems (NAICS Code 562212 – Solid Waste Landfill) and is located 1½ miles East of the intersection of Vegas Valley Drive and Hollywood Boulevard, Las Vegas, Nevada 89142 (T21S, R62E, Sections 1 and 12) in the Las Vegas Valley Hydrographic Area 212. Las Vegas Valley is classified as a marginal nonattainment area for the 2015 ozone (O_3) NAAQS and an attainment area for all other regulated air pollutants. Hydrographic Area 212 is subject to a maintenance plan for the CO and PM_{10} NAAQS.

Sunrise Landfill served as the primary municipal solid waste landfill (MSWL) for Clark County from 1951 until October 8, 1993. In 1993 the landfill stopped accepting waste and was permanently closed. Sunrise Landfill is currently collecting landfill gases (LFG) consisting of methane, non-methane organic compounds (NMOC), hazardous air pollutants (HAPs), and H_2S generated as a result of anaerobic bacterial decomposition of the organic materials in the solid waste. Sunrise Landfill is also identified as a source for greenhouse gases (GHGs). The landfill operates a landfill gas collection system and an open combustion flare with a minimum destruction efficiency of 98%.

The following table summarizes the source potential to emit for each regulated air pollutant from all emission units addressed by this Part 70 source. Sunrise Landfill is neither a categorical stationary source as defined in AQR 12.2.2(j) nor does it belong to any other stationary source category which, as of August 7, 1980, is being regulated under Section 111 or 112 of the Act. Therefore, fugitive emissions are not included in source status determination.

Table 1: Source-wide PTE (tons per year)

Pollutant	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAPs	H_2S	NMOC	GHG
PTE with Existing Flare	4.18	4.18	10.03	62.67	249.20	8.93	6.69	44.73	22.90	58,353.29
PTE with New Flare	2.23	2.23	8.13	37.07	249.20	8.27	8.70	44.73	21.21	30,583.48
Major Source Thresholds (Major Part 70)	100	100	100	100	100	100	10/25	-	-	-
Major Stationary Source Thresholds (PSD/Nonattainment)	250	250	100[1]	250	250	100[1]	10/25	-	-	-

[1] Nonattainment

The Clark County Department of Environment and Sustainability, Division of Air Quality, has been delegated the authority to implement the requirements of the Part 70 operating permit program.

Based on the information submitted by the applicant and a technical review performed by the DAQ staff, DAQ proposes the issuance of a Part 70 Operating Permit to Republic Silver State Disposal, Inc., Sunrise Municipal Solid Waste Landfill.

The Landfill is subject to 40 CFR Part 62, Subpart OOO and 40 CFR Part 63, Subpart AAAA.

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I. ACRONYMS

Table I-1: List of Acronyms

Acronym	Term
AQR	Clark County Air Quality Regulation
ATC	Authority to Construct
CF	control factor
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DAQ	Division of Air Quality
DES	Clark County Department of Environment and Sustainability
DOM	date of manufacture
dscf	dry standard cubic feet
dscm	dry standard cubic meter
EF	emissions factor
EPA	U.S. Environmental Protection Agency
EU	emission unit
g/gr	Gram
GCCS	Gas Collection and Control System
GHG	greenhouse gas
HA	Hydrographic Area
HAP	hazardous air pollutant
hp	Horsepower
kW	kilowatt
LFG	Landfill gas
MSW	Municipal Solid Waste
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NMOC	non-methane organic compound
NO_x	nitrogen oxides
$PM_{2.5}$	particulate matter less than 2.5 microns
PM_{10}	particulate matter less than 10 microns
PSD	Prevention of Significant Deterioration
PTE	potential to emit
RACT	Reasonably Achievable Control Technology
RT	round trip
SCC	Source Classification Code
SNHD	Southern Nevada Health District
SIC	Standard Industrial Classification
SO_2	sulfur dioxides
VMT	vehicle miles traveled
VOC	volatile organic compound

II. SOURCE INFORMATION

A. GENERAL

Permittee:	Republic Silver State Disposal Inc.
Mailing Address:	770 East Sahara Avenue, Las Vegas, Nevada 89104
Responsible Official:	David Vossmer
Phone Number:	702-599-5901
Contact Person:	Jessica Preston
Phone Number:	702-599-5901

B. DESCRIPTION OF PROCESS

Existing Flare (EU: A01)

Sunrise Landfill is actively collecting landfill gases consisting of CH_4, NMOC, HAPs, and H_2S generated as a result of anaerobic bacterial decomposition of the organic materials in the solid waste. The landfill (EU: A01) operates a landfill gas collection system and a non-assisted combustion flare with open flare design capable of burning 57.24 MMBtu/hr or 501,422 MMBtu/yr of collected landfill gases. There are 34 collection wells, of which 23 are active at this time. The collection system is designed to capture up to 1,908 scfm (~75% capture efficiency) of landfill gas and 640 scfm (~25%) is calculated as fugitive emission (EU: A02). The collected gases, which are from the decomposing waste, are burned by a flare that serves as the control device. The collection and control system reduces the amount of fugitive emissions from the landfill and overall emissions. There have been many studies indicating that landfills in dry arid areas generate less than the default EPA emission estimates. This is due to a lack of moisture in the refuse, which reduces microbial decomposition of the waste.

The composition of landfill gas is typically 50% carbon dioxide and 50% methane, with trace amounts of non-methane organic compounds. Typical fugitive emissions generated from decomposing wastes in landfill include CH_4, NMOC (expressed as hexane), HAPs, VOCs, and H_2S. Sunrise Landfill has a higher percentage of H_2S gas that is generated from a typical landfill. The specific emission generation potential for each landfill varies depending on site specific conditions such as humidity, rainfall, landfill depth, soil pH, temperature, as well as the types of waste deposited in the landfill. These emissions are fugitive until a collection and control system is added.

The wells are located throughout the productive areas of the 750 acre site. The collection wells are connected to a central collection header in a phased approach, which directs gas to the flare-blower station. The collection system has a blower capable of drawing 3,000 scfm from the extraction well network. The collected gas is passed through a knock out drum to remove most remaining condensate before entering the combustion flare. The modeled flare operates at a minimum temperature of 1,400 °F, which is sufficient to achieve at least a 98% destruction efficiency of the targeted pollutants. Collateral combustion emissions from the flare burner are NO_x, SO_2, CO, PM_{10}, and $PM_{2.5}$.

The flare is equipped with a programmable logic control system or equivalent control system. The control system will automatically activate the propane pilot system. Upon successful ignition, the blowers will be activated and the landfill gas will ignite the flare. In the event of flare-outs, the gas flow will be stopped until re-ignition occurs.

The following items will operate as part of the flare control system:

- Gas flow meter
- Thermocouples to sense minimum high and low temperature alarm conditions
- Chart recorder for the temperature and gas flow
- Automatic propane system
- Automatic blower controls.

Table II-B-1 lists the emission units covered by this operating permit.

Table II-B-1: Summary of Emission Units

EU	Description	Rating	Make	Model #	Serial #	SCC
A01	Landfill Gas Collection and Combustion Flare, Non-Assisted, Open Flare Design	57.24 MMBtu/hr	LFG Specialties, LLC	PCF1230110	1700	50100410
A02	Landfill Fugitive Emissions	N/A	N/A	N/A	N/A	50100402

New Flare (EU: A03)

On May 18, 2021, permittee submitted an Authority to Construct (ATC) and Title V Modification application to add a new landfill gas (LFG) blower and flare system (BFS) to replace the existing LFG flare system. Due to decreasing LFG generation associated with a closed landfill, there is not enough BTU's to consistently operate the existing flare. Therefore, with the installation of the replacement flare, the current LFG control system will be replaced with a system designed and sized for the amount of LFG currently being collected.

The landfill characteristics will remain the same as listed in the existing flare description except for the following:

1) The new flare design is capable of burning 27.3 MMBtu/hr or 239,148 MMBtu/yr of collected landfill gases;
2) The new flare has a manufacturer designed rating of 1,000 scfm;
3) The collection system has a blower capable of drawing 1,000 scfm from the extraction well network.

Table II-B-2: Summary of Emission Units

EU	Description	Rating	Make	Model #	Serial #	SCC
A03	Landfill Gas Collection and Combustion Flare, Non-Assisted, Open Flare Design	27.3 MMBtu/hr	John Zink	ZNIX	TBD	50100410
A02	Landfill Fugitive Emissions	N/A	N/A	N/A	N/A	50100402

C. PERMITTING HISTORY

The current operating permit was issued on February 3, 2016. There was no permitting action for this source since then.

D. CURRENT PERMITTING ACTION

Renewal Application – August 3, 2020

Sunrise Landfill submitted a Part 70 OP renewal application on August 3, 2020. This application is seeking to implement key language in the renewed permit that will allow the facility to implement any revised limit following the September 27, 2021 deadline. The September 27, 2021 deadline is incorporated in the permit to remove the SSM reporting.

The source also requested to reduce the frequency of surface methane emission monitoring to annually as a result of the historic surface emissions sampling events whereby no exceedance of the operational standard has occurred in over 3 consecutive quarterly sampling events. The surface methane monitoring was incorporated into a long-term operation and maintenance plan as a result of an EPA consent decree. Since the plan was approved by EPA, the source will have to petition EPA and obtain their approval to change and/or reduce the frequency of the surface monitoring before it can be updated in the permit.

The Part 70 OP renewal application also stated that the landfill was subject to the new NSPS for landfills, Subpart Cf. The emission guidelines are not delegated to the state and local agencies in the same way as 40 CFR parts 60, 61, and 63 standards. Subpart Cf emission guidelines establish standards the States must develop and submit in a State plan. If a State plan is not approved, the EPA will develop a federal plan. Clark County does not have an approved State plan for Subpart Cf and will be subject to the federal plan once it is finalized (unless a plan is submitted and approved before then). Thus, there was no applicable requirement under Subpart Cf as of May 21, 2021. Supplemental information was submitted in regards to NSPS Cf applicability on March 24, 2021.

On May 21, 2021, EPA published the final federal plan for existing municipal solid waste landfills. Affected landfills must comply with all applicable standards and monitoring, recordkeeping, and reporting requirements as of the effective date of this rule June 21, 2021. This final action establishes an MSW Landfills Federal Plan to implement the 2016 MSW Landfills EG (Subpart Cf) for those states that do not presently have an approved state plan. Therefore; the requirements under 40 CFR Part 62, Subpart OOO will be incorporated in this Title V renewal.

Significant Revision to the Operating Permit – May 18, 2021

The source has submitted this application to replace the existing flare due to decreasing LFG generation associated with the closed landfill. The source has stated that there is not enough BTU to consistently operate the existing flare. The current flare will be taken out of service as soon as the new flare is operable. Both flares will never operate at the same time. The new flare will be located immediately adjacent to the existing flare in the southeast area of the landfill. New operating parameters will be incorporated in this OP for the replacement landfill flare along with a reporting requirement to notify DAQ when the new flare has started operation.

Reopening for Cause

The Department of Environment and Sustainability, Division of Air Quality (DAQ) has identified this source as possibly emitting 25 tons or more of actual emissions for oxides of nitrogen (NO_X) and/or volatile organic compounds (VOCs) in any calendar year. Clark County was required to implement Section 182(a)(3)(B) of the Clean Air Act (CAA) which requires all ozone nonattainment areas to have in place a program that requires emissions statements from stationary sources of NO_X and/or VOCs.

Section 12.9.1 of the Clark County Air Quality Regulations (AQRs) codifies this requirement for Clark County and states the following:

a. The Responsible Official of each Stationary Source that emits 25 tons or more of NO_X and/or VOC shall submit an Annual Emissions Statement (Statement) to the department for the previous calendar year.

b. Pursuant to CAA Section 182, the Statement must include all actual emissions for all NO_X and VOC emitting activities.

c. The Statement shall be submitted to and received by the department on or before March 31 of each year or other date, upon prior notice by the Control Officer, and shall include a certification that the information contained in the Statement is accurate to the best knowledge of the individual certifying the Statement.

A condition requiring submittal of annual emission statement has been included in the permit.

Reopening for Cause – September 2, 2021

This source is an existing major source that has a Title V operating permit. The Division of Air Quality (DAQ) had sent a letter to the source notifying a reopening for cause to revise the permit pursuant to Sections 12.5.2.15 of the Clark County Air Quality Regulations (AQR), which maintain that the Control Officer may reopen and revise a permit "to assure compliance with the applicable requirements".

AQR Sections 92 (Fugitive Dust from Unpaved Parking Lots and Storage Areas) and 94 (Permitting and Dust Control for Construction Activities) were recently revised to address fugitive dust at stationary sources. The revised regulations became effective on August 17, 2021. Subsections 92.1(c) and 94.1.1(a) require that the control measures and stabilization standards therein be made enforceable by the terms and conditions of the stationary source permit.

DAQ is in the process of revising the regulation for clarification on applicability for stationary sources. DAQ has decided not to include AQRs 92 and 94 requirements in the permit at this time.

The renewed Part 70 OP will incorporate all actions since the last Part 70 OP.

Source comments were received on March 3, 2022. DAQ responded to the comments and requested a meeting to appropriately address outstanding issues. The source response with additional comments was received on April 28, 2022. The source and DAQ had a meeting on July 7, 2022 to address all remaining issues. The following is the result of the meeting:

1) Discussion of fugitive H_2S- The source questioned the need for including fugitive emissions in the facility PTE. DAQ explained that the fugitive emissions are included in the facility PTE as per Clark county AQRs.
2) Condition 4.1.14 - using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD) is an example of equipment used to monitor H_2S. DAQ explained that this detector was mentioned in some reports submitted by the source. DAQ stated that any test methods that are accepted in the industry and by EPA may be used to monitor H_2S in LFG. The source was okay to leave this condition in the permit.

3) H_2S monitoring frequency in the current permit versus the draft permit – the current permit requires analyzing H_2S annually and reporting H_2S emissions semiannually due to the limit on SO_2 emissions. These records are on the basis of a consecutive 12-month total and require monthly calculations. Therefore, the H_2S annual analysis has been replaced with a monthly analysis in the draft permit. The source was performing H_2S analyses on a voluntary quarterly basis. It was decided to retain the requirement of a monthly H_2S analysis in the draft permit. However, DAQ agreed to incorporate a condition which will allow the source to change this frequency if enough data is provided that indicates a decline in the ppm of H_2S.
4) As far as Supbart AAAA becoming the primary regulation going forward, 40 CFR Part 62, Subpart OOO does have an "opt-in" provision. In order to use this provision, the source will have to petition EPA to change their Long-Term Maintenance Plan dated 2014 that resulted from a consent decree. DAQ recognizes that the opt-in provisions allow landfills to follow one set of operational, compliance, monitoring, and reporting provisions for pressure and temperature the source chose. The opt-in provisions are not fully being processed at this time because of certain operational restrictions identified in the 2014 plan. DAQ will incorporate conditions in the permit that states if the Long-Term Operation and Maintenance Plan is revised the source can operate under the provisions of the revised plan. All other requirements will be retained from the existing permit accordingly.
5) As far as the applicable federal regulations are concerned, 40 CFR 62 Subpart OOO and 40 CFR 63 Subpart AAAA regulations are being truncated in the permit. Therefore, the source is subject to Subpart OOO and Subpart AAAA regulations.
6) The emission unit description for the existing flare stated air-assisted. During this permitting action, the source commented that the flare is and has always been a non-assisted flare. The source claims that this difference in technology has no bearing on the control efficiency of the flare. This description is being changed in this action to non-assisted.
7) All other comments from the correspondence was addressed.

As a result of this meeting, the permit will be updated accordingly. DAQ will provide a copy of the updated draft permit to the source for review before public notice.

E. ALTERNATE OPERATING SCENARIO

This Title V OP is issued to address operating scenarios with the existing flare until the proposed 1,000 cfm flare is installed and made operational.

There is no other alternative operating scenario approved through this proposed permit.

III. EMISSIONS INFORMATION

A. SOURCE-WIDE PTE

Existing Flare (EU: A01)

Sunrise Landfill is a major source for SO_2 and a non-major source for PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, HAP, H_2S, and NMOC.

Table III-A-1: Source-wide PTE (tons per year)

Pollutants	$PM_{10}/PM_{2.5}$	NO_x	CO	SO_2	VOC[1]	HAPs	H_2S	NMOC[2]
Flare Stack	4.18	10.03	62.67	249.20	0.26	2.11	0.40	0.67
Total Non-Fugitive PTE	**4.18**	**10.03**	**62.67**	**249.20**	**0.26**	**2.11**	**0.40**	**0.67**
Fugitive Emissions from Landfill Gas[2]	0	0	0	0	8.67	4.58	44.33	22.23
PTE Totals	**4.18**	**10.03**	**62.67**	**249.20**	**8.93**	**6.69**	**44.73**	**22.90**

[1]VOC emissions comprise 39% of the NMOC in landfills (Reference: AP-42, Table 2.4-2; revised 11/98).
[2]NMOC are non-methane organic compounds, expressed as hexane.

Table III-A-2: Source Potential to Emit (pounds per hour)

EU	Description	$PM_{10}.PM_{2.5}$	NO_x	CO	SO_2	VOC[1]	HAP	NMOC[2]	H_2S
A01	Flare Stack	0.95	2.29	14.31	56.90	0.06	0.48	0.15	0.09
A02	Fugitives	0	0	0	0	1.98	1.05	5.08	10.12
Totals		**0.95**	**2.29**	**14.31**	**56.90**	**2.04**	**1.53**	**5.23**	**10.21**

[1]VOC emissions comprise 39% of the NMOC in landfills (Reference: AP-42, Table 2.4-2; revised 11/98).
[2]NMOC are non-methane organic compounds, expressed as hexane.

New Flare (EU: A03)

After the replacement of the flare, Sunrise Landfill will continue to be a major source for SO_2 and a non-major source for PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, HAP, H_2S, and NMOC.

Table III-A-3: Source-wide PTE (tons per year) Upon Flare Replacement

Pollutants	$PM_{10}/PM_{2.5}$	NO_x	CO	SO_2	VOC[1]	HAPs	H_2S	NMOC[2]
Flare Stack	2.23	8.13	37.07	249.20	0.12	1.08	0.40	0.31
Total Non-Fugitive PTE	**2.23**	**8.13**	**37.07**	**249.20**	**0.12**	**1.08**	**0.40**	**0.31**
Fugitive Emissions from Landfill Gas[2]	0	0	0	0	8.15	7.62	44.33	20.90
PTE Totals	**2.23**	**8.13**	**37.07**	**249.20**	**8.27**	**8.70**	**44.73**	**21.21**

[1]VOC emissions comprise 39% of the NMOC in landfills (Reference: AP-42, Table 2.4-2; revised 11/98).
[2]NMOC are non-methane organic compounds, expressed as hexane.

Table III-A-4: Source Potential to Emit (pounds per hour) Upon Flare Replacement

EU	Description	$PM_{10}.PM_{2.5}$	NO_x	CO	SO_2	VOC[1]	HAP	NMOC[2]	H_2S
A03	Flare Stack	0.51	1.86	8.46	56.90	0.03	0.34	0.07	0.09
A02	Fugitives	0	0	0	0	1.86	2.44	4.77	10.12
Totals		**0.51**	**1.86**	**8.46**	**56.90**	**1.89**	**2.78**	**484**	**10.21**

[1]VOC emissions comprise 39% of the NMOC in landfills (Reference: AP-42, Table 2.4-2; revised 11/98).
[2]NMOC are non-methane organic compounds, expressed as hexane.

B. EMISSIONS CALCULATIONS

Existing Flare (EU: A01)

No emission calculations have changed since the original TSD dated July 2002 found in 15033_20040816_TSD file. These calculations established the emissions from the total waste in place of 18,831,000 tons or 17,083,000 mega grams. The types of material the landfill accepted over its active life included municipal solid waste, petroleum contaminated soil, asbestos, construction debris, sewage sludge, septic waste, medical waste, and dead animal waste.

New Flare (EU: A03)

The flare emissions from the stack were computed based on the following emission factors:

Table III-B-1: Emission Factors

Pollutants	Emission Factor	Data Source
NO_x	0.068 lb/MMBtu	Manufacturer's guarantee
CO	0.31 lb/MMBtu	Manufacturer's guarantee
NMOC	0.66 lb/MMBtu or 98% DRE	Manufacturer's guarantee
VOC	39% of NMOC	AP-42 Section 2.4
$PM_{10}/PM_{2.5}$	17 lb/MMft^3 as methane	AP-42 Section 2.4-5
SO_2	Using existing emissions of 249.20	

The source used LandGEM model to calculate the emissions using the emission factors listed in Table III-B-1.

PTE Calculations:

Due to wide fluctuations of H_2S concentration in the landfill gas, the permittee requested the existing SO_2 and H_2S PTE to remain same in the revised permit.

H_2S: 5,730 ppm @ 1000 scfm (75%) = 249.20 tons of SO_2 per year from the flare.
H_2S: 5,730 ppm @ 333 scfm (25%) = 44.33 tons of H_2S per year fugitive.

Applicability Calculations:

The source's applicability emissions for SO_2 and H_2S were derived from the following methodology.

7,100 ppm - H_2S data from the 2020 semiannual reports submitted to DAQ was averaged for that year.
H_2S: 7,200 ppm @ 1000 scfm (75%) = 309.10 tons of SO_2 per year from the flare
H_2S: 7,200 ppm @ 333 scfm (25%) = 55.0 tons of H_2S per year fugitive

Total H_2S is estimated to be 55.0 tons (fugitive) + 0.50 (controlled from the flare) =55.5 tons per year.

The results from these calculations indicate that 249.20 tons of SO_2 and 44.33 tons of H_2S are limits. The source must monitor the ppm for H_2S monthly. The monthly ppm along with the flow rate from the monthly monitored landfill gas will be utilized to calculate the actual emissions.

C. OPERATIONAL LIMITS

Operational limits based on existing flare (EU: A01) and the new flare (EU: A03) are separately identified in the permit.

D. CONTROL TECHNOLOGY

On October 1, 2001, Sunrise Landfill submitted a "Pollution Control Project Exclusion Request" for the installation of a combustion flare at the Sunrise Landfill. The exclusion was sought from the major New Source Review process. Without the exclusion, the landfill may have been required to install additional controls in excess of the gas collection and combustion flare, i.e., a pollution control device on a pollution control device.

The landfill was required, pursuant to Federal Emission Guidelines, 40 CFR 60 Subpart Cc and EPA Administrative Order 7003-09-99-0005, to install a gas collection system and combustion flare to burn off landfill gases, within 30 months of a Tier I report submittal of landfill emissions. The landfill did not seek an exclusion from the installation of the gas collection and combustion flare system and continues to operate these.

No pollutants trigger a control technology analysis under NSR.

Existing Flare (EU: A01)

The landfill gas will be directed to a combustion flare where 98% to 99.7% of the target pollutants present in the gas will be destroyed. Flare temperatures will be maintained at a minimum set point of 1,400 °F in order to ensure that destruction remains within the calculated parameters for each pollutant. At a minimum, the flare will be maintained and operated in accordance with 40 CFR 60.18.

New Flare (EU: A03)

The landfill gas will be directed to a flare where 98% to 99.7% of the target pollutants present in the gas will be destroyed. At a minimum, the flare will be maintained and operated in accordance with 40 CFR 60.18.

E. MONITORING

Sunrise Landfill is subject to 40 CFR §62 Subpart OOO -Federal Plan Requirements for Municipal Solid Waste Landfills That Commenced Construction On or Before July 17, 2014 and Have Not Been Modified or Reconstructed Since July 17, 2014. The facility, in accordance with Subpart OOO, has installed a Gas Collection and Control System (GCCS) that was designed to capture approximately 75% of the landfill gases. The remaining 25% of the landfill gases are considered fugitive emissions. The open combustion flare is operated in a manner that achieves at least a 98% destruction efficiency of the target pollutants, where the collateral combustion emissions from the combustion flare burner will include NO_x, SO_2, CO, and PM_{10}.

Sunrise Landfill, in order to comply with 40 CFR §62 Subpart OOO must monitor the GCCS and the combustion flare for efficiency, monitor and analyze gases from the GCCS, and monitor fugitive gases from the surface of the landfill. Each wellhead of the GCCS must have sampling ports, thermometers, and pressure gauges. On a monthly basis nitrogen, oxygen, and the temperature must be monitored to ensure that these parameters are within regulated limits.

At the gas collection header of the GCCS, Sunrise Landfill utilizes a pressure gauge. On an annual basis landfill gas is collected and analyzed for NMOC, methane, and H_2S. On a quarterly basis, surface methane monitoring is also performed. Using these results the source must demonstrate that at least 75% of the pollutants are being collected and going to the combustion flare. Sunrise Landfill must measure landfill gas temperatures at each wellhead of the GCCS to ensure they are within acceptable limits. The LFG flow rate to the combustion flare must be monitored and recorded, at a minimum, every 15 minutes. The bypass flow to the combustion flare must have a lock and key configuration and be visually inspected monthly. Quarterly inspections for visible emissions must be performed. The combustion flare must have a heat sensing device at the pilot light to indicate the continuous presence of a flame.

The fugitive emissions at the surface of the landfill must be monitored quarterly to demonstrate that the methane levels do not go over the regulated amount of 500 ppm from the background. The facility must check the integrity of the landfill cover and implement repairs as necessary on a monthly basis.

The required monitoring requirements will be performed using methods listed in Table III-E-1:

Table III-E-1: Monitoring Requirements

Regulation	Compliance Standard	Method	Frequency
40 CFR Part 62 Subpart OOO/MACT AAAA	Levels less than 20% Nitrogen or 5% Oxygen at each well	Method 3C	Monthly
	Landfill gas temperature		Monthly
	Surface monitoring (500 ppm)		Quarterly
	Flow rate and exit velocity	Method 2E	Quarterly
	Net heating value (Btu Analysis)	Method 3C	Quarterly
40 CFR 60.18	Opacity	Method 22	Quarterly
40 CFR Part 62 Subpart OOO/MACT AAA	Methane	Method 21	Quarterly
Permit Condition	H_2S ppm	ASTM D5504	Monthly

F. PERFORMANCE TESTING

All performance tests shall be conducted in accordance with 40 CFR 60 Appendix A – Test Methods, Air Quality Performance Testing Frequency Guidelines (as revised), and Air Quality Guideline on Performance Testing (as revised). Sunrise Landfill is responsible for complying with all applicable performance testing requirements in these standards and guidelines, regardless of whether this permit includes conditions corresponding to every specific requirement. This required performance testing will be performed using methods listed in Table III-F-1. The initial performance tests for the gas flow and heat rating (Btu) of the combustion flare was completed in April 2004. The initial performance testing for surface monitoring of fugitive emissions was completed on May 2002. Additional required testing will be performed using the following methods at the listed frequency:

Table III-F-1: Performance Testing Protocol Requirements

EU	Description	NSPS Applicability	Compliance Standard	Performance Test	Frequency
A01/A03	Landfill Gas Collection and Combustion Flare, Non-Assisted, and Open	40 CFR Part 62 Subpart OOO and 40 CFR Part 63 Subpart AAAA	Flow rate and exit velocity	Method 2E	Annually
			Net heating value (Btu Analysis)	Method 3C	Annually
			NMOC	Method 18 or Method 25C	Annually
			Opacity	Method 22	Annually

G. RACT ANALYSIS

A RACT analysis has not been required because this landfill is closed and the proposed change of the existing flare does not result in an increase in any of the regulated air pollutants.

IV. REGULATORY REVIEW

A. LOCAL REGULATORY REQUIREMENTS

DAQ has determined that the following public laws, statutes, and associated regulations are applicable:

1. Nevada Revised Statutes, Chapter 445, Sections 401 through 601;

2. The portions of the AQRs in the Nevada State Implementation Plan (SIP) that cover Clark County. SIP requirements are federally enforceable. All requirements from ATC permits issued by DAQ are federally enforceable because these permits were issued pursuant to SIP-included sections of the AQRs; and

3. Portions of the AQRs not included in the SIP. These locally applicable requirements are locally enforceable only.

A complete list of applicable AQRs is included in the permit.

B. FEDERALLY APPLICABLE REGULATIONS

1. CAAA (authority: 42 U.S.C. § 7401, et seq.);

2. Title 40 of the CFRs, including 40 CFR Part 70;

60.18 General control device and work practice requirements.

(a)(1) This section contains requirements for control devices used to comply with applicable subparts of 40 CFR parts 60 and 61. The requirements are placed here for administrative convenience and apply only to facilities covered by subparts referring to this section.

Discussion: The source owns and operates a flare at this source. Therefore; the flare is subject to requirements in this regulation that have been specified in the permit.

See 60.18 PDF attachment.

40 CFR Part 62, Subpart OOO—Approval and Promulgation of State Plans for Designated Facilities and Pollutants

§62.16710 Scope and delegated authorities.

This subpart establishes emission control requirements and compliance schedules for the control of designated pollutants from certain designated municipal solid waste (MSW) landfills in accordance with section 111(d) of the Clean Air Act and subpart B of 40 CFR part 60.

(a) If you own or operate a designated facility as described in §62.16711, then you must comply with this subpart.

Discussion: This source is a municipal solid waste landfill located in a state, locality, or portion of Indian country that submitted a negative declaration letter is not subject to the requirements of this subpart other than the requirements in the definition of design capacity in §62.16730 to recalculate the site-specific density annually and in §62.16724(b) to submit an amended design capacity report in the event that the recalculated design capacity is equal to or greater than 2.5 million megagrams and 2.5 million cubic meters. However, if the existing municipal solid waste landfill already has a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, then it is subject to the requirements of this Federal plan. Applicable requirements in this regulation have been incorporated into the permit.

It is noted that the Part 70 Operating Permit Renewal Application chose to Opt-In to the requirements of Subpart AAAA, but the provisions to opt-in were not applicable until the 40 CFR Part 62, Subpart OOO was finalized on May 21, 2021. Therefore, the first renewal draft was not changed to the applicable requirements of Subpart AAAA. Since, EPA comments warrant to review monitoring conditions from the first review, this permit was not issued and another public notice is required. This renewal reflect the temperature change from 55 degrees to 62.8 degrees. Therefore, in accordance with the following:

Section 62.16716 (Operational Standards for Collection and Control Systems): Once the owner or operator begins to comply with the provisions of § 63.1958, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of this section;

Section 62.16720 (Compliance Provisions): Once the owner or operator begins to comply with the provisions of § 63.1960, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of this section; and

Section 62.16722 (Monitoring of Operations): Once the owner or operator begins to comply with the provisions of § 63.1961, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of this section.

See Plan OOO PDF attachment.

63.11 General control device and work practice requirements.

(a) Applicability.

(1) The applicability of this section is set out in § 63.1(a)(4).

(2) This section contains requirements for control devices used to comply with applicable subparts of this part. The requirements are placed here for administrative convenience and apply only to facilities covered by subparts referring to this section.

Discussion: The source owns and operates a flare at this source. Therefore; the flare is subject to requirements in this regulation that have been specified in the permit.

See 63.11 PDF attachment.

40 CFR Part 63 (NESHAP), Subpart AAAA—Municipal Solid Waste Landfills

§63.1935 Am I subject to this subpart?

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

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

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

(3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to §63.1959.

Discussion: The source is a MSW landfill that is an area source This landfill has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to §63.1959. Therefore, the landfill is subject to the requirements of this Federal plan. Applicable requirements in this regulation have been incorporated into the permit.

See MACT AAAA PDF attachment.

40 CFR Part 64—Compliance Assurance Monitoring.

40 CFR Part 64.2: Applicability.

Discussion: The Compliance Assurance Monitoring (CAM) program is codified in 40 CFR Part 64. CAM requirements apply to any pollutant specific emissions unit with uncontrolled potential emissions above the major source threshold (100 tons/year) that uses a control device to achieve compliance with an emission limitation or standard. The landfill has a potential to generate H_2S above 100 tons/year and the source is using a control devise. However, the control device is not used to comply with an emission limit or standard. Therefore, CAM is not applicable to H_2S. SO_2 is a post control pollutant and is generated after the combustion of H_2S. This source does not emit pollutants above the major source threshold. CAM does not apply for any emission unit included in this Part 70 operating permit.

V. PERMIT SHIELD

None has been identified in this permitting action.

VI. COMPLIANCE

A. COMPLIANCE CERTIFICATION

Monitoring requirements are to be included for specified requirements in the permit.

Recordkeeping requirements are to be met for all limitations specified in the permit.

Reporting requirements remain the same from the previous permit and the ATC.

B. SUMMARY OF MONITORING FOR COMPLIANCE

Table VI-B-1: Compliance Monitoring

EU	Process Description	Monitored Pollutants	Applicable Subsection Title	Requirements	Compliance Monitoring
A01/A03	Landfill Gas Collection and Combustion Flare, Non-Assisted, and Open	CO NO_x SO_2 PM_{10} VOC CH_4 NMOC HAPs H_2S	AQR Sections 12, 40 CFR § 60.18, 40 CFR § 62 Subpart OOO and 40 CFR § 63 Subpart AAAA	Measure the pressure, monitor the nitrogen or oxygen concentration, and monitor temperature of landfill gas. Measure the pressure in the gas collection header. Measurements of gas flow rate. Btu content of landfill gas. Surface monitoring Visible emissions. Chemical testing of landfill gases for CH_4. Flare Temperature (EU: A01 only)	Monthly measurements at each wellhead. Monthly pressure measurements of gas collection header at each individual well. Monthly, Quarterly, and annual records showing landfill gas flow rate. Quarterly testing for Btu content of landfill gas. Quarterly (500 ppm) Quarterly visible emission from the flare employing Method 22. Annual chemical analysis on the landfill gas for CH_4. Records showing collateral emission and destruction efficiency of combustion flare Recordkeeping is required for compliance demonstration.
A02	Landfill Fugitive Emissions	VOC CH_4 NMOC HAPs H_2S	AQR Sections 12, 40 CFR § 60.18, 40 CFR § 62 Subpart OOO and 40 CFR § 63 Subpart AAAA	Monitor the landfill cover integrity. Monitor fugitive CH_4 Calculate fugitive emission from the landfill. H_2S ppm	Monthly monitoring of landfill cover. Quarterly monitoring of the fugitive CH_4 concentration in ppm. Annual calculation of fugitive emission from the landfill, based

EU	Process Description	Monitored Pollutants	Applicable Subsection Title	Requirements	Compliance Monitoring
					on quarterly surface testing and chemical analysis. Monthly data collection Recordkeeping is required for compliance demonstration.

VII. EMISSION REDUCTION CREDITS (OFFSETS)

None.

VIII. MODELING

Sunrise Municipal Solid Waste Landfill is a major source in Hydrographic Area 212 (the Las Vegas Valley). Permitted emission units include one flare and fugitive emissions. Since minor source baseline dates for NO_x (October 21, 1988) and SO_2 (June 29, 1979) have been triggered, Prevention of Significant Deterioration (PSD) increment analysis is required.

DAQ modeled the source using AERMOD to track the increment consumption. Average actual emissions (2018-2019) were used in the modeling. Stack data submitted by the applicant were supplemented with information available for similar emission units. Five years (2011 to 2015) of meteorological data from the McCarran Station were used in the model. U.S. Geological Survey National Elevation Dataset terrain data were used to calculate elevations. Table VII-1 shows the location of the maximum impact and the potential PSD increment consumed by the source at that location. The impacts are below the PSD increment limits.

Table VIII-1: PSD Increment Consumption

Pollutant	Averaging Period	Source's PSD Increment Consumption (µg/m^3)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO_2	3-hour	140.23[1]	680493	4001065
SO_2	24-hour	34.67[1]	679640	4001811
SO_2	Annual	6.62	679640	4001811
NO_X	Annual	0.20	679640	4001811

[1] Second High Concentration.

IX. PUBLIC PARTICIPATION

Under AQR 12.5.2.17, the public participation requirement is triggered for OP renewals and significant revisions.

X. ADMINISTRATIVE REQUIREMENTS

AQR 12.5 requires DAQ identify the original authority for each term or condition in the Part 70 OP. Such reference of origin or citation is denoted by [italic text in brackets] after each Part 70 OP condition.

DAQ proposes to issue the Part 70 OP conditions on the following basis:

Legal:

On December 5, 2001, in 66 FR 30097 (No. 234), the EPA fully approved the Title V Operating Permit Program submitted for the purpose of complying with the Title V requirements of the 1990 CAAA and implementing 40 CFR Part 70.

Factual:

Sunrise Landfill has supplied all the necessary information for DAQ to draft Part 70 OP conditions encompassing all applicable requirements and corresponding compliance.

Conclusion:

DAQ has determined that Sunrise Landfill will continue to determine compliance through monitoring, performance testing, quarterly reporting, and daily recordkeeping, coupled with annual certifications of compliance. DAQ proceeds with the decision that a Part 70 OP should be issued as drafted to Sunrise Landfill for a period not to exceed five years.

XI. ACID RAIN REQUIREMENTS

This source is not subject to the acid rain requirements.

Attachments

GHG Calculations

Sunrise Municipal Solid Waste Landfill

Note that the GHG calculations below don't include the fugitive methane from the landfill.

General Information

Existing Flare (EU: A01):

Source	Unit Rated Throughput (scfm)	Annual Potential Throughput (mmscf)	Annual Potential Methane Generation (mmscf)	Annual Potential CO_2 Generation (mmscf)
Collection System	1,908	1,002.84	501.42	501.42
Totals	**1,908**	**1,002.84**	**501.42**	**501.42**

Potential Emissions

Source	Heat Rate (MMBtu/hr)	Total CO_2 (metric tons)	Total CO_2 (short tons)	N_2O metric tons CO_2 eq.)	N_2O (short tons CO_2 eq.)	CH_4 (metric tons CO_2 eq.)	CH_4 (short tons CO_2 eq.)	**Total Potential Emissions CO_2 eq. metric tons (CO_2+CO_2 eq.)**	**Total Potential Emissions CO_2 eq. short tons (U.S tons)**
A01 - Flare	57.240	52,491.24	57,861.10	94.14	103.7	40.11	44.22	52,625.49	58,009.08
Totals	**57.927**	**52,804.55**	**58,206.46**	**99.10**	**109.2**	**34.10**	**37.59**	**52,937.75**	**58,353.29**

New Flare (EU: A03):

Combustion Source	Unit Rated Throughput (scfm)	Annual Potential Throughput (mmscf)	Annual Potential Methane Generation (mmscf)	Annual Potential CO2 Generation (mmscf)
Collection System	1,000	525.60	262.80	262.80
Totals	**1,000**	**525.60**	**262.80**	**262.80**

Potential Emissions

Source	Heat Rate (MMBtu/hr)	Total CO_2 (metric tons)	Total CO_2 (short tons)	N_2O metric tons CO_2 eq.)	N_2O (short tons CO_2 eq.)	CH_4 (metric tons CO_2 eq.)	CH_4 (short tons CO_2 eq.)	**Total Potential Emissions CO_2 eq. metric tons (CO_2+CO_2 eq.)**	**Total Potential Emissions CO_2 eq. short tons (U.S tons)**
A01 - Flare	27.3	26,279.57	28,967.97	44.90	49.49	19.13	21.09	26,343.60	29,038.55
Totals	**30.36**	**27,675.34**	**30,506.53**	**51.94**	**57.25**	**17.87**	**19.70**	**27,745.15**	**30,583.48**

Title 40: Protection of Environment
PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES (CONTINUED)

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

Contents

SOURCE: 85 FR 17261, Mar. 26, 2020, unless otherwise noted.

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WHAT THIS SUBPART COVERS

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§63.1930 What is the purpose of this subpart?

This subpart establishes national emission standards for hazardous air pollutants for existing and new municipal solid waste (MSW) landfills.

(a) Before September 28, 2021, all landfills described in §63.1935 must meet the requirements of 40 CFR part 60, subpart WWW, or an approved state or federal plan that implements 40 CFR part 60, subpart Cc, and requires timely control of bioreactors and additional reporting requirements. Landfills must also meet the startup, shutdown, and malfunction (SSM) requirements of the general provisions as specified in Table 1 to subpart AAAA of this part and must demonstrate compliance with the operating conditions by parameter monitoring results that are within the specified ranges. Specifically, landfills must meet the following requirements of this subpart that apply before September 28, 2021, as set out in: §§63.1955(a), 63.1955(b), 63.1965(a), 63.1965(c), 63.1975, 63.1981(a), 63.1981(b), and 63.1982, and the definitions of "Controlled landfill" and "Deviation" in §63.1990.

(b) Beginning no later than September 27, 2021, all landfills described in §63.1935 must meet the requirements of this subpart. A landfill may choose to meet the requirements of this subpart rather than the requirements identified in §63.1930(a) at any time before September 27, 2021. The requirements of this subpart apply at all times, including during periods of SSM, and the SSM requirements of the General Provisions of this part do not apply.

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§63.1935 Am I subject to this subpart?

You are subject to this subpart if you meet the criteria in paragraph (a) or (b) of this section.

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

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

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

(3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to §63.1959.

(b) You are subject to this subpart if you own or operate an MSW landfill that has accepted waste since November 8, 1987, or has additional capacity for waste deposition, that includes a bioreactor, as defined in §63.1990, and that meets any one of the criteria in paragraphs (b)(1) through (3) of this section:

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

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

(3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3 and that is not permanently closed as of January 16, 2003.

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§63.1940 What is the affected source of this subpart?

(a) An affected source of this subpart is an MSW landfill, as defined in §63.1990, that meets the criteria in §63.1935(a) or (b). The affected source includes the entire disposal facility in a contiguous geographic space where household waste is placed in or on land, including any portion of the MSW landfill operated as a bioreactor.

(b) A new affected source of this subpart is an affected source that commenced construction or reconstruction after November 7, 2000. An affected source is reconstructed if it meets the definition of reconstruction in §63.2 of subpart A.

(c) An affected source of this subpart is existing if it is not new.

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§63.1945 When do I have to comply with this subpart?

(a) If your landfill is a new affected source, you must comply with this subpart by January 16, 2003, or at the time you begin operating, whichever is later.

(b) If your landfill is an existing affected source, you must comply with this subpart by January 16, 2004.

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§63.1947 When do I have to comply with this subpart if I own or operate a bioreactor?

You must comply with this subpart by the dates specified in §63.1945(a) or (b). If you own or operate a bioreactor located at a landfill that is not permanently closed as of January 16, 2003, and has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3, then you must install and operate a collection and control system that meets the criteria in §63.1959(b)(2) according to the schedule specified in paragraph (a), (b), or (c) of this section.

(a) If your bioreactor is at a new affected source, then you must meet the requirements in paragraphs (a)(1) and (2) of this section:

(1) Install the gas collection and control system for the bioreactor before initiating liquids addition.

(2) Begin operating the gas collection and control system within 180 days after initiating liquids addition or within 180 days after achieving a moisture content of 40 percent by weight, whichever is later. If you choose to begin gas collection and control system operation 180 days after achieving a 40-percent moisture content instead of 180 days after liquids addition, use the procedures in §§63.1982(c) and (d) to determine when the bioreactor moisture content reaches 40 percent.

(b) If your bioreactor is at an existing affected source, then you must install and begin operating the gas collection and control system for the bioreactor by January 17, 2006, or by the date your bioreactor is required

to install a gas collection and control system under 40 CFR part 60, subpart WWW; a federal plan; or an EPA-approved and effective state plan or tribal plan that applies to your landfill, whichever is earlier.

(c) If your bioreactor is at an existing affected source and you do not initiate liquids addition to your bioreactor until later than January 17, 2006, then you must meet the requirements in paragraphs (c)(1) and (2) of this section:

(1) Install the gas collection and control system for the bioreactor before initiating liquids addition.

(2) Begin operating the gas collection and control system within 180 days after initiating liquids addition or within 180 days after achieving a moisture content of 40 percent by weight, whichever is later. If you choose to begin gas collection and control system operation 180 days after achieving a 40-percent moisture content instead of 180 days after liquids addition, use the procedures in §§63.1982(c) and (d) to determine when the bioreactor moisture content reaches 40 percent.

[85 FR 17261, Mar. 26, 2020, as amended at 85 FR 64400, Oct. 13, 2020]

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§63.1950 When am I no longer required to comply with this subpart?

You are no longer required to comply with the requirements of this subpart when your landfill meets the collection and control system removal criteria in §63.1957(b).

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§63.1952 When am I no longer required to comply with the requirements of this subpart if I own or operate a bioreactor?

If you own or operate a landfill that includes a bioreactor, you are no longer required to comply with the requirements of this subpart for the bioreactor provided you meet the conditions of either paragraph (a) or (b) of this section.

(a) Your affected source meets the control system removal criteria in §63.1950 or the bioreactor meets the criteria for a nonproductive area of the landfill in §63.1962(a)(3)(ii).

(b) The bioreactor portion of the landfill is a closed landfill as defined in §63.1990, you have permanently ceased adding liquids to the bioreactor, and you have not added liquids to the bioreactor for at least 1 year. A closure report for the bioreactor must be submitted to the Administrator as provided in §63.1981(g).

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STANDARDS

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§63.1955 What requirements must I meet?

(a) Before September 28, 2021, if alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping, or reporting provisions have already been approved under 40 CFR part 60, subpart WWW; subpart XXX; a federal plan; or an EPA-approved and effective state or tribal plan, these alternatives can be used to comply with this subpart, except that all affected sources must comply with the SSM requirements in subpart A of this part as specified in Table 1 of this subpart and all affected sources must submit compliance reports every 6 months as specified in §63.1981(h), including information on all deviations that occurred during the 6-month reporting period. Deviations for continuous emission monitors or numerical continuous parameter monitors must be determined using a 3-hour monitoring block average. Beginning no later than September 28, 2021, the collection and control system design plan may include for approval collection and control systems that include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping, or reporting provisions, as provided in §63.1981(d)(2).

(b) If you own or operate a bioreactor that is located at an MSW landfill that is not permanently closed and has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3, then you must meet the requirements of this subpart, including requirements in paragraphs (b)(1) and (2) of this section.

(1) You must comply with this subpart starting on the date you are required to install the gas collection and control system.

(2) You must extend the collection and control system into each new cell or area of the bioreactor prior to initiating liquids addition in that area.

(c) At all times, beginning no later than September 27, 2021, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require the owner or operator to make any further efforts to reduce emissions if the requirements of this subpart have been achieved. Determination of whether a source is operating in compliance with operation and maintenance requirements will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

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§63.1957 Requirements for gas collection and control system installation and removal.

(a) *Operation.* Operate the collection and control device in accordance with the provisions of §§63.1958, 63.1960, and 63.1961.

(b) *Removal criteria.* The collection and control system may be capped, removed, or decommissioned if the following criteria are met:

(1) The landfill is a closed landfill (as defined in §63.1990). A closure report must be submitted to the Administrator as provided in §63.1981(f);

(2) The gas collection and control system has been in operation a minimum of 15 years or the landfill owner or operator demonstrates that the gas collection and control system will be unable to operate for 15 years due to declining gas flow; and

(3) Following the procedures specified in §63.1959(c), the calculated NMOC emission rate at the landfill is less than 50 Mg/yr on three successive test dates. The test dates must be no less than 90 days apart, and no more than 180 days apart.

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§63.1958 Operational standards for collection and control systems.

Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of §63.1957 must:

(a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:

(1) 5 years or more if active; or

(2) 2 years or more if closed or at final grade;

(b) Operate the collection system with negative pressure at each wellhead except under the following conditions:

(1) A fire or increased well temperature. The owner or operator must record instances when positive pressure occurs in efforts to avoid a fire. These records must be submitted with the semi-annual reports as provided in §63.1981(h);

(2) Use of a geomembrane or synthetic cover. The owner or operator must develop acceptable pressure limits in the design plan;

(3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes must be approved by the Administrator as specified in §63.1981(d)(2);

(c) Operate each interior wellhead in the collection system as specified in 40 CFR 60.753(c), until the landfill owner or operator elects to meet the operational standard for temperature in paragraph (c)(1) of this section.

(1) Beginning no later than September 27, 2021, operate each interior wellhead in the collection system with a landfill gas temperature less than 62.8 degrees Celsius (145 degrees Fahrenheit).

(2) The owner or operator may establish a higher operating temperature value at a particular well. A higher operating value demonstration must be submitted to the Administrator for approval and must include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens. The demonstration must satisfy both criteria in order to be approved (*i.e.*, neither causing fires nor killing methanogens is acceptable).

(d)(1) Operate the collection system so that the methane concentration is less than 500 parts per million (ppm) above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator must conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at no more than 30-meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring

design plan must be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

(2) Beginning no later than September 27, 2021, the owner or operator must:

(i) Conduct surface testing using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in §63.1960(d).

(ii) Conduct surface testing at all cover penetrations. Thus, the owner or operator must monitor any cover penetrations that are within an area of the landfill where waste has been placed and a gas collection system is required.

(iii) Determine the latitude and longitude coordinates of each exceedance using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.

(e) Operate the system as specified in §60.753(e) of this chapter, except:

(1) Beginning no later than September 27, 2021, operate the system in accordance to §63.1955(c) such that all collected gases are vented to a control system designed and operated in compliance with §63.1959(b)(2)(iii). In the event the collection or control system is not operating:

(i) The gas mover system must be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere must be closed within 1 hour of the collection or control system not operating; and

(ii) Efforts to repair the collection or control system must be initiated and completed in a manner such that downtime is kept to a minimum, and the collection and control system must be returned to operation.

(2) [Reserved]

(f) Operate the control system at all times when the collected gas is routed to the system.

(g) If monitoring demonstrates that the operational requirements in paragraph (b), (c), or (d) of this section are not met, corrective action must be taken as specified in §63.1960(a)(3) and (5) or (c). If corrective actions are taken as specified in §63.1960, the monitored exceedance is not a deviation of the operational requirements in this section.

[85 FR 17261, Mar. 26, 2020, as amended at 85 FR 64400, Oct. 13, 2020]

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§63.1959 NMOC calculation procedures.

(a) Calculate the NMOC emission rate using the procedures specified in §60.754(a) of this chapter, except:

(1) *NMOC emission rate.* Beginning no later than September 27, 2021 the landfill owner or operator must calculate the NMOC emission rate using either Equation 1 provided in paragraph (a)(1)(i) of this section or Equation 2 provided in paragraph (a)(1)(ii) of this section. Both Equation 1 and Equation 2 may be used if the actual year-to-year solid waste acceptance rate is known, as specified in paragraph (a)(1)(i) of this section,

for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown, as specified in paragraph (a)(1)(ii) of this section, for part of the life of the landfill. The values to be used in both Equation 1 and Equation 2 are 0.05 per year for k, 170 cubic meters per megagram (m^3/Mg) for L_O, and 4,000 parts per million by volume (ppmv) as hexane for the C_{NMOC}. For landfills located in geographical areas with a 30-year annual average precipitation of less than 25 inches, as measured at the nearest representative official meteorologic site, the k value to be used is 0.02 per year.

(i)(A) Equation 1 must be used if the actual year-to-year solid waste acceptance rate is known.

$$M_{NMOC} = \sum_{i=1}^{n} 2\,k\,L_o M_i \left(e^{-kt_i}\right) (C_{NMOC}) (3.6x10^{-9}) \text{ (Eq. 1)}$$

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Where:

M_{NMOC} = Total NMOC emission rate from the landfill, Mg/yr.

k = Methane generation rate constant, year−1.

L_o = Methane generation potential, m^3/Mg solid waste.

M_i = Mass of solid waste in the ith section, Mg.

t_i = Age of the ith section, years.

C_{NMOC} = Concentration of NMOC, ppmv as hexane.

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

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

(ii)(A) Equation 2 must be used if the actual year-to-year solid waste acceptance rate is unknown.

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

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Where:

M_{NMOC} = Mass emission rate of NMOC, Mg/yr.

L_o = Methane generation potential, m^3/Mg solid waste.

R = Average annual acceptance rate, Mg/yr.

k = Methane generation rate constant, $year^{-1}$.

t = Age of landfill, years.

C_{NMOC} = Concentration of NMOC, ppmv as hexane.

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

3.6×10^{-9} = Conversion factor.

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

(2) *Tier 1.* The owner or operator must compare the calculated NMOC mass emission rate to the standard of 50 Mg/yr.

(i) If the NMOC emission rate calculated in paragraph (a)(1) of this section is less than 50 Mg/yr, then the landfill owner or operator must submit an NMOC emission rate report according to §63.1981(c) and must recalculate the NMOC mass emission rate annually as required under paragraph (b) of this section.

(ii) If the calculated NMOC emission rate as calculated in paragraph (a)(1) of this section is equal to or greater than 50 Mg/yr, then the landfill owner must either:

(A) Submit a gas collection and control system design plan within 1 year as specified in §63.1981(d) and install and operate a gas collection and control system within 30 months of the first annual report in which the NMOC emission rate equals or exceeds 50 Mg/yr, according to paragraphs (b)(2)(ii) and (iii) of this section;

(B) Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the Tier 2 procedures provided in paragraph (a)(3) of this section; or

(C) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the Tier 3 procedures provided in paragraph (a)(4) of this section.

(3) *Tier 2.* The landfill owner or operator must determine the site-specific NMOC concentration using the following sampling procedure. The landfill owner or operator must install at least two sample probes per hectare, evenly distributed over the landfill surface that has retained waste for at least 2 years. If the landfill is larger than 25 hectares in area, only 50 samples are required. The probes should be evenly distributed across the sample area. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator must collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using EPA Method 25 or 25C of appendix A-7 to part 60. Taking composite samples from different probes into a single cylinder is allowed; however, equal sample volumes must be taken from each probe. For each composite, the sampling rate, collection times, beginning and ending cylinder vacuums, or alternative volume measurements must be recorded to verify that composite volumes are equal. Composite sample volumes should not be less than one liter unless evidence can be provided to substantiate the accuracy of smaller volumes. Terminate compositing before the cylinder approaches ambient pressure where measurement accuracy diminishes. If more than the required number of samples are taken, all samples must be used in the analysis. The landfill owner or operator must divide the NMOC concentration from EPA Method 25 or 25C of appendix A-7 to part 60 by 6 to convert from C_{NMOC} as carbon to C_{NMOC} as hexane. If the landfill has an active or passive gas removal system in place, EPA Method 25 or 25C samples may be collected from these systems instead of surface probes provided the removal system can be shown to provide sampling as representative as the two sampling probe per hectare requirement. For active collection systems, samples may be collected from the common header pipe. The sample location on the common header pipe must be before any gas moving, condensate removal, or treatment system equipment. For active collection systems, a minimum of three samples must be collected from the header pipe.

(i) Within 60 days after the date of completing each performance test (as defined in §63.7 of subpart A), the owner or operator must submit the results according to §63.1981(l)(1).

(ii) The landfill owner or operator must recalculate the NMOC mass emission rate using Equation 1 or Equation 2 provided in paragraph (a)(1)(i) or (ii) of this section and use the average site-specific NMOC

concentration from the collected samples instead of the default value provided in paragraph (a)(1) of this section.

(iii) If the resulting NMOC mass emission rate is less than 50 Mg/yr, then the owner or operator must submit a periodic estimate of NMOC emissions in an NMOC emission rate report according to §63.1981(c) and must recalculate the NMOC mass emission rate annually as required under paragraph (b) of this section. The site-specific NMOC concentration must be retested every 5 years using the methods specified in this section.

(iv) If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration is equal to or greater than 50 Mg/yr, the landfill owner or operator must either:

(A) Submit a gas collection and control system design plan within 1 year as specified in §63.1981(d) and install and operate a gas collection and control system within 30 months according to paragraphs (b)(2)(ii) and (iii) of this section; or

(B) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the Tier 3 procedures specified in paragraph (a)(4) of this section.

(4) *Tier 3.* The site-specific methane generation rate constant must be determined using the procedures provided in EPA Method 2E of appendix A-1 to part 60 of this chapter. The landfill owner or operator must estimate the NMOC mass emission rate using Equation 1 or Equation 2 in paragraph (a)(1)(i) or (ii) of this section and using a site-specific methane generation rate constant, and the site-specific NMOC concentration as determined in paragraph (a)(3) of this section instead of the default values provided in paragraph (a)(1) of this section. The landfill owner or operator must compare the resulting NMOC mass emission rate to the standard of 50 Mg/yr.

(i) If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration and Tier 3 site-specific methane generation rate is equal to or greater than 50 Mg/yr, the owner or operator must:

(A) Submit a gas collection and control system design plan within 1 year as specified in §63.1981(d) and install and operate a gas collection and control system within 30 months of the first annual report in which the NMOC emission rate equals or exceeds 50 Mg/yr, according to paragraphs (b)(2)(ii) and (iii) of this section.

(B) [Reserved]

(ii) If the NMOC mass emission rate is less than 50 Mg/yr, then the owner or operator must recalculate the NMOC mass emission rate annually using Equation 1 or Equation 2 in paragraph (a)(1) of this section and using the site-specific Tier 2 NMOC concentration and Tier 3 methane generation rate constant and submit a periodic NMOC emission rate report as provided in §63.1981(c). The calculation of the methane generation rate constant is performed only once, and the value obtained from this test must be used in all subsequent annual NMOC emission rate calculations.

(5) *Other methods.* The owner or operator may use other methods to determine the NMOC concentration or a site-specific methane generation rate constant as an alternative to the methods required in paragraphs (a)(3) and (4) of this section if the method has been approved by the Administrator.

(b) Each owner or operator of an affected source having a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3 must either comply with paragraph (b)(2) of this section or calculate an NMOC

emission rate for the landfill using the procedures specified in paragraph (a) of this section. The NMOC emission rate must be recalculated annually, except as provided in §63.1981(c)(1)(ii)(A).

(1) If the calculated NMOC emission rate is less than 50 Mg/yr, the owner or operator must:

(i) Submit an annual NMOC emission rate emission report to the Administrator, except as provided for in §63.1981(c)(1)(ii); and

(ii) Recalculate the NMOC emission rate annually using the procedures specified in paragraph (a)(1) of this section until such time as the calculated NMOC emission rate is equal to or greater than 50 Mg/yr, or the landfill is closed.

(A) If the calculated NMOC emission rate, upon initial calculation or annual recalculation required in paragraph (b) of this section, is equal to or greater than 50 Mg/yr, the owner or operator must either: comply with paragraph (b)(2) of this section or calculate NMOC emissions using the next higher tier in paragraph (a) of this section.

(B) If the landfill is permanently closed, a closure report must be submitted to the Administrator as provided for in §63.1981(f).

(2) If the calculated NMOC emission rate is equal to or greater than 50 Mg/yr using Tier 1, 2, or 3 procedures, the owner or operator must either:

(i) Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year as specified in §63.1981(d) or calculate NMOC emissions using the next higher tier in paragraph (a) of this section. The collection and control system must meet the requirements in paragraphs (b)(2)(ii) and (iii) of this section.

(ii) Collection system. Install and start up a collection and control system that captures the gas generated within the landfill as required by paragraphs (b)(2)(ii)(B) or (C) and (b)(2)(iii) of this section within 30 months after:

(A) The first annual report in which the NMOC emission rate equals or exceeds 50 Mg/yr, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 50 Mg.

(B) An active collection system must:

(*1*) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment;

(*2*) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade;

(*3*) Collect gas at a sufficient extraction rate; and

(*4*) Be designed to minimize off-site migration of subsurface gas.

(C) A passive collection system must:

(*1*) Comply with the provisions specified in paragraphs (b)(2)(ii)(B)(1), (2), and (3) of this section; and

(*2*) Be installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners must be installed as required under §258.40 of this chapter.

(iii) Control system. Route all the collected gas to a control system that complies with the requirements in either paragraph (b)(2)(iii)(A), (B), or (C) of this section.

(A) A non-enclosed flare designed and operated in accordance with the parameters established in §63.11(b) except as noted in paragraph (e) of this section; or

(B) A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight-percent or reduce the outlet NMOC concentration to less than 20 ppmv, dry basis as hexane at 3-percent oxygen. The reduction efficiency or ppmv must be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in paragraph (e) of this section. The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts that burn landfill gas for compliance with this subpart.

(*1*) If a boiler or process heater is used as the control device, the landfill gas stream must be introduced into the flame zone.

(*2*) The control device must be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in §§63.1961(b) through (e);

(C) A treatment system that processes the collected gas for subsequent sale or beneficial use such as fuel for combustion, production of vehicle fuel, production of high-British thermal unit (Btu) gas for pipeline injection, or use as a raw material in a chemical manufacturing process. Venting of treated landfill gas to the ambient air is not allowed. If the treated landfill gas cannot be routed for subsequent sale or beneficial use, then the treated landfill gas must be controlled according to either paragraph (b)(2)(iii)(A) or (B) of this section.

(D) All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of paragraph (b)(2)(iii)(A) or (B) of this section. For purposes of this subpart, atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of paragraph (b)(2)(iii)(A) or (B) of this section.

(c) After the installation and startup of a collection and control system in compliance with this subpart, the owner or operator must calculate the NMOC emission rate for purposes of determining when the system can be capped, removed, or decommissioned as provided in §63.1957(b)(3), using Equation 3:

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

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Where:

M_{NMOC} = Mass emission rate of NMOC, Mg/yr.

Q_{LFG} = Flow rate of landfill gas, m^3 per minute.

C_{NMOC} = Average NMOC concentration, ppmv as hexane.

1.89×10^{-3} = Conversion factor.

(1) The flow rate of landfill gas, Q_{LFG}, must be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control system using a gas flow measuring device calibrated according to the provisions of section 10 of EPA Method 2E of appendix A-1 of part 60.

(2) The average NMOC concentration, C_{NMOC}, must be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in EPA Method 25 or 25C of appendix A-7 to part 60 of this chapter. The sample location on the common header pipe must be before any condensate removal or other gas refining units. The landfill owner or operator must divide the NMOC concentration from EPA Method 25 or 25C of appendix A-7 to part 60 by 6 to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.

(3) The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the Administrator.

(i) Within 60 days after the date of completing each performance test (as defined in §63.7), the owner or operator must submit the results of the performance test, including any associated fuel analyses, according to §63.1981(l)(1).

(ii) [Reserved]

(d) For the performance test required in §63.1959(b)(2)(iii)(B), EPA Method 25 or 25C (EPA Method 25C of appendix A-7 to part 60 of this chapter may be used at the inlet only) of appendix A of this part must be used to determine compliance with the 98 weight-percent efficiency or the 20- ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by §63.1981(d)(2). EPA Method 3, 3A, or 3C of appendix A-7 to part 60 must be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), EPA Method 25A should be used in place of EPA Method 25. EPA Method 18 may be used in conjunction with EPA Method 25A on a limited basis (compound specific, *e.g.*, methane) or EPA Method 3C may be used to determine methane. The methane as carbon should be subtracted from the EPA Method 25A total hydrocarbon value as carbon to give NMOC concentration as carbon. The landowner or operator must divide the NMOC concentration as carbon by 6 to convert from the C_{NMOC} as carbon to C_{NMOC} as hexane. Equation 4 must be used to calculate efficiency:

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

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Where:

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

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

(e) For the performance test required in §63.1959(b)(2)(iii)(A), the net heating value of the combusted landfill gas as determined in §63.11(b)(6)(ii) is calculated from the concentration of methane in the landfill gas as measured by EPA Method 3C of appendix A to part 60 of this chapter. A minimum of three 30-minute EPA Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. EPA Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under §63.11(b)(7) of subpart A.

(1) Within 60 days after the date of completing each performance test (as defined in §63.7), the owner or operator must submit the results of the performance tests, including any associated fuel analyses, required by §63.1959(c) or (e) according to §63.1981(l)(1).

(2) [Reserved]

(f) The performance tests required in §§63.1959(b)(2)(iii)(A) and (B), must be conducted under such conditions as the Administrator specifies to the owner or operator based on representative performance of the affected source for the period being tested. Representative conditions exclude periods of startup and shutdown unless specified by the Administrator. The owner or operator may not conduct performance tests during periods of malfunction. The owner or operator must record the process information that is necessary to document operating conditions during the test and include in such record an explanation to support that such conditions represent normal operation. Upon request, the owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of performance tests.

[85 FR 17261, Mar. 26, 2020, as amended at 85 FR 64400, Oct. 13, 2020]

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§63.1960 Compliance provisions.

(a) Except as provided in §63.1981(d)(2), the specified methods in paragraphs (a)(1) through (5) of this section must be used to determine whether the gas collection system is in compliance with §63.1959(b)(2)(ii).

(1) For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with §63.1959(b)(2)(ii)(C)(1), either Equation 5 or Equation 6 must be used. The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the Administrator. The methane generation rate constant (k) and methane generation potential (L_o) kinetic factors should be those published in the most recent *Compilation of Air Pollutant Emission Factors* (AP-42) or other site-specific values demonstrated to be appropriate and approved by the Administrator. If k has been determined as specified in §63.1959(a)(4), the value of k determined from the test must be used. A value of no more than 15 years must be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.

(i) For sites with unknown year-to-year solid waste acceptance rate:

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

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Where:

Qm = Maximum expected gas generation flow rate, m^3/yr.

L_o = Methane generation potential, m^3/Mg solid waste.

R = Average annual acceptance rate, Mg/yr.

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).

2 = Constant.

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

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

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Where:

Qm = Maximum expected gas generation flow rate, m^3/yr.

k = Methane generation rate constant, $year^{-1}$.

L_o = Methane generation potential, m^3/Mg solid waste.

M_i = Mass of solid waste in the ith section, Mg.

t_i = Age of the ith section, years.

(iii) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, Equation 5 or Equation 6 in paragraphs (a)(1)(i) and (ii) of this section. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using Equation 5 or Equation 6 in paragraph (a)(1)(i) or (ii) of this section or other methods must be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

(2) For the purposes of determining sufficient density of gas collectors for compliance with §63.1959(b)(2)(ii)(B)(*2*), the owner or operator must design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the Administrator, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.

(3) For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with §63.1959(b)(2)(ii)(B)(*3*), the owner or operator must measure gauge pressure in the gas collection header applied to each individual well monthly. Any attempted corrective measure must not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval. If a positive pressure exists, follow the procedures as specified in §60.755(a)(3), except:

(i) Beginning no later than September 27, 2021, if a positive pressure exists, action must be initiated to correct the exceedance within 5 days, except for the three conditions allowed under §63.1958(b).

(A) If negative pressure cannot be achieved without excess air infiltration within 15 days of the first measurement of positive pressure, the owner or operator must conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after positive pressure was first measured. The owner or operator must keep records according to §63.1983(e)(3).

(B) If corrective actions cannot be fully implemented within 60 days following the positive pressure measurement for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the positive pressure measurement. The owner or operator must submit the items listed in §63.1981(h)(7) as part of the next semi-annual report. The owner or operator must keep records according to §63.1983(e)(4).

(C) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to §63.1981(j). The owner or operator must keep records according to §63.1983(e)(5).

(ii) [Reserved]

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the temperature and nitrogen or oxygen operational standards in introductory paragraph §63.1958(c), for the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator must follow the procedures as specified in §60.755(a)(5) of this chapter, except:

(i) Once an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in §63.1958(c)(1), the owner or operator must monitor each well monthly for temperature. If a well exceeds the operating parameter for temperature as provided in §63.1958(c)(1), action must be initiated to correct the exceedance within 5 days. Any attempted corrective measure must not cause exceedances of other operational or performance standards.

(A) If a landfill gas temperature less than or equal to 62.8 degrees Celsius (145 degrees Fahrenheit) cannot be achieved within 15 days of the first measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit), the owner or operator must conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after a landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit) was first measured. The owner or operator must keep records according to §63.1983(e)(3).

(B) If corrective actions cannot be fully implemented within 60 days following the temperature measurement for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit). The owner or operator must submit the items listed in §63.1981(h)(7) as part of the next semi-annual report. The owner or operator must keep records according to §63.1983(e)(4).

(C) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to §63.1981(h)(7) and (j). The owner or operator must keep records according to §63.1983(e)(5).

(D) If a landfill gas temperature measured at either the wellhead or at any point in the well is greater than or equal to 76.7 degrees Celsius (170 degrees Fahrenheit) and the carbon monoxide concentration measured, according to the procedures in §63.1961(a)(5)(vi) is greater than or equal to 1,000 ppmv the corrective action(s) for the wellhead temperature standard (62.8 degrees Celsius or 145 degrees Fahrenheit) must be completed within 15 days.

(5) An owner or operator seeking to demonstrate compliance with §63.1959(b)(2)(ii)(B)(*4*) through the use of a collection system not conforming to the specifications provided in §63.1962 must provide information satisfactory to the Administrator as specified in §63.1981(d)(3) demonstrating that off-site migration is being controlled.

(b) For purposes of compliance with §63.1958(a), each owner or operator of a controlled landfill must place each well or design component as specified in the approved design plan as provided in §63.1981(d).

Each well must be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:

(1) 5 years or more if active; or

(2) 2 years or more if closed or at final grade.

(c) The following procedures must be used for compliance with the surface methane operational standard as provided in §63.1958(d).

(1) After installation and startup of the gas collection system, the owner or operator must monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of this section.

(2) The background concentration must be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.

(3) Surface emission monitoring must be performed in accordance with section 8.3.1 of EPA Method 21 of appendix A-7 of part 60 of this chapter, except that the probe inlet must be placed within 5 to 10 centimeters of the ground. Monitoring must be performed during typical meteorological conditions.

(4) Any reading of 500 ppm or more above background at any location must be recorded as a monitored exceedance and the actions specified in paragraphs (c)(4)(i) through (v) of this section must be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of §63.1958(d).

(i) The location of each monitored exceedance must be marked and the location and concentration recorded. Beginning no later than September 27, 2021, the location must be recorded using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.

(ii) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance must be made and the location must be re-monitored within 10 days of detecting the exceedance.

(iii) If the re-monitoring of the location shows a second exceedance, additional corrective action must be taken and the location must be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in paragraph (c)(4)(v) of this section must be taken, and no further monitoring of that location is required until the action specified in paragraph (c)(4)(v) of this section has been taken.

(iv) Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring specified in paragraph (c)(4)(ii) or (iii) of this section must be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 ppm above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in paragraph (c)(4)(iii) or (v) of this section must be taken.

(v) For any location where monitored methane concentration equals or exceeds 500 ppm above background three times within a quarterly period, a new well or other collection device must be installed

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

(5) The owner or operator must implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

(d) Each owner or operator seeking to comply with the provisions in paragraph (c) of this section must comply with the following instrumentation specifications and procedures for surface emission monitoring devices:

(1) The portable analyzer must meet the instrument specifications provided in section 6 of EPA Method 21 of appendix A of part 60 of this chapter, except that "methane" replaces all references to "VOC".

(2) The calibration gas must be methane, diluted to a nominal concentration of 500 ppm in air.

(3) To meet the performance evaluation requirements in section 8.1 of EPA Method 21 of appendix A of part 60 of this chapter, the instrument evaluation procedures of section 8.1 of EPA Method 21 of appendix A of part 60 must be used.

(4) The calibration procedures provided in sections 8 and 10 of EPA Method 21 of appendix A of part 60 of this chapter must be followed immediately before commencing a surface monitoring survey.

(e)(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standards in introductory paragraph §63.1958(e), the provisions of this subpart apply at all times, except during periods of SSM, provided that the duration of SSM does not exceed 5 days for collection systems and does not exceed 1 hour for treatment or control devices. You must comply with the provisions in Table 1 to subpart AAAA that apply before September 28, 2021.

(2) Once an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard in §63.1958(e)(1), the provisions of this subpart apply at all times, including periods of SSM. During periods of SSM, you must comply with the work practice requirement specified in §63.1958(e) in lieu of the compliance provisions in §63.1960.

[85 FR 17261, Mar. 26, 2020, as amended at 85 FR 64400, Oct. 13, 2020]

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§63.1961 Monitoring of operations.

Except as provided in §63.1981(d)(2):

(a) Each owner or operator seeking to comply with §63.1959(b)(2)(ii)(B) for an active gas collection system must install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:

(1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in §63.1960(a)(3); and

(2) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as follows:

(i) The nitrogen level must be determined using EPA Method 3C of appendix A-2 to part 60 of this chapter, unless an alternative test method is established as allowed by §63.1981(d)(2).

(ii) Unless an alternative test method is established as allowed by §63.1981(d)(2), the oxygen level must be determined by an oxygen meter using EPA Method 3A or 3C of appendix A-2 to part 60 of this chapter or ASTM D6522-11 (incorporated by reference, see §63.14). Determine the oxygen level by an oxygen meter using EPA Method 3A or 3C of appendix A-2 to part 60 or ASTM D6522-11 (if sample location is prior to combustion) except that:

(A) The span must be set between 10- and 12-percent oxygen;

(B) A data recorder is not required;

(C) Only two calibration gases are required, a zero and span;

(D) A calibration error check is not required; and

(E) The allowable sample bias, zero drift, and calibration drift are ±10 percent.

(iii) A portable gas composition analyzer may be used to monitor the oxygen levels provided:

(A) The analyzer is calibrated; and

(B) The analyzer meets all quality assurance and quality control requirements for EPA Method 3A of appendix A-2 to part 60 of this chapter or ASTM D6522-11 (incorporated by reference, see §63.14).

(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the temperature and nitrogen or oxygen operational standards in introductory paragraph §63.1958(c), the owner or operator must follow the procedures as specified in §60.756(a)(2) and (3) of this chapter. Monitor temperature of the landfill gas on a monthly basis as provided in §63.1960(a)(4). The temperature measuring device must be calibrated annually using the procedure in Section 10.3 of EPA Method 2 of appendix A-1 to part 60 of this chapter.

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in §63.1958(c)(1), monitor temperature of the landfill gas on a monthly basis as provided in §63.1960(a)(4). The temperature measuring device must be calibrated annually using the procedure in Section 10.3 of EPA Method 2 of appendix A-1 to part 60 of this chapter. Keep records specified in §63.1983(e).

(5) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in §63.1958(c)(1), unless a higher operating temperature value has been approved by the Administrator under this subpart or under 40 CFR part 60, subpart WWW; 40 CFR part 60, subpart XXX; or a federal plan or EPA-approved and effective state plan or tribal plan that implements either 40 CFR part 60, subpart Cc or 40 CFR part 60, subpart Cf, you must initiate enhanced monitoring at each well with a measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit) as follows:

(i) Visual observations for subsurface oxidation events (smoke, smoldering ash, damage to well) within the radius of influence of the well.

(ii) Monitor oxygen concentration as provided in paragraph (a)(2) of this section;

(iii) Monitor temperature of the landfill gas at the wellhead as provided in paragraph (a)(4) of this section.

(iv) Monitor temperature of the landfill gas every 10 vertical feet of the well as provided in paragraph (a)(6) of this section.

(v) Monitor the methane concentration with a methane meter using EPA Method 3C of appendix A-6 to part 60, EPA Method 18 of appendix A-6 to part 60 of this chapter, or a portable gas composition analyzer to monitor the methane levels provided that the analyzer is calibrated and the analyzer meets all quality assurance and quality control requirements for EPA Method 3C or EPA Method 18.

(vi) Monitor carbon monoxide concentrations, as follows:

(A) Collect the sample from the wellhead sampling port in a passivated canister or multi-layer foil gas sampling bag (such as the Cali-5-Bond Bag) and analyze that sample using EPA Method 10 of appendix A-4 to part 60 of this chapter, or an equivalent method with a detection limit of at least 100 ppmv of carbon monoxide in high concentrations of methane; and

(B) Collect and analyze the sample from the wellhead using EPA Method 10 of appendix A-4 to part 60 to measure carbon monoxide concentrations.

(vii) The enhanced monitoring this paragraph (a)(5) must begin 7 days after the first measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit); and

(viii) The enhanced monitoring in this paragraph (a)(5) must be conducted on a weekly basis. If four consecutive weekly carbon monoxide readings are under 100 ppmv, then enhanced monitoring may be decreased to monthly. However, if carbon monoxide readings exceed 100 ppmv again, the landfill must return to weekly monitoring.

(ix) The enhanced monitoring in this paragraph (a)(5) can be stopped once a higher operating value is approved, at which time the monitoring provisions issued with the higher operating value should be followed, or once the measurement of landfill gas temperature at the wellhead is less than or equal to 62.8 degrees Celsius (145 degrees Fahrenheit).

(6) For each wellhead with a measurement of landfill gas temperature greater than or equal to 73.9 degrees Celsius (165 degrees Fahrenheit), annually monitor temperature of the landfill gas every 10 vertical feet of the well. This temperature can be monitored either with a removable thermometer, or using temporary or permanent thermocouples installed in the well.

(b) Each owner or operator seeking to comply with §63.1959(b)(2)(iii) using an enclosed combustor must calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:

(1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.

(2) A device that records flow to the control device and bypass of the control device (if applicable). The owner or operator must:

(i) Install, calibrate, and maintain a gas flow rate measuring device that must record the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(c) Each owner or operator seeking to comply with §63.1959(b)(2)(iii) using a non-enclosed flare must install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

(1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame; and

(2) A device that records flow to the flare and bypass of the flare (if applicable). The owner or operator must:

(i) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(d) Each owner or operator seeking to demonstrate compliance with §63.1959(b)(2)(iii) using a device other than a non-enclosed flare or an enclosed combustor or a treatment system must provide information satisfactory to the Administrator as provided in §63.1981(d)(2) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator must review the information and either approve it, or request that additional information be submitted. The Administrator may specify additional appropriate monitoring procedures.

(e) Each owner or operator seeking to install a collection system that does not meet the specifications in §63.1962 or seeking to monitor alternative parameters to those required by §§63.1958 through 63.1961 must provide information satisfactory to the Administrator as provided in §63.1981(d)(2) and (3) describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator may specify additional appropriate monitoring procedures.

(f) Each owner or operator seeking to demonstrate compliance with the 500-ppm surface methane operational standard in §63.1958(d) must monitor surface concentrations of methane according to the procedures in §63.1960(c) and the instrument specifications in §63.1960(d). If you are complying with the 500-ppm surface methane operational standard in §63.1958(d)(2), for location, you must determine the latitude and longitude coordinates of each exceedance using an instrument with an accuracy of at least 4 meters and the coordinates must be in decimal degrees with at least five decimal places. In the semi-annual report in §63.1981(h), you must report the location of each exceedance of the 500-ppm methane concentration as provided in §63.1958(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month. Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

(g) Each owner or operator seeking to demonstrate compliance with §63.1959(b)(2)(iii)(C) using a landfill gas treatment system must calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to the treatment system and bypass of the treatment system (if applicable). Beginning no later than September 27, 2021, each owner or operator must maintain and operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan required in §63.1983(b)(5)(ii). The owner or operator must:

(1) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and

(2) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(h) The monitoring requirements of paragraphs (a), (b), (c), (d), and (g) of this section apply at all times the affected source is operating, except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. You are required to complete monitoring system repairs in response to monitoring system malfunctions and to return the monitoring system to operation as expeditiously as practicable. Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the temperature and nitrogen or oxygen operational standards in introductory paragraph §63.1958(c)(1), (d)(2), and (e)(1), the standards apply at all times.

[85 FR 17261, Mar. 26, 2020, as amended at 85 FR 64401, Oct. 13, 2020]

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§63.1962 Specifications for active collection systems.

(a) Each owner or operator seeking to comply with §63.1959(b)(2)(i) must site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the Administrator as provided in §63.1981(d)(2) and (3):

(1) The collection devices within the interior must be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues must be addressed in the design: Depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, resistance to the refuse decomposition heat, and ability to isolate individual components or sections for repair or troubleshooting without shutting down entire collection system.

(2) The sufficient density of gas collection devices determined in paragraph (a)(1) of this section must address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.

(3) The placement of gas collection devices determined in paragraph (a)(1) of this section must control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (ii) of this section.

(i) Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under §63.1983(d). The documentation must provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area and must be provided to the Administrator upon request.

(ii) Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material must be documented and provided to the Administrator upon request. A separate NMOC emissions estimate must be made for each section proposed for exclusion, and the sum of all such sections must be compared to the NMOC emissions estimate for the entire landfill.

(A) The NMOC emissions from each section proposed for exclusion must be computed using Equation 7:

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

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Where:

Q_i = NMOC emission rate from the ith section, Mg/yr.

k = Methane generation rate constant, year $^{-1}$.

L_o = Methane generation potential, m^3/Mg solid waste.

M_i = Mass of the degradable solid waste in the ith section, Mg.

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

C_{NMOC} = Concentration of NMOC, ppmv.

3.6×10^{-9} = Conversion factor.

(B) If the owner/operator is proposing to exclude, or cease gas collection and control from, nonproductive physically separated (*e.g.*, separately lined) closed areas that already have gas collection systems, NMOC emissions from each physically separated closed area must be computed using either Equation 3 in §63.1959(c) or Equation 7 in paragraph (a)(3)(ii)(A) of this section.

(iii) The values for k and C_{NMOC} determined in field testing must be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (the distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k, L_o and C_{NMOC} provided in §63.1959(a)(1) or the alternative values from §63.1959(a)(5) must be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in paragraph (a)(3)(i) of this section.

(b) Each owner or operator seeking to comply with §63.1959(b)(2)(ii) must construct the gas collection devices using the following equipment or procedures:

(1) The landfill gas extraction components must be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of

suitable dimensions to: Convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system must extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors must be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations must be situated with regard to the need to prevent excessive air infiltration.

(2) Vertical wells must be placed so as not to endanger underlying liners and must address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors must be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices must be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.

(3) Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly must include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices must be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

(c) Each owner or operator seeking to comply with §63.1959(b)(2)(iii) must convey the landfill gas to a control system in compliance with §63.1959(b)(2)(iii) through the collection header pipe(s). The gas mover equipment must be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

(1) For existing collection systems, the flow data must be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (c)(2) of this section must be used.

(2) For new collection systems, the maximum flow rate must be in accordance with §63.1960(a)(1).

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GENERAL AND CONTINUING COMPLIANCE REQUIREMENTS

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§63.1964 How is compliance determined?

Compliance is determined using performance testing, collection system monitoring, continuous parameter monitoring, and other credible evidence. In addition, continuous parameter monitoring data collected under §63.1961(b)(1), (c)(1), and (d) are used to demonstrate compliance with the operating standards for control systems. If a deviation occurs, you have failed to meet the control device operating standards described in this subpart and have deviated from the requirements of this subpart.

(a) Before September 28, 2021, you must develop a written SSM plan according to the provisions in §63.6(e)(3) of subpart A. A copy of the SSM plan must be maintained on site. Failure to write or maintain a copy of the SSM plan is a deviation from the requirements of this subpart.

(b) After September 27, 2021, the SSM provisions of §63.6(e) of subpart A no longer apply to this subpart and the SSM plan developed under paragraph (a) of this section no longer applies. Compliance with the emissions standards and the operating standards of §63.1958 of this subpart is required at all times.

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§63.1965 What is a deviation?

A deviation is defined in §63.1990. For the purposes of the landfill monitoring and SSM plan requirements, deviations include the items in paragraphs (a) through (c) of this section.

(a) A deviation occurs when the control device operating parameter boundaries described in §63.1983(c)(1) are exceeded.

(b) A deviation occurs when 1 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.

(c) Before September 28, 2021, a deviation occurs when a SSM plan is not developed or maintained on site and when an affected source fails to meet any emission limitation, (including any operating limit), or work practice requirement in this subpart during SSM, regardless of whether or not such failure is permitted by this subpart.

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§63.1975 How do I calculate the 3-hour block average used to demonstrate compliance?

Before September 28, 2021, averages are calculated in the same way as they are calculated in 40 CFR part 60, subpart WWW (§60.758(b)(2)(i) for average combustion temperature and §60.758(c) for 3-hour average combustion temperature for enclosed combustors), except that the data collected during the events listed in paragraphs (a) through (d) of this section are not to be included in any average computed under this subpart. Beginning no later than September 27, 2021, averages are calculated according to §§63.1983(b)(2)(i) and 63.1983(c)(1)(i) and the data collected during the events listed in paragraphs (a) through (d) of this section are included in any average computed under this subpart.

(a) Monitoring system breakdowns, repairs, calibration checks, and zero (low-level) and high-level adjustments.

(b) Startups.

(c) Shutdowns.

(d) Malfunctions.

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NOTIFICATIONS, RECORDS, AND REPORTS

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§63.1981 What reports must I submit?

You must submit the reports specified in this section and the reports specified in Table 1 to this subpart. If you have previously submitted a design capacity report, amended design capacity report, initial NMOC emission rate report, initial or revised collection and control system design plan, closure report, equipment removal report, or initial performance test under 40 CFR part 60, subpart WWW; 40 CFR part 60, subpart

XXX; or a federal plan or EPA-approved and effective state plan or tribal plan that implements either 40 CFR part 60, subpart Cc or 40 CFR part 60, subpart Cf, then that submission constitutes compliance with the design capacity report in paragraph (a) of this section, the amended design capacity report in paragraph (b) of this section, the initial NMOC emission rate report in paragraph (c) of this section, the initial collection and control system design plan in paragraph (d) of this section, the revised design plan in paragraph (e) of this section, the closure report in paragraph (f) of this section, the equipment removal report in paragraph (g) of this section, and the initial performance test report in paragraph (i) of this section. You do not need to re-submit the report(s). However, you must include a statement certifying prior submission of the respective report(s) and the date of submittal in the first semi-annual report required in this section.

(a) *Initial design capacity report.* The initial design capacity report must contain the information specified in §60.757(a)(2) of this chapter, except beginning no later than September 28, 2021, the report must contain:

(1) A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the permit issued by the state, local, or tribal agency responsible for regulating the landfill.

(2) The maximum design capacity of the landfill. Where the maximum design capacity is specified in the permit issued by the state, local, or tribal agency responsible for regulating the landfill, a copy of the permit specifying the maximum design capacity may be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity must be calculated using good engineering practices. The calculations must be provided, along with the relevant parameters as part of the report. The landfill may calculate design capacity in either Mg or m^3 for comparison with the exemption values. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million Mg or 2.5 million m^3, the calculation must include a site-specific density, which must be recalculated annually. Any density conversions must be documented and submitted with the design capacity report. The state, tribal, local agency or Administrator may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.

(b) *Amended design capacity report.* An amended design capacity report must be submitted to the Administrator providing notification of an increase in the design capacity of the landfill, within 90 days of an increase in the maximum design capacity of the landfill to meet or exceed 2.5 million Mg and 2.5 million m^3. This increase in design capacity may result from an increase in the permitted volume of the landfill or an increase in the density as documented in the annual recalculation required in §63.1983(f).

(c) *NMOC emission rate report.* Each owner or operator subject to the requirements of this subpart must submit a copy of the latest NMOC emission rate report that was submitted according to §60.757(b) of this chapter or submit an NMOC emission rate report to the Administrator initially and annually thereafter, except as provided for in paragraph (c)(1)(ii)(A) of this section. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate. If you have submitted an annual report under 40 CFR part 60, subpart WWW; 40 CFR part 60, subpart XXX; or a Federal plan or EPA-approved and effective state plan or tribal plan that implements either 40 CFR part 60, subpart Cc or 40 CFR part 60, subpart Cf, then that submission constitutes compliance with the annual NMOC emission rate report in this paragraph. You do not need to re-submit the annual report for the current year. Beginning no later than September 27, 2021, the report must meet the following requirements:

(1) The NMOC emission rate report must contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in §63.1959(a) or (b), as applicable.

(i) The initial NMOC emission rate report must be submitted no later than 90 days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after March 12, 1996.

(ii) Subsequent NMOC emission rate reports must be submitted annually thereafter, except as provided for in paragraph (c)(1)(ii)(A) of this section.

(A) If the estimated NMOC emission rate as reported in the annual report to the Administrator is less than 50 Mg/yr in each of the next 5 consecutive years, the owner or operator may elect to submit, an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate must include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based must be provided to the Administrator. This estimate must be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised 5-year estimate must be submitted to the Administrator. The revised estimate must cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

(B) The report must be submitted following the procedure specified in paragraph (l)(2) of this section.

(2) The NMOC emission rate report must include all the data, calculations, sample reports and measurements used to estimate the annual or 5-year emissions.

(3) Each owner or operator subject to the requirements of this subpart is exempted from the requirements to submit an NMOC emission rate report, after installing a collection and control system that complies with §63.1959(b)(2), during such time as the collection and control system is in operation and in compliance with §§63.1958 and 63.1960.

(d) *Collection and control system design plan.* Each owner or operator subject to the provisions of §63.1959(b)(2) must submit a collection and control system design plan to the Administrator for approval according to §60.757(c) of this chapter and the schedule in §60.757(c)(1) and (2). Beginning no later than September 27, 2021, each owner or operator subject to the provisions of §63.1959(b)(2) must submit a collection and control system design plan to the Administrator according to paragraphs (d)(1) through (6) of this section. The collection and control system design plan must be prepared and approved by a professional engineer.

(1) The collection and control system as described in the design plan must meet the design requirements in §63.1959(b)(2).

(2) The collection and control system design plan must include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of §§63.1957 through 63.1983 proposed by the owner or operator.

(3) The collection and control system design plan must either conform with specifications for active collection systems in §63.1962 or include a demonstration to the Administrator's satisfaction of the sufficiency of the alternative provisions to §63.1962.

(4) Each owner or operator of an MSW landfill affected by this subpart must submit a collection and control system design plan to the Administrator for approval within 1 year of becoming subject to this subpart.

(5) The landfill owner or operator must notify the Administrator that the design plan is completed and submit a copy of the plan's signature page. The Administrator has 90 days to decide whether the design plan should be submitted for review. If the Administrator chooses to review the plan, the approval process continues as described in paragraph (d)(6) of this section. In the event that the design plan is required to be modified to obtain approval, the owner or operator must take any steps necessary to conform any prior actions to the approved design plan and any failure to do so could result in an enforcement action.

(6) Upon receipt of an initial or revised design plan, the Administrator must review the information submitted under paragraphs (d)(1) through (3) of this section and either approve it, disapprove it, or request that additional information be submitted. Because of the many site-specific factors involved with landfill gas system design, alternative systems may be necessary. A wide variety of system designs are possible, such as vertical wells, combination horizontal and vertical collection systems, or horizontal trenches only, leachate collection components, and passive systems.

(e) *Revised design plan.* Beginning no later than September 27, 2021, the owner or operator who has already been required to submit a design plan under paragraph (d) of this section must submit a revised design plan to the Administrator for approval as follows:

(1) At least 90 days before expanding operations to an area not covered by the previously approved design plan.

(2) Prior to installing or expanding the gas collection system in a way that is not consistent with the design plan that was submitted to the Administrator according to paragraph (d) of this section.

(f) *Closure report.* Each owner or operator of a controlled landfill must submit a closure report to the Administrator within 30 days of waste acceptance cessation. The Administrator may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of §258.60 of this chapter. If a closure report has been submitted to the Administrator, no additional wastes may be placed into the landfill without filing a notification of modification as described under §63.9(b) of subpart A.

(g) *Equipment removal report.* Each owner or operator of a controlled landfill must submit an equipment removal report as provided in §60.757(e) of this chapter. Each owner or operator of a controlled landfill must submit an equipment removal report to the Administrator 30 days prior to removal or cessation of operation of the control equipment.

(1) Beginning no later than September 27, 2021, the equipment removal report must contain all of the following items:

(i) A copy of the closure report submitted in accordance with paragraph (f) of this section;

(ii) A copy of the initial performance test report demonstrating that the 15-year minimum control period has expired, or information that demonstrates that the gas collection and control system will be unable to operate for 15 years due to declining gas flows. In the equipment removal report, the process unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's Central Data Exchange (CDX); and

(iii) Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 Mg or greater of NMOC per year. If the NMOC emission rate reports have been previously submitted to the EPA's CDX, a statement that the NMOC emission rate reports have been submitted

electronically and the dates that the reports were submitted to the EPA's CDX may be submitted in the equipment removal report in lieu of the NMOC emission rate reports.

(2) The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in §63.1957(b) have been met.

(h) *Semi-annual report.* The owner or operator of a landfill seeking to comply with §63.1959(b)(2) using an active collection system designed in accordance with §63.1959(b)(2)(ii) must submit to the Administrator semi-annual reports. Beginning no later than September 27, 2021, you must submit the report, following the procedure specified in paragraph (l) of this section. The initial report must be submitted within 180 days of installation and startup of the collection and control system and must include the initial performance test report required under §63.7 of subpart A, as applicable. In the initial report, the process unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX. For enclosed combustion devices and flares, reportable exceedances are defined under §63.1983(c). The semi-annual reports must contain the information in paragraphs (h)(1) through (8) of this section.

(1) Number of times that applicable parameters monitored under §63.1958(b), (c), and (d) were exceeded and when the gas collection and control system was not operating under §63.1958(e), including periods of SSM. For each instance, report the date, time, and duration of each exceedance.

(i) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the temperature and nitrogen or oxygen operational standards in introductory paragraph §63.1958(c), provide a statement of the wellhead operational standard for temperature and oxygen you are complying with for the period covered by the report. Indicate the number of times each of those parameters monitored under §63.1961(a)(3) were exceeded. For each instance, report the date, time, and duration of each exceedance.

(ii) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in §63.1958(c)(1), provide a statement of the wellhead operational standard for temperature and oxygen you are complying with for the period covered by the report. Indicate the number of times each of those parameters monitored under §63.1961(a)(4) were exceeded. For each instance, report the date, time, and duration of each exceedance.

(iii) Beginning no later than September 27, 2021, number of times the parameters for the site-specific treatment system in §63.1961(g) were exceeded.

(2) Description and duration of all periods when the gas stream was diverted from the control device or treatment system through a bypass line or the indication of bypass flow as specified under §63.1961.

(3) Description and duration of all periods when the control device or treatment system was not operating and length of time the control device or treatment system was not operating.

(4) All periods when the collection system was not operating.

(5) The location of each exceedance of the 500-ppm methane concentration as provided in §63.1958(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month. Beginning no later than September 27, 2021, for location, you record the latitude and longitude coordinates of each exceedance using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.

(6) The date of installation and the location of each well or collection system expansion added pursuant to §63.1960(a)(3) and (4), (b), and (c)(4).

(7) For any corrective action analysis for which corrective actions are required in §63.1960(a)(3)(i) or (a)(5) and that take more than 60 days to correct the exceedance, the root cause analysis conducted, including a description of the recommended corrective action(s), the date for corrective action(s) already completed following the positive pressure or high temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

(8) Each owner or operator required to conduct enhanced monitoring in §§63.1961(a)(5) and (6) must include the results of all monitoring activities conducted during the period.

(i) For each monitoring point, report the date, time, and well identifier along with the value and units of measure for oxygen, temperature (wellhead and downwell), methane, and carbon monoxide.

(ii) Include a summary trend analysis for each well subject to the enhanced monitoring requirements to chart the weekly readings over time for oxygen, wellhead temperature, methane, and weekly or monthly readings over time, as applicable for carbon monoxide.

(iii) Include the date, time, staff person name, and description of findings for each visual observation for subsurface oxidation event.

(i) *Initial performance test report.* Each owner or operator seeking to comply with §63.1959(b)(2)(iii) must include the following information with the initial performance test report required under §63.7 of subpart A:

(1) A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;

(2) The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;

(3) The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;

(4) The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area;

(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.

(j) *Corrective action and the corresponding timeline.* The owner or operator must submit information regarding corrective actions according to paragraphs (j)(1) and (2) of this section.

(1) For corrective action that is required according to §63.1960(a)(3) or (4) and is not completed within 60 days after the initial exceedance, you must submit a notification to the Administrator as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature exceedance.

(2) For corrective action that is required according to §63.1960(a)(3) or (4) and is expected to take longer than 120 days after the initial exceedance to complete, you must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature monitoring value of 62.8 degrees Celsius (145 degrees Fahrenheit) or above. The Administrator must approve the plan for corrective action and the corresponding timeline.

(k) *24-hour high temperature report.* Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in §63.1958(c)(1) and a landfill gas temperature measured at either the wellhead or at any point in the well is greater than or equal to 76.7 degrees Celsius (170 degrees Fahrenheit) and the carbon monoxide concentration measured is greater than or equal to 1,000 ppmv, then you must report the date, time, well identifier, temperature and carbon monoxide reading via email to the Administrator within 24 hours of the measurement unless a higher operating temperature value has been approved by the Administrator for the well under this subpart or under 40 CFR part 60, subpart WWW; 40 CFR part 60, subpart XXX; or a Federal plan or EPA approved and effective state plan or tribal plan that implements either 40 CFR part 60, subpart Cc or 40 CFR part 60, subpart Cf.

(l) *Electronic reporting.* Beginning no later than September 27, 2021, the owner or operator must submit reports electronically according to paragraphs (l)(1) and (2) of this section.

(1) Within 60 days after the date of completing each performance test required by this subpart, you must submit the results of the performance test following the procedures specified in paragraphs (l)(1)(i) through (iii) of this section.

(i) Data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT website (*https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert*) at the time of the test. Submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI), which can be accessed through the EPA's CDX (*https://cdx.epa.gov/*). The data must be submitted in a file format generated through the use of the EPA's ERT. Alternatively, you may submit an electronic file consistent with the extensible markup language (XML) schema listed on the EPA's ERT website.

(ii) Data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT website at the time of the test. The results of the performance test must be included as an attachment in the ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website. Submit the ERT generated package or alternative file to the EPA via CEDRI.

(iii) Confidential business information (CBI). If you claim some of the information submitted under paragraph (a) of this section is CBI, you must submit a complete file, including information claimed to be CBI, to the EPA. The file must be generated through the use of the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website. Submit the file on a compact disc, flash drive, or other commonly used electronic storage medium and clearly mark the medium as CBI. Mail the electronic medium to U.S. EPA/OAQPS/CORE CBI Office, Attention: Group Leader, Measurement Policy Group, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same file with the CBI omitted must be submitted to the EPA via the EPA's CDX as described in paragraph (l)(1)(i) of this section.

(2) Each owner or operator required to submit reports following the procedure specified in this paragraph must submit reports to the EPA via CEDRI. CEDRI can be accessed through the EPA's CDX. The owner or operator must use the appropriate electronic report in CEDRI for this subpart or an alternate electronic file format consistent with the XML schema listed on the CEDRI website (*https://www.epa.gov/electronic-reporting-air-emissions/compliance-and-emissions-data-reporting-interface-cedri*). Once the spreadsheet template upload/forms for the reports have been available in CEDRI for 90 days, the owner or operator must

begin submitting all subsequent reports via CEDRI. The reports must be submitted by the deadlines specified in this subpart, regardless of the method in which the reports are submitted. The NMOC emission rate reports, semi-annual reports, and bioreactor 40-percent moisture reports should be electronically reported as a spreadsheet template upload/form to CEDRI. If the reporting forms specific to this subpart are not available in CEDRI at the time that the reports are due, the owner or operator must submit the reports to the Administrator at the appropriate address listed in §63.13 of subpart A.

(m) *Claims of EPA system outage.* Beginning no later than September 27, 2021, if you are required to electronically submit a report through CEDRI in the EPA's CDX, you may assert a claim of EPA system outage for failure to comply timely with the reporting requirement. To assert a claim of EPA system outage, you must meet the following requirements:

(1) You must have been or will be precluded from accessing CEDRI and submitting a required report within the time prescribed due to an outage of either the EPA's CEDRI or CDX systems.

(2) The outage must have occurred within the period of time beginning 5 business days prior to the date that the submission is due.

(3) The outage may be planned or unplanned.

(4) You must submit notification to the Administrator in writing as soon as possible following the date you first knew, or through due diligence should have known, that the event may cause or has caused a delay in reporting.

(5) You must provide to the Administrator a written description identifying:

(i) The date(s) and time(s) when CDX or CEDRI was accessed and the system was unavailable;

(ii) A rationale for attributing the delay in reporting beyond the regulatory deadline to EPA system outage;

(iii) Measures taken or to be taken to minimize the delay in reporting; and

(iv) The date by which you propose to report, or if you have already met the reporting requirement at the time of the notification, the date you reported.

(6) The decision to accept the claim of EPA system outage and allow an extension to the reporting deadline is solely within the discretion of the Administrator.

(7) In any circumstance, the report must be submitted electronically as soon as possible after the outage is resolved.

(n) *Claims of force majeure.* Beginning no later than September 2, 2021, if you are required to electronically submit a report through CEDRI in the EPA's CDX, you may assert a claim of force majeure for failure to comply timely with the reporting requirement. To assert a claim of force majeure, you must meet the following requirements:

(1) You may submit a claim if a force majeure event is about to occur, occurs, or has occurred or there are lingering effects from such an event within the period of time beginning 5 business days prior to the date the submission is due. For the purposes of this section, a force majeure event is defined as an event that will be or has been caused by circumstances beyond the control of the affected facility, its contractors, or any entity

controlled by the affected facility that prevents you from complying with the requirement to submit a report electronically within the time period prescribed. Examples of such events are acts of nature (*e.g.*, hurricanes, earthquakes, or floods), acts of war or terrorism, or equipment failure or safety hazard beyond the control of the affected facility (*e.g.*, large scale power outage).

(2) You must submit notification to the Administrator in writing as soon as possible following the date you first knew, or through due diligence should have known, that the event may cause or has caused a delay in reporting.

(3) You must provide to the Administrator:

(i) A written description of the force majeure event;

(ii) A rationale for attributing the delay in reporting beyond the regulatory deadline to the force majeure event;

(iii) Measures taken or to be taken to minimize the delay in reporting; and

(iv) The date by which you propose to report, or if you have already met the reporting requirement at the time of the notification, the date you reported.

(4) The decision to accept the claim of force majeure and allow an extension to the reporting deadline is solely within the discretion of the Administrator.

(5) In any circumstance, the reporting must occur as soon as possible after the force majeure event occurs.

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§63.1982 What records and reports must I submit and keep for bioreactors or liquids addition other than leachate?

Submit reports as specified in this section and §63.1981. Keep records as specified in this section and §63.1983.

(a) For bioreactors at new affected sources you must submit the initial semi-annual compliance report and performance test results described in §63.1981(h) within 180 days after the date you are required to begin operating the gas collection and control system by §63.1947(a)(2).

(b) If you must submit a semi-annual compliance report for a bioreactor as well as a semi-annual compliance report for a conventional portion of the same landfill, you may delay submittal of a subsequent semi-annual compliance report for the bioreactor according to paragraphs (b)(1) through (3) of this section so that the reports may be submitted on the same schedule.

(1) After submittal of your initial semi-annual compliance report and performance test results for the bioreactor, you may delay submittal of the subsequent semi-annual compliance report for the bioreactor until the date the initial or subsequent semi-annual compliance report is due for the conventional portion of your landfill.

(2) You may delay submittal of your subsequent semi-annual compliance report by no more than 12 months after the due date for submitting the initial semi-annual compliance report and performance test results

described in §63.1981(h) for the bioreactor. The report must cover the time period since the previous semi-annual report for the bioreactor, which would be a period of at least 6 months and no more than 12 months.

(3) After the delayed semi-annual report, all subsequent semi-annual reports for the bioreactor must be submitted every 6 months on the same date the semi-annual report for the conventional portion of the landfill is due.

(c) If you add any liquids other than leachate in a controlled fashion to the waste mass and do not comply with the bioreactor requirements in §§63.1947, 63.1955(b), and paragraphs (a) and (b) of this section, you must keep a record of calculations showing that the percent moisture by weight expected in the waste mass to which liquid is added is less than 40 percent. The calculation must consider the waste mass, moisture content of the incoming waste, mass of water added to the waste including leachate recirculation and other liquids addition and precipitation, and the mass of water removed through leachate or other water losses. Moisture level sampling or mass balances calculations can be used. You must document the calculations and the basis of any assumptions. Keep the record of the calculations until you cease liquids addition.

(d) If you calculate moisture content to establish the date your bioreactor is required to begin operating the collection and control system under §63.1947(a)(2) or (c)(2), keep a record of the calculations including the information specified in paragraph (e) of this section for 5 years. Within 90 days after the bioreactor achieves 40-percent moisture content, report the results of the calculation, the date the bioreactor achieved 40-percent moisture content by weight, and the date you plan to begin collection and control system operation to the Administrator. Beginning no later than September 27, 2021, the reports should be submitted following the procedure specified in §63.1981(l)(2).

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§63.1983 What records must I keep?

You must keep records as specified in this subpart. You must also keep records as specified in the general provisions of 40 CFR part 63 as shown in Table 1 to this subpart.

(a) Except as provided in §63.1981(d)(2), each owner or operator of an MSW landfill subject to the provisions of §63.1959(b)(2)(ii) and (iii) of this chapter must keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report that triggered §63.1959(b), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(b) Except as provided in §63.1981(d)(2), each owner or operator of a controlled landfill must keep up-to-date, readily accessible records for the life of the control system equipment of the data listed in paragraphs (b)(1) through (5) of this section as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring must be maintained for a minimum of 5 years. Records of the control device vendor specifications must be maintained until removal.

(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §63.1959(b)(2)(ii):

(i) The maximum expected gas generation flow rate as calculated in §63.1960(a)(1).

(ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in §63.1962(a)(1) and (2).

(2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §63.1959(b)(2)(iii) through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts:

(i) The average temperature measured at least every 15 minutes and averaged over the same time period of the performance test.

(ii) The percent reduction of NMOC determined as specified in §63.1959(b)(2)(iii)(B) achieved by the control device.

(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §63.1959(b)(2)(iii)(B)(*1*) through use of a boiler or process heater of any size: A description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing.

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §63.1959(b)(2)(iii)(A) through use of a non-enclosed flare, the flare type (*i.e.*, steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in §63.11; continuous records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame or the flare flame is absent.

(5) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §63.1959(b)(2)(iii)(C) through use of a landfill gas treatment system:

(i) *Bypass records.* Records of the flow of landfill gas to, and bypass of, the treatment system.

(ii) *Site-specific treatment monitoring plan.* Beginning no later than September 27, 2021, the owner or operator must prepare a site-specific treatment monitoring plan to include:

(A) Monitoring records of parameters that are identified in the treatment system monitoring plan and that ensure the treatment system is operating properly for each intended end use of the treated landfill gas. At a minimum, records should include records of filtration, de-watering, and compression parameters that ensure the treatment system is operating properly for each intended end use of the treated landfill gas.

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

(C) Documentation of the monitoring methods and ranges, along with justification for their use.

(D) List of responsible staff (by job title) for data collection.

(E) Processes and methods used to collect the necessary data.

(F) Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems (CMS).

(c) Except as provided in §63.1981(d)(2), each owner or operator of a controlled landfill subject to the provisions of this subpart must keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in §63.1961 as well as up-to-date, readily accessible

records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.

(1) The following constitute exceedances that must be recorded and reported under §63.1981(h):

(i) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million Btu per hour) or greater, all 3-hour periods of operation during which the average temperature was more than 28 degrees Celsius (82 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with §63.1959(b)(2)(iii) was determined.

(ii) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under paragraph (b)(3) of this section.

(2) Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible continuous records of the indication of flow to the control system and the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under §63.1961(b)(2)(ii), (c)(2)(ii), and (g)(2).

(3) Each owner or operator subject to the provisions of this subpart who uses a boiler or process heater with a design heat input capacity of 44 megawatts or greater to comply with §63.1959(b)(2)(iii) must keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other state, local, tribal, or federal regulatory requirements.

(4) Each owner or operator seeking to comply with the provisions of this subpart by use of a non-enclosed flare must keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under §63.1961(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

(5) Each owner or operator of a landfill seeking to comply with §63.1959(b)(2) using an active collection system designed in accordance with §63.1959(b)(2)(ii) must keep records of periods when the collection system or control device is not operating.

(6) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard in §63.1958(e)(1), the date, time, and duration of each startup and/or shutdown period, recording the periods when the affected source was subject to the standard applicable to startup and shutdown.

(7) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard in §63.1958(e)(1), in the event that an affected unit fails to meet an applicable standard, record the information below in this paragraph:

(i) For each failure record the date, time and duration of each failure and the cause of such events (including unknown cause, if applicable).

(ii) For each failure to meet an applicable standard; record and retain a list of the affected sources or equipment.

(iii) Record actions taken to minimize emissions in accordance with the general duty of §63.1955(c) and any corrective actions taken to return the affected unit to its normal or usual manner of operation.

(8) Beginning no later than September 27, 2021, in lieu of the requirements specified in §63.8(d)(3) of subpart A you must keep the written procedures required by §63.8(d)(2) on record for the life of the affected source or until the affected source is no longer subject to the provisions of this part, to be made available for inspection, upon request, by the Administrator. If the performance evaluation plan is revised, you must keep previous (*i.e.*, superseded) versions of the performance evaluation plan on record to be made available for inspection, upon request, by the Administrator, for a period of 5 years after each revision to the plan. The program of corrective action should be included in the plan required under §63.8(d)(2).

(d) Except as provided in §63.1981(d)(2), each owner or operator subject to the provisions of this subpart must keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.

(1) Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under §63.1960(b).

(2) Each owner or operator subject to the provisions of this subpart must keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in §63.1962(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in §63.1962(a)(3)(ii).

(e) Except as provided in §63.1981(d)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of the following:

(1) All collection and control system exceedances of the operational standards in §63.1958, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

(2) Each owner or operator subject to the control provisions of this subpart must keep records of each wellhead temperature monitoring value of greater than 55 degrees Celsius (131 degrees Fahrenheit), each wellhead nitrogen level at or above 20 percent, and each wellhead oxygen level at or above 5 percent, except:

(i) When an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the compliance provisions for wellhead temperature in §63.1958(c)(1), but no later than September 27, 2021, the records of each wellhead temperature monitoring value of 62.8 degrees Celsius (145 degrees Fahrenheit) or above instead of values greater than 55 degrees Celsius (131 degrees Fahrenheit).

(ii) Each owner or operator required to conduct the enhanced monitoring provisions in §63.1961(a)(5), must also keep records of all enhanced monitoring activities.

(iii) Each owner or operator required to submit the *24-hour high temperature report in* §63.1981(k), must also keep a record of the email transmission.

(3) For any root cause analysis for which corrective actions are required in §63.1960(a)(3)(i)(A) or (a)(4)(i)(A), keep a record of the root cause analysis conducted, including a description of the recommended corrective action(s) taken, and the date(s) the corrective action(s) were completed.

(4) For any root cause analysis for which corrective actions are required in §63.1960(a)(3)(i)(B) or (a)(4)(i)(B), keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading,

and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

(5) For any root cause analysis for which corrective actions are required in §63.1960(a)(3)(i)(C) or (a)(4)(i)(C), keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates, and a copy of any comments or final approval on the corrective action analysis or schedule from the Administrator.

(f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million Mg or 2.5 million m^3, as provided in the definition of "design capacity," must keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(g) Except as provided in §63.1981(d)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of all collection and control system monitoring data for parameters measured in §63.1961(a)(1) through (6).

(h) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with the operational standard for temperature in §63.1958(c)(1), you must keep the following records.

(1) Records of the landfill gas temperature on a monthly basis as monitored in §63.1960(a)(4).

(2) Records of enhanced monitoring data at each well with a measurement of landfill gas temperature greater than 62.8 degrees Celsius (145 degrees Fahrenheit) as gathered in §63.1961(a)(5) and (6).

(i) Any records required to be maintained by this subpart that are submitted electronically via the EPA's CEDRI may be maintained in electronic format. This ability to maintain electronic copies does not affect the requirement for facilities to make records, data, and reports available upon request to a delegated air agency or the EPA as part of an on-site compliance evaluation.

(ii) [Reserved]

[85 FR 17261, Mar. 26, 2020, as amended at 85 FR 64401, Oct. 13, 2020]

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OTHER REQUIREMENTS AND INFORMATION

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§63.1985 Who enforces this subpart?

(a) This subpart can be implemented and enforced by the EPA, or a delegated authority such as the applicable state, local, or tribal agency. If the EPA Administrator has delegated authority to a state, local, or tribal agency, then that agency as well as the EPA has the authority to implement and enforce this subpart. Contact the applicable EPA Regional office to find out if this subpart is delegated to a state, local, or tribal agency.

(b) In delegating implementation and enforcement authority of this subpart to a state, local, or tribal agency under subpart E of this part, the authorities contained in paragraph (c) of this section are retained by the EPA Administrator and are not transferred to the state, local, or tribal agency.

(c) The authorities that will not be delegated to state, local, or tribal agencies are as follows. Approval of alternatives to the standards in §§63.1955 through 63.1962. Where this subpart references 40 CFR part 60, subpart WWW, the cited provisions will be delegated according to the delegation provisions of 40 CFR part 60, subpart WWW. For this subpart, the EPA also retains the authority to approve methods for determining the NMOC concentration in §63.1959(a)(3) and the method for determining the site-specific methane generation rate constant k in §63.1959(a)(4).

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§63.1990 What definitions apply to this subpart?

Terms used in this subpart are defined in the Clean Air Act, 40 CFR part 60, subparts A, Cc, Cf, WWW, and XXX; 40 CFR part 62, subpart GGG, and subpart A of this part, and this section that follows:

Active collection system means a gas collection system that uses gas mover equipment.

Active landfill means a landfill in which solid waste is being placed or a landfill that is planned to accept waste in the future.

Bioreactor means an MSW landfill or portion of an MSW landfill where any liquid other than leachate (leachate includes landfill gas condensate) is added in a controlled fashion into the waste mass (often in combination with recirculating leachate) to reach a minimum average moisture content of at least 40 percent by weight to accelerate or enhance the anaerobic (without oxygen) biodegradation of the waste.

Closed area means a separately lined area of an MSW landfill in which solid waste is no longer being placed. If additional solid waste is placed in that area of the landfill, that landfill area is no longer closed. The area must be separately lined to ensure that the landfill gas does not migrate between open and closed areas.

Closed landfill means a landfill in which solid waste is no longer being placed, and in which no additional solid wastes will be placed without first filing a notification of modification as prescribed under §63.9(b). Once a notification of modification has been filed, and additional solid waste is placed in the landfill, the landfill is no longer closed.

Closure means that point in time when a landfill becomes a closed landfill.

Commercial solid waste means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

Controlled landfill means any landfill at which collection and control systems are required under this subpart as a result of the nonmethane organic compounds emission rate. The landfill is considered controlled at the time a collection and control system design plan is submitted in compliance with §60.752(b)(2)(i) of this chapter or in compliance with §63.1959(b)(2)(i).

Corrective action analysis means a description of all reasonable interim and long-term measures, if any, that are available, and an explanation of why the selected corrective action(s) is/are the best alternative(s), including, but not limited to, considerations of cost effectiveness, technical feasibility, safety, and secondary impacts.

Cover penetration means a wellhead, a part of a landfill gas collection or operations system, and/or any other object that completely passes through the landfill cover. The landfill cover includes that portion which covers the waste, as well as the portion which borders the waste extended to the point where it is sealed with the landfill liner or the surrounding land mass. Examples of what is not a penetration for purposes of this subpart include but are not limited to: Survey stakes, fencing including litter fences, flags, signs, utility posts, and trees so long as these items do not pass through the landfill cover.

Design capacity means the maximum amount of solid waste a landfill can accept, as indicated in terms of volume or mass in the most recent permit issued by the state, local, or tribal agency responsible for regulating the landfill, plus any in-place waste not accounted for in the most recent permit. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million Mg or 2.5 million m^3, the calculation must include a site-specific density, which must be recalculated annually.

Deviation before September 28, 2021, means any instance in which an affected source subject to this subpart, or an owner or operator of such a source:

(1) Fails to meet any requirement or obligation established by this subpart, including, but not limited to, any emissions limitation (including any operating limit) or work practice requirement;

(2) Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit; or

(3) Fails to meet any emission limitation, (including any operating limit), or work practice requirement in this subpart during SSM, regardless of whether or not such failure is permitted by this subpart.

Deviation beginning no later than September 27, 2021, means any instance in which an affected source subject to this subpart or an owner or operator of such a source:

(1) Fails to meet any requirement or obligation established by this subpart including but not limited to any emission limit, or operating limit, or work practice requirement; or

(2) Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit.

Disposal facility means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

Emissions limitation means any emission limit, opacity limit, operating limit, or visible emissions limit.

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 is considered an enclosed combustor.

EPA approved State plan means a State plan that EPA has approved based on the requirements in 40 CFR part 60, subpart B to implement and enforce 40 CFR part 60, subparts Cc or Cf. An approved state plan becomes effective on the date specified in the document published in the FEDERAL REGISTER announcing EPA's approval.

EPA approved Tribal plan means a plan submitted by a tribal authority pursuant to 40 CFR parts 9, 35, 49, 50, and 81 to implement and enforce 40 CFR part 60, subpart Cc or subpart Cf.

Federal plan means the EPA plan to implement 40 CFR part 60, subparts Cc or Cf for existing MSW landfills located in states and Indian country where state plans or tribal plans are not currently in effect. On the effective date of an EPA approved state or tribal plan, the Federal Plan no longer applies. The Federal Plan implementing 40 CFR part 60, subpart Cc is found at 40 CFR part 62, subpart GGG.

Flare means an open combustor without enclosure or shroud.

Gas mover equipment means the equipment (*i.e.,* fan, blower, compressor) used to transport landfill gas through the header system.

Household waste means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including, but not limited to, single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas). Household waste does not include fully segregated yard waste. Segregated yard waste means vegetative matter resulting exclusively from the cutting of grass, the pruning and/or removal of bushes, shrubs, and trees, the weeding of gardens, and other landscaping maintenance activities. Household waste does not include construction, renovation, or demolition wastes, even if originating from a household.

Industrial solid waste means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under Subtitle C of the Resource Conservation and Recovery Act, 40 CFR parts 264 and 265. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: Electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.

Interior well means any well or similar collection component located inside the perimeter of the landfill waste. A perimeter well located outside the landfilled waste is not an interior well.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile as those terms are defined under §257.2 of this chapter.

Lateral expansion means a horizontal expansion of the waste boundaries of an existing MSW landfill. A lateral expansion is not a modification unless it results in an increase in the design capacity of the landfill.

Leachate recirculation means the practice of taking the leachate collected from the landfill and reapplying it to the landfill by any of one of a variety of methods, including pre-wetting of the waste, direct discharge into the working face, spraying, infiltration ponds, vertical injection wells, horizontal gravity distribution systems, and pressure distribution systems.

Modification means an increase in the permitted volume design capacity of the landfill by either lateral or vertical expansion based on its permitted design capacity after November 7, 2000. Modification does not occur until the owner or operator commences construction on the lateral or vertical expansion.

Municipal solid waste landfill or *MSW landfill* means an entire disposal facility in a contiguous geographical space where household waste is placed in or on land. An MSW landfill may also receive other types of RCRA Subtitle D wastes (§257.2 of this chapter) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of an MSW landfill may be separated by access roads. An MSW landfill may be publicly or privately owned. An MSW landfill may be a new MSW landfill, an existing MSW landfill, or a lateral expansion.

Municipal solid waste landfill emissions or *MSW landfill emissions* means gas generated by the decomposition of organic waste deposited in an MSW landfill or derived from the evolution of organic compounds in the waste.

NMOC means nonmethane organic compounds, as measured according to the provisions of §63.1959.

Nondegradable waste means any waste that does not decompose through chemical breakdown or microbiological activity. Examples are, but are not limited to, concrete, municipal waste combustor ash, and metals.

Passive collection system means a gas collection system that solely uses positive pressure within the landfill to move the gas rather than using gas mover equipment.

Root cause analysis means an assessment conducted through a process of investigation to determine the primary cause, and any other contributing causes, of an exceedance of a standard operating parameter at a wellhead.

Segregated yard waste means vegetative matter resulting exclusively from the cutting of grass, the pruning and/or removal of bushes, shrubs, and trees, the weeding of gardens, and other landscaping maintenance activities.

Sludge means the term sludge as defined in §258.2 of this chapter.

Solid waste means the term solid waste as defined in §258.2 of this chapter.

Sufficient density means any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors, and surface collectors, necessary to maintain emission and migration control as determined by measures of performance set forth in this subpart.

Sufficient extraction rate means a rate sufficient to maintain a negative pressure at all wellheads in the collection system without causing air infiltration, including any wellheads connected to the system as a result of expansion or excess surface emissions, for the life of the blower.

Treated landfill gas means landfill gas processed in a treatment system as defined in this subpart.

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

Untreated landfill gas means any landfill gas that is not treated landfill gas.

Work practice requirement means any design, equipment, work practice, or operational standard, or combination thereof, that is promulgated pursuant to section 112(h) of the Clean Air Act.

Subpart OOO - Federal Plan Requirements for Municipal Solid Waste Landfills That Commenced Construction On or Before July 17, 2014 and Have Not Been Modified or Reconstructed Since July 17, 2014

Source: 86 FR 27770, May 21, 2021, unless otherwise noted.

§ 62.16710 Scope and delegated authorities.

This subpart establishes emission control requirements and compliance schedules for the control of designated pollutants from certain designated municipal solid waste (MSW) landfills in accordance with section 111(d) of the Clean Air Act and subpart B of 40 CFR part 60.

(a) If you own or operate a designated facility as described in § 62.16711, then you must comply with this subpart.

(b) The following authorities will not be delegated to state, local, or tribal agencies:

(1) Approval of alternative methods to determine the site-specific nonmethane organic compounds (NMOC) concentration or a site-specific methane generation rate constant (k).

(2) Alternative emission standards.

(3) Major alternatives to test methods. Major alternatives to test methods or to monitoring are modifications made to a federally enforceable test method or to a Federal monitoring requirement. These changes may involve the use of unproven technology or modified procedures or an entirely new method.

(4) Waivers of recordkeeping.

§ 62.16711 Designated facilities.

(a) The designated facility to which this subpart applies is each municipal solid waste landfill in each state, protectorate, and portion of Indian country that meets the conditions of paragraphs (a)(1) and (2) of this section, except for landfills exempted by paragraphs (b) and (c) of this section.

(1) The municipal solid waste landfill commenced construction, reconstruction, or modification on or before July 17, 2014.

(2) The municipal solid waste landfill has accepted waste at any time since November 8, 1987, or the landfill has additional capacity for future waste deposition.

(b) A municipal solid waste landfill regulated by an EPA-approved and currently effective state or tribal plan implementing 40 CFR 60, subpart Cf, is not subject to the requirements of this subpart.

(c) A municipal solid waste landfill located in a state, locality, or portion of Indian country that submitted a negative declaration letter is not subject to the requirements of this subpart other than the requirements in the definition of design capacity in § 62.16730 to recalculate the site-specific density annually and in § 62.16724(b) to submit an amended design capacity report in the event that the recalculated design capacity is equal to or greater than 2.5 million megagrams and 2.5 million cubic meters. However, if the existing municipal solid waste landfill already has a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, then it is subject to the requirements of this Federal plan.

(d) Physical or operational changes made to an existing MSW landfill solely to comply with an emission guideline implemented by a state or Federal plan are not considered a modification or reconstruction and would not subject an existing MSW landfill to the requirements of 40 CFR 60, subpart XXX. Landfills that commence construction, modification, or reconstruction after July 17, 2014, are subject to 40 CFR part 60, subpart XXX.

(e) For purposes of obtaining an operating permit under title V of the Clean Air Act, the owner or operator of an MSW landfill subject to this subpart with a design capacity less than 2.5 million megagrams or 2.5 million cubic meters is not subject to the requirement to obtain an operating permit for the landfill under 40 CFR part 70 or 71, unless the landfill is otherwise subject to either 40 CFR part 70 or 71. For purposes of submitting a timely application for an operating permit under 40 CFR part 70 or 71, the owner or operator of an MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters, and not otherwise subject to either 40 CFR part 70 or 71, becomes subject to the requirements of § 70.5(a)(1)(i) or 71.5(a)(1)(i) of this chapter 90 days after the effective date of such CAA section 111(d) program approval, even if the design capacity report is submitted earlier.

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

(1) The landfill was never subject to the requirement to install and operate a gas collection and control system under § 62.16714; or

(2) The landfill meets the conditions for control system removal specified in § 62.16714(f).

(g) When an MSW landfill subject to this subpart is in the closed landfill subcategory, the owner or operator is not subject to the following reports of this subpart, provided the owner or operator submitted these reports under the provisions of 40 CFR part 60, subpart WWW; subpart GGG of this part; or a state plan implementing 40 CFR part 60, subpart Cc, on or before July 17, 2014:

(1) Initial design capacity report specified in § 62.16724(a).

(2) Initial or subsequent NMOC emission rate report specified in § 62.16724(c), provided that the most recent NMOC emission rate report indicated the NMOC emissions were below 50 megagrams per year.

(3) Collection and control system design plan specified in § 62.16724(d).

(4) Closure report specified in § 62.16724(f).

(5) Equipment removal report specified in § 62.16724(g).

(6) Initial annual report specified in § 62.16724(h).

(7) Initial performance test report in § 62.16724(i).

(h) When an MSW landfill subject to this subpart is a legacy controlled landfill, as defined in § 62.16730, the owner or operator is not subject to the following reports of this subpart, provided the owner or operator submitted these reports under 40 CFR part 60, subpart WWW; subpart GGG of this part; or a state plan implementing 40 CFR part 60, subpart Cc on or before June 21, 2021.

(1) Initial design capacity report specified in § 62.16724(a).

(2) Initial or subsequent NMOC emission rate report specified in § 62.16724(c).

(3) Collection and control system design plan specified in § 62.16724(d).

(5) Initial annual report specified in § 62.16724(h).

(4) Initial performance test report in § 62.16724(i).

§ 62.16712 Compliance schedule and increments of progress.

Planning, awarding of contracts, installing, and starting up MSW landfill air emission collection and control equipment that is capable of meeting the emission standards of § 62.16714 must be completed within 30 months after the date an NMOC emission rate report shows NMOC emissions equal or exceed 34 megagrams per year; or within 30 months after the date of the most recent NMOC emission rate report that shows NMOC emissions equal or exceed 34 megagrams per year, if Tier 4 surface emissions monitoring (SEM) shows a surface emission concentration of 500 parts per million methane or greater. Legacy controlled landfills who have not yet reached increment 5 (full compliance) must demonstrate compliance with any remaining increments of progress on this schedule. However, they must use the date of their first report submitted under 40 CFR part 60, subpart WWW, 40 CFR part 62, subpart GGG or a state plan implementing 40 CFR part 60, subpart Cc showing NMOC emissions at or above 50 megagrams. The owner or operator must follow the requirements in paragraphs (a) through (d) of this section.

(a) ***Increments of progress.*** The owner or operator of a designated facility that has a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters and a NMOC emission rate greater than or equal to 34 megagrams per year must achieve the increments of progress specified in paragraphs (a)(1) through (5) of this section to install air pollution control devices to meet the emission standards specified in § 62.16714(b) and (c) of this subpart. Refer to § 62.16730 for a definition of each increment of progress.

(1) ***Submit control plan.*** Submit a final control plan (collection and control system design plan) according to the requirements of § 62.16724(d).

(2) ***Award contract(s).*** Award contract(s) to initiate on-site construction or initiate on-site installation of emission collection and/or control equipment.

(3) ***Initiate on-site construction.*** Initiate on-site construction or initiate on-site installation of emission collection and/or control equipment as described in the EPA-approved final control plan.

(4) ***Complete on-site construction.*** Complete on-site construction and installation of emission collection and/or control equipment.

(5) ***Achieve final compliance.*** Complete construction in accordance with the design specified in the EPA-approved final control plan and connect the landfill gas collection system and air pollution control equipment such that they are fully operating. The initial performance test must be conducted within 180 days after the date the facility is required to achieve final compliance. For a legacy controlled landfill, the initial or most recent performance test conducted to comply with 40 CFR part 60, subpart WWW, subpart GGG of this part, or a state plan implementing 40 CFR part 60, subpart Cc is sufficient for compliance with this part. The test report does not have to be resubmitted.

(b) ***Compliance date.*** For each designated facility that has a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters and a NMOC emission rate greater than or equal to 34 megagrams per year (50 megagrams per year for closed landfill subcategory), planning, awarding of contracts, and installation of municipal solid waste landfill air emission collection and control equipment capable of meeting the standards in § 62.16714(b) and (c) must be accomplished within 30 months after the date the initial emission rate report (or the annual emission rate report) first shows that the NMOC emission rate equals or exceeds 34 megagrams per year (50 megagrams per year for closed landfill subcategory), except as provided in § 62.16712(c)(3).

(c) ***Compliance schedules.*** The owner or operator of a designated facility that has a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters and a NMOC emission rate greater than or equal to 34 megagrams per year (50 megagrams per year for closed landfill subcategory) must achieve the increments of progress specified in paragraphs (a)(1) through (5) of this section according to the schedule specified in paragraph (c)(1), (2), or (3) of this section.

(1) ***Achieving Increments of Progress.*** The owner or operator of a designated facility must achieve the increments of progress according to the schedule in table 1 of this subpart. Once this subpart becomes effective, any designated facility to which this subpart applies will remain subject to the schedule in table 1 if a subsequently approved state or tribal plan contains a less stringent schedule, (*i.e.*, a schedule that provides more time to comply with increments 1, 4 and/or 5 than does this Federal plan).

(2) ***Tier 4.*** The owner or operator of a designated facility that is using the Tier 4 procedures specified in § 62.16718(a)(6) must achieve the increments of progress according to the schedule in table 1 of this subpart.

(d) ***Alternative dates.*** For designated facilities that are subject to the schedule requirements of paragraph (c)(1) of this section, the owner or operator (or the state or tribal air pollution control authority) may submit to the appropriate EPA Regional Office for approval alternative dates for achieving increments 2 and 3.

§ 62.16714 Standards for municipal solid waste landfill emissions.

(a) ***Landfills.*** Each owner or operator of an MSW landfill having a design capacity greater than or equal to 2.5 million megagrams by mass and 2.5 million cubic meters by volume must collect and control MSW landfill emissions at each MSW landfill that meets the following conditions:

(1) ***Waste acceptance date.*** The landfill has accepted waste at any time since November 8, 1987, or has additional design capacity available for future waste deposition.

(2) ***Construction commencement date.*** The landfill commenced construction, reconstruction, or modification on or before July 17, 2014.

(3) ***NMOC emission rate.*** The landfill has an NMOC emission rate greater than or equal to 34 megagrams per year or Tier 4 SEM shows a surface emission concentration of 500 parts per million methane or greater.

(4) ***Closed subcategory.*** The landfill in the closed landfill subcategory and has an NMOC emission rate greater than or equal to 50 megagrams per year.

(b) ***Collection system.*** Install a gas collection and control system meeting the requirements in paragraphs (b)(1) through (3) and (c) of this section at each MSW landfill meeting the conditions in paragraph (a) of this section.

(1) ***Collection system.*** Install and start up a collection and control system that captures the gas generated within the landfill within 30 months after:

(i) The first annual report in which the NMOC emission rate equals or exceeds 34 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the NMOC emission rate is less than 34 megagrams per year, as specified in § 62.16724(d)(4), or

(ii) The first annual report in which the NMOC emission rate equals or exceeds 50 megagrams per year submitted under previously applicable regulations 40 CFR part 60, subpart WWW, 40 CFR part 62, subpart GGG, or a state plan implementing 40 CFR part 60, subpart Cc for a legacy controlled landfill or landfill in the closed landfill subcategory, or

(iii) The most recent NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year based on Tier 2, if the Tier 4 SEM shows a surface methane emission concentration of 500 parts per million methane or greater as specified in § 62.16724 (d)(4)(iii).

(2) ***Active.*** An active collection system must:

(i) Be designed to handle the maximum expected gas flow rate from the entire area of the landfill that warrants control over the intended use period of the gas control system equipment.

(ii) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade.

(iii) Collect gas at a sufficient extraction rate.

(iv) Be designed to minimize off-site migration of subsurface gas.

(3) ***Passive.*** A passive collection system must:

(i) Comply with the provisions specified in paragraphs (b)(2)(i), (ii), and (iv) of this section.

(ii) Be installed with liners on the bottom and all sides in all areas in which gas is to be collected. The liners must be installed as required under 40 CFR 258.40.

(c) ***Control system.*** Control the gas collected from within the landfill through the use of control devices meeting the following requirements, except as provided in 40 CFR 60.24.

(1) A non-enclosed flare designed and operated in accordance with the parameters established in 40 CFR 60.18 except as noted in § 62.16722(d); or

(2) A control system designed and operated to reduce NMOC by 98 weight percent; or when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts-per-million by

volume, dry basis as hexane at 3-percent oxygen or less. The reduction efficiency or concentration in parts-per-million by volume must be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in § 62.16718(d). The performance test is not required for boilers and process heaters with design heat input capacities equal to or greater than 44 megawatts that burn landfill gas for compliance with this subpart.

(i) If a boiler or process heater is used as the control device, the landfill gas stream must be introduced into the flame zone.

(ii) The control device must be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in § 62.16722.

(iii) Legacy controlled landfills or landfills in the closed landfill subcategory that have already installed control systems and completed initial or subsequent performance tests may comply with this subpart using the initial or most recent performance test conducted to comply with 40 CFR part 60, subpart WWW; subpart GGG of this part; or a state plan implementing subpart Cc of part 60, is sufficient for compliance with this subpart.

(3) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or beneficial use such as fuel for combustion, production of vehicle fuel, production of high-Btu gas for pipeline injection, or use as a raw material in a chemical manufacturing process. Venting of treated landfill gas to the ambient air is not allowed. If the treated landfill gas cannot be routed for subsequent sale or beneficial use, then the treated landfill gas must be controlled according to either paragraph (c)(1) or (2) of this section.

(4) All emissions from any atmospheric vent from the gas treatment system are subject to the requirements of paragraph (b) or (c) of this section. For purposes of this subpart, atmospheric vents located on the condensate storage tank are not part of the treatment system and are exempt from the requirements of paragraph (b) or (c) of this section.

(d) ***Design capacity.*** Each owner or operator of an MSW landfill having a design capacity less than 2.5 million megagrams by mass or 2.5 million cubic meters by volume must submit an initial design capacity report to the Administrator as provided in § 62.16724(a). The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. Any density conversions must be documented and submitted with the report. Submittal of the initial design capacity report fulfills the requirements of this subpart except as provided in paragraphs (d)(1) and (2) of this section.

(1) The owner or operator must submit an amended design capacity report as provided in § 62.16724(b).

(2) When an increase in the maximum design capacity of a landfill with an initial design capacity less than 2.5 million megagrams or 2.5 million cubic meters results in a revised

maximum design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the owner or operator must comply with paragraph (e) of this section.

(e) ***Emissions.*** The owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters must either install a collection and control system as provided in paragraphs (b) and (c) of this section or calculate an initial NMOC emission rate for the landfill using the procedures specified in § 62.16718(a). The NMOC emission rate must be recalculated annually, except as provided in § 62.16724(c)(3).

(1) If the calculated NMOC emission rate is less than 34 megagrams per year, the owner or operator must:

(i) Submit an annual NMOC emission rate report according to § 62.16724(c), except as provided in § 62.16724(c)(3); and

(ii) Recalculate the NMOC emission rate annually using the procedures specified in § 62.16724(a) until such time as the calculated NMOC emission rate is equal to or greater than 34 megagrams per year, or the landfill is closed.

(A) If the calculated NMOC emission rate, upon initial calculation or annual recalculation required in paragraph (e)(1)(ii) of this section, is equal to or greater than 34 megagrams per year, the owner or operator must either: Comply with paragraphs (b) and (c) of this section; calculate NMOC emissions using the next higher tier in § 62.16718; or conduct a surface emission monitoring demonstration using the procedures specified in § 62.16718(a)(6).

(B) If the landfill is permanently closed, a closure report must be submitted to the Administrator as provided in § 62.16724(f), except for exemption allowed under § 62.16711(g)(4).

(2) If the calculated NMOC emission rate is equal to or greater than 34 megagrams per year using Tier 1, 2, or 3 procedures, the owner or operator must either: Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year as specified in § 62.16724(d), except for exemptions allowed under § 62.16711(g)(3); calculate NMOC emissions using a higher tier in § 62.16718; or conduct a surface emission monitoring demonstration using the procedures specified in § 62.16718(a)(6).

(3) For the closed landfill subcategory, if the calculated NMOC emission rate submitted under previously applicable regulations 40 CFR part 60, subpart WWW; 40 CFR part 62, subpart GGG; or a state plan implementing 40 CFR part 60, subpart Cc is equal to or greater than 50 megagrams per year using Tier 1, 2, or 3 procedures, the owner or operator must either: submit a collection and control system design plan as specified in § 62.16724(d), except for exemptions allowed under § 62.16711(g)(3); or calculate NMOC emissions using a higher tier in § 62.16718.

(f) ***Removal criteria.*** The collection and control system may be capped, removed, or decommissioned if the following criteria are met:

(1) The landfill is a closed landfill (as defined in § 62.16730). A closure report must be submitted to the Administrator as provided in § 62.16724(f).

(2) The collection and control system has been in operation a minimum of 15 years or the landfill owner or operator demonstrates that the gas collection and control system will be unable to operate for 15 years due to declining gas flow.

(3) Following the procedures specified in § 62.16718(b), the calculated NMOC emission rate at the landfill is less than 34 megagrams per year on three successive test dates. The test dates must be no less than 90 days apart, and no more than 180 days apart.

(4) For the closed landfill subcategory (as defined in § 62.16730), following the procedures specified in § 62.16718(b), the calculated NMOC emission rate at the landfill is less than 50 megagrams per year on three successive test dates. The test dates must be no less than 90 days apart, and no more than 180 days apart.

§ 62.16716 Operational standards for collection and control systems.

Each owner or operator must comply with the provisions for the operational standards in this section (as well as the provisions in §§ 62.16720 and 62.16722), or the operational standards in § 63.1958 of this chapter (as well as the provisions in §§ 63.1960 and 63.1961 of this chapter), or both as alternative means of compliance, for an MSW landfill with a gas collection and control system used to comply with the provisions of § 62.16714(b) and (c). Once the owner or operator begins to comply with the provisions of § 63.1958 of this chapter, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of this section. Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of § 62.16714(b) and (c) must:

(a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:

(1) 5 years or more if active; or

(2) 2 years or more if closed or at final grade;

(b) Operate the collection system with negative pressure at each wellhead except under the following conditions:

(1) A fire or increased well temperature. The owner or operator must record instances when positive pressure occurs in efforts to avoid a fire. These records must be submitted with the annual reports as provided in § 62.16724(h)(1);

(2) Use of a geomembrane or synthetic cover. The owner or operator must develop acceptable pressure limits in the design plan;

(3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes must be approved by the Administrator as specified in § 62.16724(d);

(c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit). The owner or operator may establish a higher operating temperature value at a particular well. A higher operating value demonstration must be submitted to the Administrator for approval and must include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens. The demonstration must satisfy both criteria in order to be approved (*i.e.*, neither causing fires nor killing methanogens is acceptable).

(d) Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator must conduct surface testing using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in § 62.16720(d). The owner or operator must conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at no more than 30-meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover and all cover penetrations. Thus, the owner or operator must monitor any openings that are within an area of the landfill where waste has been placed and a gas collection system is required. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan must be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

(e) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with § 62.16714(c). In the event the collection or control system is not operating, the gas mover system must be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere must be closed within 1 hour of the collection or control system not operating.

(f) Operate the control system at all times when the collected gas is routed to the system.

(g) If monitoring demonstrates that the operational requirements in paragraphs (b), (c), or (d) of this section are not met, corrective action must be taken as specified in § 62.16720(a)(3) and (5) or § 62.16720(c). If corrective actions are taken as specified in § 62.16720, the monitored exceedance is not a violation of the operational requirements in this section.

§ 62.16718 Test methods and procedures.

Calculate the landfill NMOC emission rate and conduct a surface emission monitoring demonstration according to the provisions in this section.

(a)

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

(i)

(A) Equation 1 must be used if the actual year-to-year solid waste acceptance rate is known.

$$M_{NMOC} = \sum_{i=1}^{n} 2\,k\,L_o M_i (e^{-kt_i})(C_{NMOC})(3.6\times10^{-9}) \quad \text{(Eq.}$$

Where:

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

k = Methane generation rate constant, $year^{-1}$.

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

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

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

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

3.6×10^{-9} = Conversion factor.

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

(ii)

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

$$M_{NMOC} = 2L_oR\ (e^{-kc} - e^{-kt})\ C_{NMOC}(3.6\times10^{-9})$$

Where:

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

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

R = Average annual acceptance rate, megagrams per year.

k = Methane generation rate constant, $year^{-1}$.

t = Age of landfill, years.

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

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

3.6×10^{-9} = Conversion factor.

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

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

(i) If the NMOC emission rate calculated in paragraph (a)(1) of this section is less than 34 megagrams per year, then the owner or operator must submit an NMOC emission rate report according to § 62.16724(c) and must recalculate the NMOC mass emission rate annually as required under § 62.16714(e).

(ii) If the NMOC emission rate calculated in paragraph (a)(1) of this section is equal to or greater than 34 megagrams per year, then the landfill owner or operator must either:

(A) Submit a gas collection and control system design plan within 1 year as specified in § 62.16724(d) and install and operate a gas collection and control system within 30 months according to § 62.16714(b) and (c);

(B) Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the Tier 2 procedures provided in paragraph (a)(3) of this section; or

(C) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the Tier 3 procedures provided in paragraph (a)(4) of this section.

(3) ***Tier 2.*** The landfill owner or operator must determine the site-specific NMOC concentration using the following sampling procedure. The landfill owner or operator must install at least two sample probes per hectare, evenly distributed over the landfill surface that has retained waste for at least 2 years. If the landfill is larger than 25 hectares in area, only 50 samples are required. The probes should be evenly distributed across the sample area. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator must collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using EPA Method 25 or 25C of appendix A-7 of 40 CFR part 60. Taking composite samples from different probes into a single cylinder is allowed; however, equal sample volumes must be taken from each probe. For each composite, the sampling rate, collection times, beginning and ending cylinder vacuums, or alternative volume measurements must be recorded to verify that composite volumes are equal. Composite sample volumes should not be less than one liter unless evidence can be provided to substantiate the accuracy of smaller volumes. Terminate compositing before the cylinder approaches ambient pressure where measurement accuracy diminishes. If more than the required number of samples is taken, all samples must be used in the analysis. The landfill owner or operator must divide the NMOC concentration from EPA Method 25 or 25C of appendix A-7 of 40 CFR part 60 by 6 to convert from C_{NMOC} as carbon to C_{NMOC} as hexane. If the landfill has an active or passive gas removal system in place, EPA 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 probes per hectare requirement. For active collection systems, samples may be collected from the common header pipe. The sample location on the common header pipe must be before any gas moving, condensate removal, or treatment system equipment. For active collection systems, a minimum of three samples must be collected from the header pipe.

(i) Within 60 days after the date of determining the NMOC concentration and corresponding NMOC emission rate, the owner or operator must submit the results according to § 62.16724(j)(2).

(ii) The landfill owner or operator must recalculate the NMOC mass emission rate using Equation 1 or Equation 2 provided in paragraph (a)(1)(i) or (ii) of this section using the average site-specific NMOC concentration from the collected samples instead of the default value provided in paragraph (a)(1) of this section.

(iii) If the resulting NMOC mass emission rate is less than 34 megagrams per year, then the owner or operator must submit a periodic estimate of NMOC emissions in an NMOC emission rate report according to § 62.16724(c) and must recalculate the NMOC mass

emission rate annually as required under § 62.16714(e). The site-specific NMOC concentration must be retested every 5 years using the methods specified in this section.

(iv) If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration is equal to or greater than 34 megagrams per year, the owner or operator must either:

(A) Submit a gas collection and control system design plan within 1 year as specified in § 62.16724(d) and install and operate a gas collection and control system within 30 months according to § 62.16714(b) and (c);

(B) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the site-specific methane generation rate using the Tier 3 procedures specified in paragraph (a)(4) of this section; or

(C) Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in paragraph (a)(6) of this section.

(4) ***Tier 3.*** The site-specific methane generation rate constant must be determined using the procedures provided in EPA Method 2E of appendix A-1 of 40 CFR part 60. The landfill owner or operator must estimate the NMOC mass emission rate using Equation 1 or Equation 2 in paragraph (a)(1)(i) or (ii) of this section and using a site-specific methane generation rate constant, and the site-specific NMOC concentration as determined in paragraph (a)(3) of this section instead of the default values provided in paragraph (a)(1) of this section. The landfill owner or operator must compare the resulting NMOC mass emission rate to the standard of 34 megagrams per year.

(i) If the NMOC mass emission rate as calculated using the Tier 2 site-specific NMOC concentration and Tier 3 site-specific methane generation rate is equal to or greater than 34 megagrams per year, the owner or operator must either:

(A) Submit a gas collection and control system design plan within 1 year as specified in § 62.16724(d) and install and operate a gas collection and control system within 30 months according to § 62.16714(b) and (c); or

(B) Conduct a surface emission monitoring demonstration using the Tier 4 procedures specified in paragraph (a)(6) of this section.

(ii) If the NMOC mass emission rate is less than 34 megagrams per year, then the owner or operator must recalculate the NMOC mass emission rate annually using Equation 1 or Equation 2 in paragraph (a)(1) of this section and using the site-specific Tier 2 NMOC concentration and Tier 3 methane generation rate constant and submit a periodic NMOC emission rate report as provided in § 62.16724(c). The calculation of the methane generation rate constant is performed only once, and the value obtained from this test must be used in all subsequent annual NMOC emission rate calculations.

(5) ***Alternative methods.*** The owner or operator may use other methods to determine the NMOC concentration or a site-specific methane generation rate constant as an alternative to the methods required in paragraphs (a)(3) and (4) of this section if the method has been approved by the Administrator.

(6) ***Tier 4.*** Demonstrate that surface methane emissions are below 500 parts per million. Surface emission monitoring must be conducted on a quarterly basis using the following procedures. Tier 4 is allowed only if the landfill owner or operator can demonstrate that NMOC emissions are greater than or equal to 34 megagrams per year but less than 50 megagrams per year using Tier 1 or Tier 2. If both Tier 1 and Tier 2 indicate NMOC emissions are megagrams per year or greater, then Tier 4 cannot be used. In addition, the landfill must meet the criteria in paragraph (a)(6)(viii) of this section.

(i) Measure surface concentrations of methane along the entire perimeter of the landfill and along a pattern that traverses the landfill at no more than 30-meter intervals using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in § 62.16720(d).

(ii) The background concentration must be determined by moving the probe inlet upwind and downwind at least 30 meters from the waste mass boundary of the landfill.

(iii) Surface emission monitoring must be performed in accordance with section 8.3.1 of EPA Method 21 of appendix A-7 of 40 CFR part 60, except that the probe inlet must be placed no more than 5 centimeters above the landfill surface; the constant measurement of distance above the surface should be based on a mechanical device such as with a wheel on a pole.

(A) The owner or operator must use a wind barrier, similar to a funnel, when onsite average wind speed exceeds 4 miles per hour or 2 meters per second or gust exceeding 10 miles per hour. Average on-site wind speed must also be determined in an open area at 5-minute intervals using an on-site anemometer with a continuous recorder and data logger for the entire duration of the monitoring event. The wind barrier must surround the SEM monitor, and must be placed on the ground, to ensure wind turbulence is blocked. The SEM cannot be conducted if average wind speed exceeds 25 miles per hour.

(B) Landfill surface areas where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover, and all cover penetrations must also be monitored using a device meeting the specifications provided in § 62.16720(d).

(iv) Each owner or operator seeking to comply with the Tier 4 provisions in paragraph (a)(6) of this section must maintain records of surface emission monitoring as provided in § 62.16726(g) and submit a Tier 4 surface emissions report as provided in § 62.16724(d)(4)(iii).

(v) If there is any measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator must submit a gas collection and control system design plan within 1 year of the first measured concentration of methane of 500 parts per million or greater from the surface of the landfill according to § 62.16724(d) and install and operate a gas collection and control system according to § 62.16714(b) and (c) within 30 months of the most recent NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year based on Tier 2.

(vi) If after four consecutive quarterly monitoring periods at a landfill, other than a closed landfill, there is no measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator must continue quarterly surface emission monitoring using the methods specified in this section.

(vii) If after four consecutive quarterly monitoring periods at a closed landfill there is no measured concentration of methane of 500 parts per million or greater from the surface of the landfill, the owner or operator must conduct annual surface emission monitoring using the methods specified in this section.

(viii) If a landfill has installed and operates a collection and control system that is not required by this subpart, then the collection and control system must meet the following criteria:

(A) The gas collection and control system must have operated for at least 6,570 out of 8,760 hours preceding the Tier 4 SEM demonstration.

(B) During the Tier 4 SEM demonstration, the gas collection and control system must operate as it normally would to collect and control as much landfill gas as possible.

(b) After the installation and startup of a collection and control system in compliance with this subpart, the owner or operator must calculate the NMOC emission rate for purposes of determining when the system can be capped, removed, or decommissioned as provided in § 62.16714(f), using Equation 3:

(1) ***Flow rate.*** The flow rate of landfill gas, $Q_{LFG,}$ must be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control system using a gas flow measuring device calibrated according to the provisions of section 10 of EPA Method 2E of appendix A-1 of 40 CFR part 60.

(2) ***NMOC concentration.*** The average NMOC concentration, $C_{NMOC,}$ must be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in EPA Method 25 or EPA Method 25C of appendix A-7 of 40 CFR part 60. The sample location on the common header pipe must be before any condensate removal or other gas refining units. The landfill owner or operator must divide the NMOC concentration from EPA Method 25 or EPA Method 25C of appendix A-7 of 40 CFR part 60 by six to convert from C_{NMOC} as carbon to C_{NMOC} as hexane.

(3) ***Gas flow rate method.*** The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the Administrator.

(i) Within 60 days after the date of calculating the NMOC emission rate for purposes of determining when the system can be capped or removed, the owner or operator must submit the results according to § 62.16724(j)(2).

(ii) [Reserved]

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

Where:

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

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

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

(c) When calculating emissions for Prevention of Significant Deterioration purposes, the owner or operator of each MSW landfill subject to the provisions of this subpart must estimate the NMOC emission rate for comparison to the Prevention of Significant Deterioration major source and significance levels in §§ 51.166 or 52.21 of this chapter using Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources (AP-42) or other approved measurement procedures.

(d) For the performance test required in § 62.16714(c)(1), the net heating value of the combusted landfill gas as determined in 40 CFR 60.18(f)(3) of this chapter is calculated from the concentration of methane in the landfill gas as measured by EPA Method 3C. A minimum of three 30-minute EPA Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. EPA Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under 40 CFR 60.18(f)(4) of this chapter.

(1) ***Performance test results.*** Within 60 days after the date of completing each performance test (as defined in § 60.8 of this chapter), the owner or operator must submit the results of the performance tests required by paragraph (b) or (d) of this section, including any associated fuel analyses, according to § 62.16724(j)(1).

(2) [Reserved]

(e) For the performance test required in § 62.16714(c)(2), EPA Method 25 or 25C (EPA Method 25C may be used at the inlet only) of appendix A-7 of 40 CFR part 60 must be used to determine compliance with the 98 weight-percent efficiency or the 20 parts-per-million by

volume outlet NMOC concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by § 62.16724(d)(2). EPA Method 3, 3A, or 3C of appendix A-2 of 40 CFR part 60 must be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 parts-per-million NMOC as carbon (8 parts-per-million NMOC as hexane), EPA Method 25A should be used in place of EPA Method 25. EPA Method 18 of appendix A-6 of 40 CFR part 60 may be used in conjunction with EPA Method 25A on a limited basis (compound specific, *e.g.*, methane) or EPA Method 3C may be used to determine methane. The methane as carbon should be subtracted from the EPA Method 25A total hydrocarbon value as carbon to give NMOC concentration as carbon. The landfill owner or operator must divide the NMOC concentration as carbon by 6 to convert the C_{NMOC} as carbon to C_{NMOC} as hexane. Equation 4 must be used to calculate efficiency:

(1) ***Performance test submission.*** Within 60 days after the date of completing each performance test (as defined in§ 60.8 of this chapter), the owner or operator must submit the results of the performance tests, including any associated fuel analyses, according to § 62.16724(j)(1).

(2) [Reserved]

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

Where:

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

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

§ 62.16720 Compliance provisions.

Follow the compliance provisions in this section (as well as the provisions in §§ 62.16716 and 62.16722), or the compliance provisions in § 63.1960 of this chapter (as well as the provisions in §§ 63.1958 and 63.1961 of this chapter), or both as alternative means of compliance, for an MSW landfill with a gas collection and control system used to comply with the provisions of § 62.16714(b) and (c). Once the owner or operator begins to comply with the provisions of § 63.1960 of this chapter, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of this section.

(a) Except as provided in § 62.16724(d)(2), the specified methods in paragraphs (a)(1) through (6) of this section must be used to determine whether the gas collection system is in compliance with § 62.16714(b)(2).

(1) For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with § 62.16714(b)(2)(i), either Equation 5 or Equation 6 must be used. The methane generation rate constant (k) and methane generation potential

(Lo) kinetic factors should be those published in the most recent AP-42 or other site-specific values demonstrated to be appropriate and approved by the Administrator. If k has been determined as specified in § 62.16718(a)(4), the value of k determined from the test must be used. A value of no more than 15 years must be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.

(i) For sites with unknown year-to-year solid waste acceptance rate:

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

Where:

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

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

R = Average annual acceptance rate, megagrams per year.

k = Methane generation rate constant, year−1.

t = Age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure, t is the age of the landfill at installation, years.

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

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

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

Where:

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

k = Methane generation rate constant, year−1.

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

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

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

(iii) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, Equation 5 or Equation 6 in paragraphs (a)(1)(i) and (ii) of this section. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using Equation 5 or Equation 6 in paragraphs (a)(1)(i) or (ii) of this section or other methods must be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

(2) For the purposes of determining sufficient density of gas collectors for compliance with § 62.16714(b)(2)(ii), the owner or operator must design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the Administrator, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.

(3) For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with § 62.16714(b)(2)(iii), the owner or operator must measure gauge pressure in the gas collection header applied to each individual well monthly. If a positive pressure exists, action must be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under § 62.16716(b). Any attempted corrective measure must not cause exceedances of other operational or performance standards.

(i) If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement of positive pressure, the owner or operator must conduct a root cause analysis and correct the exceedance as soon as practicable, but not later than 60 days after positive pressure was first measured. The owner or operator must keep records according to § 62.16726(e)(3).

(ii) If corrective actions cannot be fully implemented within 60 days following the positive pressure or elevated temperature measurement for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit) or positive pressure. The owner or operator must submit the items listed in § 62.16724(h)(7) as part of the next annual report. The owner or operator must keep records according to § 62.16726(e)(4).

(iii) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to § 62.16724(h)(7) and (k). The owner or operator must keep records according to § 62.16726(e)(5).

(4) For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator must monitor each well monthly for temperature as provided in § 62.16716(c). If a well exceeds the operating parameter for temperature, action must be

initiated to correct the exceedance within 5 calendar days. Any attempted corrective measure must not cause exceedances of other operational or performance standards.

(i) If a landfill gas temperature less than 55 degrees Celsius (131 degrees Fahrenheit) cannot be achieved within 15 calendar days of the first measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit), the owner or operator must conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after a landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit) was first measured. The owner or operator must keep records according to § 62.16726(e)(3).

(ii) If corrective actions cannot be fully implemented within 60 days following the measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit) for which the root cause analysis was required, the owner or operator must also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the measurement of landfill gas temperature greater than 55 degrees Celsius (131 degrees Fahrenheit). The owner or operator must submit the items listed in § 62.16724(h)(7) as part of the next annual report. The owner or operator must keep records according to § 62.16726(e)(4).

(iii) If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the owner or operator must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator, according to § 62.16724(h)(7) and § 62.16724(k). The owner or operator must keep records according to § 62.16726(e)(5).

(5) An owner or operator seeking to demonstrate compliance with § 62.16714(b)(2)(iv) through the use of a collection system not conforming to the specifications provided in § 62.16728 must provide information satisfactory to the Administrator as specified in § 62.16724(d)(3) demonstrating that off-site migration is being controlled.

(b) For purposes of compliance with § 62.16716(a), each owner or operator of a controlled landfill must place each well or design component as specified in the approved design plan as provided in § 62.16724(d). Each well must be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:

(1) 5 years or more if active; or

(2) 2 years or more if closed or at final grade.

(c) The following procedures must be used for compliance with the surface methane operational standard as provided in § 62.16716(d):

(1) After installation and startup of the gas collection system, the owner or operator must monitor surface concentrations of methane along the entire perimeter of the collection area

and along a pattern that traverses the landfill at no more than 30-meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of this section.

(2) The background concentration must be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.

(3) Surface emission monitoring must be performed in accordance with section 8.3.1 of EPA Method 21 of appendix A-7 of 40 CFR part 60, except that the probe inlet must be placed within 5 to 10 centimeters of the ground. Monitoring must be performed during typical meteorological conditions.

(4) Any reading of 500 parts per million or more above background at any location must be recorded as a monitored exceedance and the actions specified in paragraphs (c)(4)(i) through (v) of this section must be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of § 62.16716(d).

(i) The location of each monitored exceedance must be marked, and the location and concentration recorded. For location, you must determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.

(ii) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance must be made and the location must be re-monitored within 10 calendar days of detecting the exceedance.

(iii) If the re-monitoring of the location shows a second exceedance, additional corrective action must be taken, and the location must be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in paragraph (c)(4)(v) of this section must be taken, and no further monitoring of that location is required until the action specified in paragraph (c)(4)(v) of this section has been taken.

(iv) Any location that initially showed an exceedance but has a methane concentration less than 500 parts-per-million methane above background at the 10-day re-monitoring specified in paragraph (c)(4)(ii) or (iii) of this section must be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts-per-million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in paragraph (c)(4)(iii) or (v) of this section must be taken.

(v) For any location where monitored methane concentration equals or exceeds 500 parts-per-million above background three times within a quarterly period, a new well or other collection device must be installed within 120 calendar days of the initial exceedance. An

alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the Administrator for approval.

(5) The owner or operator must implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

(d) Each owner or operator seeking to comply with the provisions in paragraph (c) of this section or § 62.16718(a)(6) must comply with the following instrumentation specifications and procedures for surface emission monitoring devices:

(1) The portable analyzer must meet the instrument specifications provided in section 6 of EPA Method 21 of appendix A-7 of 40 CFR part 60, except that "methane" replaces all references to "VOC."

(2) The calibration gas must be methane, diluted to a nominal concentration of 500 parts-per-million in air.

(3) To meet the performance evaluation requirements in section 8.1 of EPA Method 21 of appendix A-7 of 40 CFR part 60, the instrument evaluation procedures of section 8.1 of EPA Method 21 of appendix A-7 of 40 CFR part 60 must be used.

(4) The calibration procedures provided in sections 8 and 10 of EPA Method 21 of appendix A-7 of 40 CFR part 60 must be followed immediately before commencing a surface monitoring survey.

(e) The provisions of this subpart apply at all times, including periods of startup, shutdown, or malfunction. During periods of startup, shutdown, and malfunction, you must comply with the work practice specified in § 62.16716(e) in lieu of the compliance provisions in § 62.16720.

§ 62.16722 Monitoring of operations.

Follow the monitoring provisions in this section (as well as the provisions in §§ 62.16716 and 62.16720), except as provided in § 62.16724(d)(2), or the monitoring provisions in § 63.1961 of this chapter (as well as the provisions in §§ 63.1958 and 63.1960 of this chapter), or both as alternative means of compliance, for an MSW landfill with a gas collection and control system used to comply with the provisions of § 62.16714(b) and (c). Once the owner or operator begins to comply with the provisions of § 63.1961 of this chapter, the owner or operator must continue to operate the collection and control device according to those provisions and cannot return to the provisions of this section.

(a) Each owner or operator seeking to comply with § 62.16714(b)(2) for an active gas collection system must install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:

(1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in § 62.16720(a)(3); and

(2) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as follows:

(i) The nitrogen level must be determined using EPA Method 3C of appendix A-2 of 40 CFR part 60, unless an alternative test method is established as allowed by § 62.16724(d)(2).

(ii) Unless an alternative test method is established as allowed by § 62.16724(d)(2), the oxygen level must be determined by an oxygen meter using EPA Method 3A of appendix A-7 of 40 CFR part 60, EPA Method 3C of appendix A-7 of 40 CFR part 60, or ASTM D6522-11. Determine the oxygen level by an oxygen meter using EPA Method 3A, 3C, or ASTM D6522-11 (if sample location is prior to combustion) except that:

(A) The span must be set between 10- and 12-percent oxygen;

(B) A data recorder is not required;

(C) Only two calibration gases are required, a zero and span;

(D) A calibration error check is not required;

(E) The allowable sample bias, zero drift, and calibration drift are ±10 percent.

(iii) A portable gas composition analyzer may be used to monitor the oxygen levels provided:

(A) The analyzer is calibrated; and

(B) The analyzer meets all quality assurance and quality control requirements for EPA Method 3A or ASTM D6522-11.

(3) Monitor temperature of the landfill gas on a monthly basis as provided in § 62.16720(a)(4). The temperature measuring device must be calibrated annually using the procedure in 40 CFR part 60, appendix A-1, EPA Method 2, section 10.3.

(b) Each owner or operator seeking to comply with § 62.16714(c) using an enclosed combustor must calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:

(1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not

required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.

(2) A device that records flow to the control device and bypass of the control device (if applicable). The owner or operator must:

(i) Install, calibrate, and maintain a gas flow rate measuring device that must record the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(c) Each owner or operator seeking to comply with § 62.16714(c) using a non-enclosed flare must install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

(1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame.

(2) A device that records flow to the flare and bypass of the flare (if applicable). The owner or operator must:

(i) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the control device at least every 15 minutes; and

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(d) Each owner or operator seeking to demonstrate compliance with § 62.16714(c) using a device other than a non-enclosed flare or an enclosed combustor or a treatment system must provide information satisfactory to the Administrator as provided in § 62.16724(d)(2) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Administrator must review the information and either approve it, or request that additional information be submitted. The Administrator may specify additional appropriate monitoring procedures.

(e) Each owner or operator seeking to install a collection system that does not meet the specifications in § 62.16728 or seeking to monitor alternative parameters to those required by § 62.16716 through § 62.16722 must provide information satisfactory to the Administrator as provided in § 62.16724(d)(2) and (3) describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate

monitoring procedures. The Administrator may specify additional appropriate monitoring procedures.

(f) Each owner or operator seeking to demonstrate compliance with the 500 parts-per-million surface methane operational standard in § 62.16716(d) must monitor surface concentrations of methane according to the procedures provided in § 62.16720(c) and the instrument specifications in § 62.16720(d). Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 parts-per-million or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

(g) Each owner or operator seeking to demonstrate compliance with the control system requirements in § 62.16714(c) using a landfill gas treatment system must maintain and operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan required in § 62.16726(b)(5)(ii) and must calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to the treatment system and bypass of the treatment system (if applicable). The owner or operator must:

(1) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and

(2) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(h) The monitoring requirements of paragraphs (b), (c), (d), and (g) of this section apply at all times the designated facility is operating, except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. You are required to complete monitoring system repairs in response to monitoring system malfunctions and to return the monitoring system to operation as expeditiously as practicable.

(i) Incorporation by reference required material.

(1) The material required by this section was approved for incorporation by reference into this section by the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. You may inspect approved material at the EPA Docket Center, WJC West Building, Room Number 3334, 1301 Constitution Ave. NW, Washington, DC, (202) 566-1744, Docket ID No. EPA-HQ-OAR-2019-0338 and obtain it from the source(s) listed below. It is also available for inspection at the National Archives and Records Administration (NARA). For

information on the availability of this material at NARA, email *fedreg.legal@nara.gov*, or go to *www.archives.gov/federal-register/cfr/ibr-locations.html*.

(2) ASTM International, 100 Barr Harbor Drive, P.O. Box CB700, West Conshohocken, Pennsylvania 19428-2959, (800) 262-1373, *www.astm.org*.

(i) ASTM D6522-11 Standard Test Method for Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers, and Process Heaters Using Portable Analyzers, approved December 1, 2011.

(ii) [Reserved]

§ 62.16724 Reporting guidelines.

Follow the reporting provisions listed in this section, as applicable, except as provided under 40 CFR 60.24 and §§ 62.16711(g), (h), and 62.16724(d)(2).

(a) ***Design capacity report.*** Submit the initial design capacity report no later than September 20, 2021. The initial design capacity report must contain the following information:

(1) A map or plot of the landfill, providing the size and location of the landfill, and identifying all areas where solid waste may be landfilled according to the permit issued by the state, local, or tribal agency responsible for regulating the landfill.

(2) The maximum design capacity of the landfill. Where the maximum design capacity is specified in the permit issued by the state, local, or tribal agency responsible for regulating the landfill, a copy of the permit specifying the maximum design capacity may be submitted as part of the report. If the maximum design capacity of the landfill is not specified in the permit, the maximum design capacity must be calculated using good engineering practices. The calculations must be provided, along with the relevant parameters as part of the report. The landfill may calculate design capacity in either megagrams or cubic meters for comparison with the exemption values. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation must include a site-specific density, which must be recalculated annually. Any density conversions must be documented and submitted with the design capacity report. The state, local, or tribal agency or the Administrator may request other reasonable information as may be necessary to verify the maximum design capacity of the landfill.

(b) ***Amended design capacity report.*** An amended design capacity report must be submitted providing notification of an increase in the design capacity of the landfill, within 90 days of an increase in the maximum design capacity of the landfill to meet or exceed 2.5 million megagrams and 2.5 million cubic meters. This increase in design capacity may result from an increase in the permitted volume of the landfill or an increase in the density as documented in the annual recalculation required in § 62.16726(f).

(c) ***NMOC emission rate report.*** For existing MSW landfills covered by this subpart with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, the NMOC emission rate report must be submitted following the procedure specified in paragraph (j)(2) of this section no later than 90 days after the effective date of this subpart. The NMOC emission rate report must be submitted to the Administrator annually following the procedure specified in paragraph (j)(2) of this section, except as provided for in paragraph (c)(3) of this section. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate.

(1) The NMOC emission rate report must contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in § 62.16718(a) or (b), as applicable.

(2) The NMOC emission rate report must include all the data, calculations, sample reports and measurements used to estimate the annual or 5-year emissions.

(3) If the estimated NMOC emission rate as reported in the annual report to the Administrator is less than 34 megagrams per year in each of the next 5 consecutive years, the owner or operator may elect to submit, following the procedure specified in paragraph (j)(2) of this section, an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate must include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based must be provided to the Administrator. This estimate must be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised 5-year estimate must be submitted to the Administrator. The revised estimate must cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

(4) Each owner or operator subject to the requirements of this subpart is exempted from the requirements to submit an NMOC emission rate report, after installing a collection and control system that complies with § 62.16714(b) and (c), during such time as the collection and control system is in operation and in compliance with §§ 62.16716 and 62.16720.

(d) ***Collection and control system design plan.*** The collection and control system design plan must be prepared and approved by a professional engineer and must meet the following requirements:

(1) The collection and control system as described in the design plan must meet the design requirements in § 62.16714(b) and (c).

(2) The collection and control system design plan must include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping, or reporting provisions of §§ 62.16716 through 62.16726 proposed by the owner or operator.

(3) The collection and control system design plan must either conform to specifications for active collection systems in § 62.16728 or include a demonstration to the Administrator's satisfaction of the sufficiency of the alternative provisions to § 62.16728.

(4) Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters must submit a copy of the collection and control system design plan cover page that contains the engineer's seal to the Administrator within 1 year of the first NMOC emission rate report in which the NMOC emission rate equals or exceeds 34 megagrams per year, except as follows:

(i) If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in § 62.16718(a)(3) and the resulting rate is less than 34 megagrams per year, annual periodic reporting must be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated NMOC emission rate is equal to or greater than 34 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated NMOC emission rate based on NMOC sampling and analysis, must be submitted, following the procedures in paragraph (j)(2) of this section, within 180 days of the first calculated exceedance of 34 megagrams per year.

(ii) If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant k, as provided in Tier 3 in § 62.16718(a)(4), and the resulting NMOC emission rate is less than 34 megagrams per year, annual periodic reporting must be resumed. The resulting site-specific methane generation rate constant k must be used in the NMOC emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of § 62.16718(a)(4) and the resulting site-specific methane generation rate constant k must be submitted, following the procedure specified in paragraph (j)(2) of this section, to the Administrator within 1 year of the first calculated NMOC emission rate equaling or exceeding 34 megagrams per year.

(iii) If the owner or operator elects to demonstrate that site-specific surface methane emissions are below 500 parts-per-million methane, based on the provisions of § 62.16718(a)(6), then the owner or operator must submit annually a Tier 4 surface emissions report as specified in this paragraph following the procedure specified in paragraph (j)(2) of this section until a surface emissions reading of 500 parts-per-million methane or greater is found. If the Tier 4 surface emissions report shows no surface emissions readings of 500 parts-per-million methane or greater for four consecutive quarters at a closed landfill, then the landfill owner or operator may reduce Tier 4 monitoring from a quarterly to an annual frequency. The Administrator may request such additional information as may be necessary to verify the reported instantaneous surface emission readings. The Tier 4 surface emissions report must clearly identify the location, date and time (to the nearest second), average wind speeds including wind gusts, and reading (in parts-per-million) of any value 500 parts-per-million methane or greater, other than non-repeatable, momentary readings. For location, you must determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places. The Tier 4 surface emission report should also include the results

of the most recent Tier 1 and Tier 2 results in order to verify that the landfill does not exceed 50 megagrams per year of NMOC.

(A) The initial Tier 4 surface emissions report must be submitted annually, starting within 30 days of completing the fourth quarter of Tier 4 SEM that demonstrates that site-specific surface methane emissions are below 500 parts-per-million methane, and following the procedure specified in paragraph (j)(2) of this section

(B) The Tier 4 surface emissions rate report must be submitted within 1 year of the first measured surface exceedance of 500 parts-per-million methane, following the procedure specified in paragraph (j)(2) of this section.

(iv) If the landfill is in the closed landfill subcategory, the owner or operator is exempt from submitting a collection and control system design plan to the Administrator provided that conditions in § 62.16711(g)(3) are met. If not, the owner or operator shall follow the submission procedures and timing in § 62.16724(d)(ii) and (iii) using a level of 50 Mg/yr instead of 34 Mg/yr.

(5) The landfill owner or operator must notify the Administrator that the design plan is completed and submit a copy of the plan's signature page. The Administrator has 90 days to decide whether the design plan should be submitted for review. If the Administrator chooses to review the plan, the approval process continues as described in paragraph (c)(6) of this section. However, if the Administrator indicates that submission is not required or does not respond within 90 days, the landfill owner or operator can continue to implement the plan with the recognition that the owner or operator is proceeding at their own risk. In the event that the design plan is required to be modified to obtain approval, the owner or operator must take any steps necessary to conform any prior actions to the approved design plan and any failure to do so could result in an enforcement action.

(6) Upon receipt of an initial or revised design plan, the Administrator must review the information submitted under paragraphs (d)(1) through (3) of this section and either approve it, disapprove it, or request that additional information be submitted. Because of the many site-specific factors involved with landfill gas system design, alternative systems may be necessary. A wide variety of system designs are possible, such as vertical wells, combination horizontal and vertical collection systems, or horizontal trenches only, leachate collection components, and passive systems. If the Administrator does not approve or disapprove the design plan, or does not request that additional information be submitted within 90 days of receipt, then the owner or operator may continue with implementation of the design plan, recognizing they would be proceeding at their own risk.

(7) If the owner or operator chooses to demonstrate compliance with the emission control requirements of this subpart using a treatment system as defined in this subpart, then the owner or operator must prepare a site-specific treatment system monitoring plan as specified in § 62.16726(b)(5). Legacy controlled landfills must prepare the monitoring plan no later than May 23, 2022.

(e) ***Revised design plan.*** The owner or operator who has already been required to submit a design plan under paragraph (d) of this section, or under subpart GGG of this part; 40 CFR part 60, subpart WWW; or a state plan implementing subpart Cc of 40 CFR part 60, must submit a revised design plan to the Administrator for approval as follows:

(1) At least 90 days before expanding operations to an area not covered by the previously approved design plan.

(2) Prior to installing or expanding the gas collection system in a way that is not consistent with the design plan that was submitted to the Administrator according to paragraph (d) of this section.

(f) ***Closure report.*** Each owner or operator of a controlled landfill must submit a closure report to the Administrator within 30 days of ceasing waste acceptance. The Administrator may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the Administrator, no additional wastes may be placed into the landfill without filing a notification of modification as described under 40 CFR 60.7(a)(4).

(g) ***Equipment removal report.*** Each owner or operator of a controlled landfill must submit an equipment removal report to the Administrator 30 days prior to removal or cessation of operation of the control equipment.

(1) The equipment removal report must contain the following items:

(i) A copy of the closure report submitted in accordance with paragraph (f) of this section; and

(ii) A copy of the initial performance test report demonstrating that the 15-year minimum control period has expired, unless the report of the results of the performance test has been submitted to the EPA via the EPA's Central Data Exchange (CDX), or information that demonstrates that the gas collection and control system will be unable to operate for 15 years due to declining gas flows. In the equipment removal report, the process unit(s) tested, the pollutant(s) tested, and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX; and

(iii) Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 34 megagrams or greater of NMOC per year, unless the NMOC emission rate reports have been submitted to the EPA via the EPA's CDX. If the NMOC emission rate reports have been previously submitted to the EPA's CDX, a statement that the NMOC emission rate reports have been submitted electronically and the dates that the reports were submitted to the EPA's CDX may be submitted in the equipment removal report in lieu of the NMOC emission rate reports; or

(iv) For the closed landfill subcategory, dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year, unless the NMOC emission rate reports have been submitted to the EPA via the EPA's CDX. If the NMOC emission rate reports have been previously submitted to the EPA's CDX, a statement that the NMOC emission rate reports have been submitted electronically and the dates that the reports were submitted to the EPA's CDX may be submitted in the equipment removal report in lieu of the NMOC emission rate reports.

(2) The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in § 62.16714(f) have been met.

(h) ***Annual report.*** The owner or operator of a landfill seeking to comply with § 62.16714(e)(2) using an active collection system designed in accordance with § 62.16714(b) must submit to the Administrator, following the procedures specified in paragraph (j)(2) of this section, an annual report of the recorded information in paragraphs (h)(1) through (7) of this section. The initial annual report must be submitted within 180 days of installation and startup of the collection and control system except for legacy controlled landfills that have already submitted an initial report under 40 CFR part 60, subpart WWW; subpart GGG of this part; or a state plan implementing 40 CFR part 60, subpart Cc. Except for legacy controlled landfills, the initial annual report must include the initial performance test report required under 40 CFR 60.8, as applicable, unless the report of the results of the performance test has been submitted to the EPA via the EPA's CDX. Legacy controlled landfills are exempted from submitting performance test reports in EPA's CDX provided that those reports were submitted under 40 CFR part 60, subpart WWW; subpart GGG of this part; or a state plan implementing 40 CFR part 60, subpart Cc. In the initial annual report, the process unit(s) tested, the pollutant(s) tested and the date that such performance test was conducted may be submitted in lieu of the performance test report if the report has been previously submitted to the EPA's CDX. The initial performance test report must be submitted, following the procedure specified in paragraph (j)(1) of this section, no later than the date that the initial annual report is submitted. For enclosed combustion devices and flares, reportable exceedances are defined under § 62.16726(c)(1). Legacy controlled landfills are required to submit the annual report no later than one year after the most recent annual report submitted. If complying with the operational provisions of §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed at §§ 62.16716, 62.16720, and 62.16722, the owner or operator must follow the semi-annual reporting requirements in § 63.1981(h) of this chapter in lieu of this paragraph.

(1) Value and length of time for exceedance of applicable parameters monitored under § 62.16722(a)(1), (b), (c), (d), and (g).

(2) Description and duration of all periods when the gas stream was diverted from the control device or treatment system through a bypass line or the indication of bypass flow as specified under § 62.16722.

(3) Description and duration of all periods when the control device or treatment system was not operating and length of time the control device or treatment system was not operating.

(4) All periods when the collection system was not operating.

(5) The location of each exceedance of the 500 parts-per-million methane concentration as provided in § 62.16716(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month. For location, you must determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.

(6) The date of installation and the location of each well or collection system expansion added pursuant to § 62.16720(a)(3), (4), (b), and (c)(4).

(7) For any corrective action analysis for which corrective actions are required in § 62.16720(a)(3) or (4) and that take more than 60 days to correct the exceedance, the root cause analysis conducted, including a description of the recommended corrective action(s), the date for corrective action(s) already completed following the positive pressure or elevated temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

(i) ***Initial performance test report.*** Each owner or operator seeking to comply with § 62.16714(c) must include the following information with the initial performance test report required under 40 CFR 60.8 of this chapter:

(1) A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;

(2) The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;

(3) The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;

(4) The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area;

(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.

(j) ***Electronic reporting.*** The owner or operator must submit reports electronically according to paragraphs (j)(1) and (2) of this section.

(1) Within 60 days after the date of completing each performance test (as defined in 40 CFR 60.8 of this chapter), the owner or operator must submit the results of each performance test according to the following procedures:

(i) For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT website (*https://www3.epa.gov/ttn/chief/ert/ert_info.html*) at the time of the test, you must submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI). The CEDRI can be accessed through the EPA's CDX (*https://cdx.epa.gov/*). Performance test data must be submitted in a file format generated through the use of the EPA's ERT or an alternative file format consistent with the extensible markup language (XML) schema listed on the EPA's ERT website, once the XML schema is available. If you claim that some of the performance test information being submitted is confidential business information (CBI), you must submit a complete file generated through the use of the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website, including information claimed to be CBI, on a compact disc, flash drive, or other commonly used electronic storage media to the EPA. The electronic media must be clearly marked as CBI and mailed to U.S. EPA/OAQPS/CORE CBI Office, Attention: Group Leader, Measurement Policy Group, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same ERT or alternate file with the CBI omitted must be submitted to the EPA via the EPA's CDX as described earlier in this paragraph.

(ii) For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT website at the time of the test, you must submit the results of the performance test to the Administrator at the appropriate address listed in 40 CFR 60.4 of this chapter.

(2) Each owner or operator required to submit reports following the procedure specified in this paragraph must submit reports to the EPA via the CEDRI (CEDRI can be accessed through the EPA's CDX). The owner or operator must use the appropriate electronic report in CEDRI for this subpart or an alternate electronic file format consistent with the XML schema listed on the CEDRI website (*https://www3.epa.gov/ttn/chief/cedri/index.html*). If the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the owner or operator must submit the report to the Administrator at the appropriate address listed in 40 CFR 60.4 of this chapter. Once the form has been available in CEDRI for 90 calendar days, the owner or operator must begin submitting all subsequent reports via CEDRI. The reports must be submitted by the deadlines specified in this subpart, regardless of the method in which the reports are submitted.

(k) ***Corrective action and the corresponding timeline.*** The owner or operator must submit according to paragraphs (k)(1) and (2) of this section. If complying with the operational provisions of 40 CFR 63.1958, 63.1960, and 63.1961 of this chapter, as allowed at §§ 62.16716, 62.16720, and 62.16722, the owner or operator must follow the corrective action and the corresponding timeline reporting requirements in § 63.1981(j) of this chapter in lieu of paragraphs (k)(1) and (2) of this section.

(1) For corrective action that is required according to § 62.16720(a)(3)(iii) or 62.16720(a)(4)(iii) and is expected to take longer than 120 days after the initial exceedance to complete, you must submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the Administrator as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit) or above. The Administrator must approve the plan for corrective action and the corresponding timeline.

(2) For corrective action that is required according to § 62.16720(a)(3)(iii) or § 62.16720(a)(4)(iii) and is not completed within 60 days after the initial exceedance, you must submit a notification to the Administrator as soon as practicable but no later than 75 days after the first measurement of positive pressure or temperature exceedance.

(l) ***Liquids addition.*** The owner or operator of a designated facility with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters that has employed leachate recirculation or added liquids based on a Research, Development, and Demonstration permit (issued through Resource Conservation and Recovery Act (RCRA), subtitle D, part 258) within the last 10 years must submit to the Administrator, annually, following the procedure specified in paragraph (j)(2) of this section, the following information:

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

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

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

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

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

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

(7) The initial report must contain items in paragraph (l)(1) through (6) of this section per year for the most recent 365 days as well as for each of the previous 10 years, to the extent historical data are available in on-site records, and the report must be submitted no later than June 21, 2022.

(8) Subsequent annual reports must contain items in paragraph (l)(1) through (6) of this section for the 365-day period following the 365-day period included in the previous annual

report, and the report must be submitted no later than 365 days after the date the previous report was submitted.

(9) Landfills in the closed landfill subcategory are exempt from reporting requirements contained in paragraphs (l)(1) through (7) of this section.

(10) Landfills may cease annual reporting of items in paragraphs (l)(1) through (6) of this section once they have submitted the closure report in § 62.16724(f).

(m) ***Tier 4 notification.***

(1) The owner or operator of a designated facility with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters must provide a notification of the date(s) upon which it intends to demonstrate site-specific surface methane emissions are below 500 parts-per-million methane, based on the Tier 4 provisions of § 62.16718(a)(6). The landfill must also include a description of the wind barrier to be used during the SEM in the notification. Notification must be postmarked not less than 30 days prior to such date.

(2) If there is a delay to the scheduled Tier 4 SEM date due to weather conditions, including not meeting the wind requirements in § 62.16718(a)(6)(A), the owner or operator of a landfill shall notify the Administrator by email or telephone no later than 48 hours before any known delay in the original test date, and arrange an updated date with the Administrator by mutual agreement.

(n) ***Notification of meeting Tier 4.*** The owner or operator of a designated facility must submit a notification to the EPA Regional office within 10 business days of completing each increment of progress. Each notification must indicate which increment of progress specified in § 62.16712 has been achieved. The notification must be signed by the owner or operator of the landfill.

(1) For the first increment of progress (submit control plan), you must follow paragraph (p) of this section in addition to submitting the notification described in paragraph (n) of this section. A copy of the design plan must also be kept on site at the landfill.

(2) For the second increment of progress, a signed copy of the contract(s) awarded must be submitted in addition to the notification described in paragraph (n) of this section.

(o) ***Notification of failing to meet an increment of progress.*** The owner or operator of a designated facility who fails to meet any increment of progress specified in § 62.16712(a)(1) through (5) according to the applicable schedule in § 62.16712 must submit notification that the owner or operator failed to meet the increment to the EPA Regional office within 10 business days of the applicable date in § 62.16712.

(p) ***Alternate dates for increments 2 and 3.*** The owner or operator (or the state or tribal air pollution control authority) that is submitting alternative dates for increments 2 and 3 according to § 62.16712(d) must do so by the date specified for submitting the final control

plan. The date for submitting the final control plan is specified in § 62.16712(c), as applicable. The owner or operator (or the state or tribal air pollution control authority) must submit a justification if any of the alternative dates are later than the increment dates in table 1 of this subpart. In addition to submitting the alternative dates to the appropriate EPA Regional office, the owner or operator must also submit the alternative dates to the state or tribe.

(q) ***24-hour high temperature report.*** Each owner or operator that chooses to comply with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed in §§ 62.16716, 62.16720, and 62.16722, must submit the 24-hour high temperature report according to § 63.1981(k) of this chapter.

§ 62.16726 Recordkeeping guidelines.

Follow the recordkeeping provisions in this section.

(a) Except as provided in § 62.16724(d)(2), each owner or operator of an MSW landfill subject to the provisions of § 62.16714(e) must keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report that triggered § 62.16714(e), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(b) Except as provided in § 62.16724(d)(2), each owner or operator of a controlled landfill must keep up-to-date, readily accessible records for the life of the control system equipment of the data listed in paragraphs (b)(1) through (5) of this section as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring must be maintained for a minimum of 5 years. Records of the control device vendor specifications must be maintained until removal.

(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 62.16714(b):

(i) The maximum expected gas generation flow rate as calculated in § 62.16720(a)(1). The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the Administrator.

(ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in § 62.16728(a)(1).

(2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 62.16714(c) through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts:

(i) The average temperature measured at least every 15 minutes and averaged over the same time period of the performance test.

(ii) The percent reduction of NMOC determined as specified in § 62.16714(c)(2) achieved by the control device.

(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 62.16714(c)(2)(i) through use of a boiler or process heater of any size: A description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing.

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 62.16714(c)(1) through use of a non-enclosed flare, the flare type (*i.e.*, steam-assisted, air-assisted, or non-assisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in 40 CFR 60.18 of this chapter; and continuous records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame or the flare flame is absent.

(5) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with § 62.16714(c)(3) through use of a landfill gas treatment system:

(i) ***Bypass records.*** Records of the flow of landfill gas to, and bypass of, the treatment system.

(ii) ***Site-specific treatment monitoring plan.*** A site-specific treatment monitoring plan, to include:

(A) Monitoring records of parameters that are identified in the treatment system monitoring plan and that ensure the treatment system is operating properly for each intended end use of the treated landfill gas. At a minimum, records should include records of filtration, de-watering, and compression parameters that ensure the treatment system is operating properly for each intended end use of the treated landfill gas.

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

(C) Documentation of the monitoring methods and ranges, along with justification for their use.

(D) Identify who is responsible (by job title) for data collection.

(E) Processes and methods used to collect the necessary data.

(F) Description of the procedures and methods that are used for quality assurance, maintenance, and repair of all continuous monitoring systems.

(c) Except as provided in § 62.16724(d)(2), each owner or operator of a controlled landfill subject to the provisions of this subpart must keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in § 62.16722 as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.

(1) The following constitute exceedances that must be recorded and reported under § 62.16724:

(i) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal unit per hour) or greater, all 3-hour periods of operation during which the average temperature was more than 28 degrees Celsius (82 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with § 62.16714(c) was determined.

(ii) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under paragraph (b)(3) of this section.

(2) Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible continuous records of the indication of flow to the control system and the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under § 62.16722.

(3) Each owner or operator subject to the provisions of this subpart who uses a boiler or process heater with a design heat input capacity of 44 megawatts or greater to comply with § 62.16714(c) must keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other state, local, tribal, or Federal regulatory requirements.

(4) Each owner or operator seeking to comply with the provisions of this subpart by use of a non-enclosed flare must keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under § 62.16722(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

(5) Each owner or operator of a landfill seeking to comply with § 62.16714(e) using an active collection system designed in accordance with § 62.16714(b) must keep records of periods when the collection system or control device is not operating.

(d) Except as provided in § 62.16724(d)(2), each owner or operator subject to the provisions of this subpart must keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label on each collector that matches the labeling on the plot map.

(1) Each owner or operator subject to the provisions of this subpart must keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under § 62.16720(b).

(2) Each owner or operator subject to the provisions of this subpart must keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in § 62.16728(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in § 62.16728(a)(3)(ii).

(e) Except as provided in § 62.16724(d)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of the items in paragraphs (e)(1) through (5) of this section. Each owner or operator that chooses to comply with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed in §§ 62.16716, 62.16720, and 62.16722, must keep the records in paragraph (e)(6) of this section and must keep records according to § 63.1983(e)(1) through (5) of this chapter in lieu of paragraphs (e)(1) through (5) of this section.

(1) All collection and control system exceedances of the operational standards in § 62.16716, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

(2) Each owner or operator subject to the provisions of this subpart must also keep records of each wellhead temperature monitoring value of 55 degrees Celsius (131 degrees Fahrenheit) or above, each wellhead nitrogen level at or above 20 percent, and each wellhead oxygen level at or above 5 percent.

(3) For any root cause analysis for which corrective actions are required in § 62.16720(a)(3) or § 62.16720(a)(4), keep a record of the root cause analysis conducted, including a description of the recommended corrective action(s) taken, and the date(s) the corrective action(s) were completed.

(4) For any root cause analysis for which corrective actions are required in § 62.16720(a)(3)(ii) or § 62.16720(a)(4)(ii), keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, and, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates.

(5) For any root cause analysis for which corrective actions are required in § 62.16720(a)(3)(iii) or § 62.16720(a)(4)(iii), keep a record of the root cause analysis conducted, the corrective action analysis, the date for corrective action(s) already completed following the positive pressure reading or high temperature reading, for action(s) not already completed, a schedule for implementation, including proposed commencement and completion dates, and a copy of any comments or final approval on the corrective action analysis or schedule from the regulatory agency.

(6) Each owner or operator that chooses to comply with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter, as allowed in §§ 62.16716, 62.16720, and 62.16722, must keep records of the date upon which the owner or operator started complying with the provisions in §§ 63.1958, 63.1960, and 63.1961 of this chapter.

(f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, as provided in the definition of "design capacity," must keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(g) Landfill owners or operators seeking to demonstrate that site-specific surface methane emissions are below 500 parts-per-million by conducting SEM under the Tier 4 procedures specified in § 62.16718(a)(6) must keep for at least 5 years up-to-date, readily accessible records of all SEM and information related to monitoring instrument calibrations conducted according to sections 8 and 10 of EPA Method 21 of appendix A-7 of 40 CFR part 60 of this chapter, including all of the following items:

(1) Calibration records.

(i) Date of calibration and initials of operator performing the calibration.

(ii) Calibration gas cylinder identification, certification date, and certified concentration.

(iii) Instrument scale(s) used.

(iv) A description of any corrective action taken if the meter readout could not be adjusted to correspond to the calibration gas value.

(v) If an owner or operator makes their own calibration gas, a description of the procedure used.

(2) Digital photographs of the instrument setup. The photographs must be time and date-stamped and taken at the first sampling location prior to sampling and at the last sampling location after sampling at the end of each sampling day, for the duration of the Tier 4 monitoring demonstration.

(3) Timestamp of each surface scan reading.

(i) Timestamp should be detailed to the nearest second, based on when the sample collection begins.

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

(4) Location of each surface scan reading. The owner or operator must determine the coordinates using an instrument with an accuracy of at least 4 meters. Coordinates must be in decimal degrees with at least five decimal places.

(5) Monitored methane concentration (parts per million) of each reading.

(6) Background methane concentration (parts per million) after each instrument calibration test.

(7) Adjusted methane concentration using most recent calibration (parts-per-million).

(8) For readings taken at each surface penetration, the unique identification location label matching the label specified in paragraph (d) of this section.

(9) Records of the operating hours of the gas collection system for each destruction device.

(h) Except as provided in § 62.16724(d)(2), each owner or operator subject to the provisions of this subpart must keep for at least 5 years up-to-date, readily accessible records of all collection and control system monitoring data for parameters measured in § 62.16722(a)(1), (2), and (3).

(i) Any records required to be maintained by this subpart that are submitted electronically via the EPA's CDX may be maintained in electronic format.

(j) For each owner or operator reporting leachate or other liquids addition under § 62.16724(l), keep records of any engineering calculations or company records used to estimate the quantities of leachate or liquids added, the surface areas for which the leachate or liquids were applied, and the estimates of annual waste acceptance or total waste in place in the areas where leachate or liquids were applied.

§ 62.16728 Specifications for active collection systems.

Follow the specifications for active collection systems in this section.

(a) Each owner or operator seeking to comply with § 62.16714(b) must site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the Administrator.

(1) The collection devices within the interior must be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues must be addressed in the design: Depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, resistance to the refuse decomposition heat, and ability to isolate individual components or sections for repair or troubleshooting without shutting down entire collection system.

(2) The sufficient density of gas collection devices determined in paragraph (a)(1) of this section must address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.

(3) The placement of gas collection devices determined in paragraph (a)(1) of this section must control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (ii) of this section.

(i) Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under § 62.16726(d). The documentation must provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and must be provided to the Administrator upon request.

(ii) Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material must be documented and provided to the Administrator upon request. A separate NMOC emissions estimate must be made for each section proposed for exclusion, and the sum of all such sections must be compared to the NMOC emissions estimate for the entire landfill.

(A) The NMOC emissions from each section proposed for exclusion must be computed using Equation 7:

$$Q_i = 2kL_oM_i(e^{-kt_i})(C_{NMOC})(3.6\times10^{-9}) \quad \text{(Eq. 7)}$$

Where:

Q_i = NMOC emission rate from the ith section, megagrams per year.

k = Methane generation rate constant, $year^{-1}$.

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

M_i = Mass of the degradable solid waste in the ith section, megagram.

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

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

3.6×10^{-9} = Conversion factor.

(B) If the owner or operator is proposing to exclude, or cease gas collection and control from, nonproductive physically separated (*e.g.*, separately lined) closed areas that already have gas collection systems, NMOC emissions from each physically separated closed

area must be computed using either Equation 3 in § 62.16718 or Equation 7 in paragraph (a)(3)(ii)(A) of this section.

(iii) The values for k and C_{NMOC} determined in field testing must be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (the distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k, Lo, and C_{NMOC} provided in § 62.16718 or the alternative values from § 62.16718 must be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in paragraph (a)(3)(i) of this section.

(b) Each owner or operator seeking to comply with § 62.16714(b) must construct the gas collection devices using the following equipment or procedures:

(1) The landfill gas extraction components must be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: Convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system must extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors must be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations must be situated with regard to the need to prevent excessive air infiltration.

(2) Vertical wells must be placed so as not to endanger underlying liners and must address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors must be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices must be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.

(3) Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly must include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices must be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

(c) Each owner or operator seeking to comply with § 62.16714(c) must convey the landfill gas to a control system in compliance with § 62.16714(c) through the collection header pipe(s). The gas mover equipment must be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

(1) For existing collection systems, the flow data must be used to project the maximum flow rate. If no flow data exist, the procedures in paragraph (c)(2) of this section must be used.

(2) For new collection systems, the maximum flow rate must be in accordance with § 62.16720(a)(1).

§ 62.16730 Definitions.

Terms used but not defined in this subpart have the meaning given them in the Clean Air Act and in subparts A and B of 40 CFR part 60 of this chapter.

Achieve final compliance means to connect and operate the collection and control system as specified in the final control plan. Within 180 days after the date the landfill is required to achieve final compliance, the initial performance test must be conducted.

Active collection system means a gas collection system that uses gas mover equipment.

Active landfill means a landfill in which solid waste is being placed or a landfill that is planned to accept waste in the future.

Administrator means the Administrator of the U.S. Environmental Protection Agency or his/her authorized representative or the Administrator of a state air pollution control agency.

Award contract means the MSW landfill owner or operator enters into legally binding agreements or contractual obligations that cannot be canceled or modified without substantial financial loss to the MSW landfill owner or operator. The MSW landfill owner or operator may award a number of contracts to install the collection and control system. To meet this increment of progress, the MSW landfill owner or operator must award a contract or contracts to initiate on-site construction or installation of the collection and control system.

Closed landfill means a landfill in which solid waste is no longer being placed, and in which no additional solid wastes will be placed without first filing a notification of modification as prescribed under 40 CFR 60.7(a)(4) of this chapter. Once a notification of modification has been filed, and additional solid waste is placed in the landfill, the landfill is no longer closed.

Closed area means a separately lined area of an MSW landfill in which solid waste is no longer being placed. If additional solid waste is placed in that area of the landfill, that landfill area is no longer closed. The area must be separately lined to ensure that the landfill gas does not migrate between open and closed areas.

Closed landfill subcategory means a closed landfill that has submitted a closure report as specified in § 62.16724(f) on or before September 27, 2017.

Closure means that point in time when a landfill becomes a closed landfill.

Commercial solid waste means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

Complete on-site construction means that all necessary collection system components and air pollution control devices identified in the final control plan are on site, in place, and ready for operation.

Controlled landfill means any landfill at which collection and control systems are required under this subpart as a result of the NMOC emission rate. The landfill is considered controlled at the time a collection and control system design plan is prepared in compliance with § 62.16714(e)(2). Controlled landfills also includes those landfills that meet the definition of *legacy controlled landfills,* as defined in this subpart.

Corrective action analysis means a description of all reasonable interim and long-term measures, if any, that are available, and an explanation of why the selected corrective action(s) is/are the best alternative(s), including, but not limited to, considerations of cost effectiveness, technical feasibility, safety, and secondary impacts.

Design capacity means the maximum amount of solid waste a landfill can accept, as indicated in terms of volume or mass in the most recent permit issued by the state, local, or tribal agency responsible for regulating the landfill, plus any in-place waste not accounted for in the most recent permit. If the owner or operator chooses to convert the design capacity from volume to mass or from mass to volume to demonstrate its design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, the calculation must include a site-specific density, which must be recalculated annually.

Disposal facility means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

Emission rate cutoff means the threshold annual emission rate to which a landfill compares its estimated emission rate to determine if control under the regulation is required.

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 is considered an enclosed combustor.

EPA approved state plan means a state plan that EPA has approved based on the requirements in 40 CFR part 60, subpart B or Ba to implement and enforce 40 CFR part 60, subpart Cf. An approved state plan becomes effective on the date specified in the document published in the Federal Register announcing EPA's approval.

Flare means an open combustor without enclosure or shroud.

Final control plan (Collection and control system design plan) means a plan that describes the collection and control system that will capture the gas generated within an MSW landfill. The collection and control system design plan must be prepared by a professional engineer and must

describe a collection and control system that meets the requirements of § 62.1614(b) and (c). The final control plan must contain engineering specifications and drawings of the collection and control system. The final control plan must include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping, or reporting provisions of §§ 62.16716 through 62.16726 proposed by the owner or operator. The final control plan must either conform with the specifications for active collection systems in § 62.16728 or include a demonstration that shows that based on the size of the landfill and the amount of waste expected to be accepted, the system is sized properly to collect the gas, control emissions of NMOC to the required level and meet the operational standards for a landfill.

Gas mover equipment means the equipment (*i.e.*, fan, blower, compressor) used to transport landfill gas through the header system.

Gust means the highest instantaneous wind speed that occurs over a 3-second running average.

Indian Country means all land within the limits of any Indian reservation under the jurisdiction of the United States government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation; all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state; and all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

Initiate on-site construction means to begin any of the following: Installation of the collection and control system to be used to comply with the emission limits as outlined in the final control plan; physical preparation necessary for the installation of the collection and control system to be used to comply with the final emission limits as outlined in the final control plan; or, alteration of an existing collection and control system to be used to comply with the final emission limits as outlined in the final control plan.

Household waste means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including, but not limited to, single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas). Household waste does not include fully segregated yard waste. Segregated yard waste means vegetative matter resulting exclusively from the cutting of grass, the pruning and/or removal of bushes, shrubs, and trees, the weeding of gardens, and other landscaping maintenance activities. Household waste does not include construction, renovation, or demolition wastes, even if originating from a household.

Industrial solid waste means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under Subtitle C of the RCRA, parts 264 and 265 of this chapter. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: Electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone,

glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.

Interior well means any well or similar collection component located inside the perimeter of the landfill waste. A perimeter well located outside the landfilled waste is not an interior well.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile as those terms are defined under § 257.2 of this title.

Lateral expansion means a horizontal expansion of the waste boundaries of an existing MSW landfill. A lateral expansion is not a modification unless it results in an increase in the design capacity of the landfill.

Leachate recirculation means the practice of taking the leachate collected from the landfill and reapplying it to the landfill by any of one of a variety of methods, including pre-wetting of the waste, direct discharge into the working face, spraying, infiltration ponds, vertical injection wells, horizontal gravity distribution systems, and pressure distribution systems.

Legacy controlled landfill means any MSW landfill subject to this subpart that submitted a collection and control system design plan prior to May 21, 2021 in compliance with § 60.752(b)(2)(i) of this chapter, the Federal plan at subpart GGG of this part, or a state/tribal plan implementing 40 CFR part 60, subpart Cc of this chapter, depending on which regulation was applicable to the landfill. This definition applies to those landfills that completed construction and began operations of the GCCS and those that are within the 30-month timeline for installation and start-up of a GCCS according to § 60.752(b)(2)(ii) of this chapter, the Federal plan at subpart GGG of this part, or a state/tribal plan implementing 40 CFR part 60, subpart Cc.

Modification means an increase in the permitted volume design capacity of the landfill by either lateral or vertical expansion based on its permitted design capacity as of July 17, 2014. Modification does not occur until the owner or operator commences construction on the lateral or vertical expansion.

Municipal solid waste landfill **or** ***MSW landfill*** means an entire disposal facility in a contiguous geographical space where household waste is placed in or on land. An MSW landfill may also receive other types of RCRA, Subtitle D wastes (§ 257.2 of this title) such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, and industrial solid waste. Portions of an MSW landfill may be separated by access roads. An MSW landfill may be publicly or privately owned. An MSW landfill may be a new MSW landfill, an existing MSW landfill, or a lateral expansion.

Municipal solid waste landfill emissions **or** ***MSW landfill emissions*** means gas generated by the decomposition of organic waste deposited in an MSW landfill or derived from the evolution of organic compounds in the waste.

NMOC means nonmethane organic compounds, as measured according to the provisions of § 62.16718.

Negative declaration letter means a letter to EPA declaring that there are no existing MSW landfills in the state or that there are no existing MSW landfills in the state that must install collection and control systems according to the requirements of 40 CFR part 60, subpart Cf.

Nondegradable waste means any waste that does not decompose through chemical breakdown or microbiological activity. Examples are, but are not limited to, concrete, municipal waste combustor ash, and metals.

Passive collection system means a gas collection system that solely uses positive pressure within the landfill to move the gas rather than using gas mover equipment.

Protectorate means American Samoa, the Commonwealth of Puerto Rico, the District of Columbia, Guam, the Northern Mariana Islands, and the Virgin Islands.

Root cause analysis means an assessment conducted through a process of investigation to determine the primary cause, and any other contributing causes, of positive pressure at a wellhead.

Sludge means the term sludge as defined in 40 CFR 258.2.

Solid waste means the term solid waste as defined in 40 CFR 258.2.

State means any of the 50 United States and the protectorates of the United States.

State plan means a plan submitted pursuant to section 111(d) of the Clean Air Act and subpart B of part 60 of this chapter that implements and enforces subpart Cf of 40 CFR part 60 of this chapter.

Sufficient density means any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors, and surface collectors necessary to maintain emission and migration control as determined by measures of performance set forth in this part.

Sufficient extraction rate means a rate sufficient to maintain a negative pressure at all wellheads in the collection system without causing air infiltration, including any wellheads connected to the system as a result of expansion or excess surface emissions, for the life of the blower.

Treated landfill gas means landfill gas processed in a treatment system as defined in this subpart.

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

Tribal plan means a plan submitted by a Tribal Authority pursuant to 40 CFR parts 9, 35, 49, 50, and 81 that implements and enforces 40 CFR part 60, subpart Cf.

Untreated landfill gas means any landfill gas that is not treated landfill gas.

Table 1 to Subpart OOO of Part 62 - Generic Compliance Schedule and Increments of Progress

Increment	Date if using tiers 1, 2, or 3	Date if using tier 4	Date if a legacy controlled landfill
Increment 1 - Submit cover page of final control plan	1 year after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥34 megagrams per year.[1]	1 year after the first measured concentration of methane of 500 parts per million or greater from the surface of the landfill	1 year after the first NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥50 megagrams per year submitted under a previous regulation.[2]
Increment 2 - Award Contracts	20 months after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥34 megagrams per year.[1]	20 months after the most recent NMOC emission rate report showing NMOC emissions ≥34 megagrams per year	20 months after the most recent NMOC emission rate report showing NMOC emissions ≥50 megagrams per year submitted under a previous regulation.[2]
Increment 3 - Begin on-site construction	24 months after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥34 megagrams per year.[1]	24 months after the most recent NMOC emission rate report showing NMOC emissions ≥34 megagrams per year	24 months after the most recent NMOC emission rate report showing NMOC emissions ≥50 megagrams per year submitted under a previous regulation.[2]
Increment 4 - Complete on-site construction	30 months after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥34 megagrams per year.[1]	30 months after the most recent NMOC emission rate report showing NMOC emissions ≥34 megagrams per year	30 months after the first NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥50 megagrams submitted under a previous regulation.
Increment 5 - Final compliance	30 months after initial NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥34 megagrams per year.[1]	30 months after the most recent NMOC emission rate report showing NMOC emissions ≥34 megagrams per year	30 months after the first NMOC emission rate report or the first annual emission rate report showing NMOC emissions ≥50 megagrams submitted under a previous regulation.[2]

[1] 50 megagrams per year NMOC for the closed landfill subcategory.

[2] Previous regulation refers to 40 CFR part 60, subpart WWW; 40 CFR part 62, subpart GGG; or a state plan implementing 40 CFR part 60, subpart Cc. Increments of progress that have already been completed under previous regulations do not have to be completed again under this subpart.

§ 60.18 General control device and work practice requirements.

(a) ***Introduction.***

(1) This section contains requirements for control devices used to comply with applicable subparts of 40 CFR parts 60 and 61. The requirements are placed here for administrative convenience and apply only to facilities covered by subparts referring to this section.

(2) This section also contains requirements for an alternative work practice used to identify leaking equipment. This alternative work practice is placed here for administrative convenience and is available to all subparts in 40 CFR parts 60, 61, 63, and 65 that require monitoring of equipment with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(b) ***Flares.*** Paragraphs (c) through (f) apply to flares.

(c)

(1) Flares shall be designed for and operated with no visible emissions as determined by the methods specified in paragraph (f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

(2) Flares shall be operated with a flame present at all times, as determined by the methods specified in paragraph (f).

(3) An owner/operator has the choice of adhering to either the heat content specifications in paragraph (c)(3)(ii) of this section and the maximum tip velocity specifications in paragraph (c)(4) of this section, or adhering to the requirements in paragraph (c)(3)(i) of this section.

(i)

(A) Flares shall be used that have a diameter of 3 inches or greater, are nonassisted, 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 m/sec (122 ft/sec) and less than the velocity, V_{max}, as determined by the following equation:

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

Where:

V_{max} = Maximum permitted velocity, m/sec.

K_1 = Constant, 6.0 volume-percent hydrogen.

K_2 = Constant, 3.9(m/sec)/volume-percent hydrogen.

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. (Incorporated by reference as specified in § 60.17).

(B) The actual exit velocity of a flare shall be determined by the method specified in paragraph (f)(4) of this section.

(ii) Flares shall be used only with the net heating value of the gas being combusted being 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or with the net heating value of the gas being combusted being 7.45 MJ/scm (200 Btu/scf) or greater if the flare is nonassisted. The net heating value of the gas being combusted shall be determined by the methods specified in paragraph (f)(3) of this section.

(4)

(i) Steam-assisted and nonassisted flares shall be designed for and operated with an exit velocity, as determined by the methods specified in paragraph (f)(4) of this section, less than 18.3 m/sec (60 ft/sec), except as provided in paragraphs (c)(4) (ii) and (iii) of this section.

(ii) Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the methods specified in paragraph (f)(4), equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec) are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

(iii) Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the methods specified in paragraph (f)(4), less than the velocity, V_{max}, as determined by the method specified in paragraph (f)(5), and less than 122 m/sec (400 ft/sec) are allowed.

(5) Air-assisted flares shall be designed and operated with an exit velocity less than the velocity, V_{max}, as determined by the method specified in paragraph (f)(6).

(6) Flares used to comply with this section shall be steam-assisted, air-assisted, or nonassisted.

(d) Owners or operators of flares used to comply with the provisions of this subpart shall monitor these control devices to ensure that they are operated and maintained in conformance with their designs. Applicable subparts will provide provisions stating how owners or operators of flares shall monitor these control devices.

(e) Flares used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.

(f)

(1) Method 22 of appendix A to this part shall be used to determine the compliance of flares with the visible emission provisions of this subpart. The observation period is 2 hours and shall be used according to Method 22.

(2) The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame.

(3) The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

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

where:

H_T = Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C;

$$K = \text{Constant}, 1.740 \times 10^{-7} \left(\frac{1}{ppm}\right) \left(\frac{g\ mole}{scm}\right) \left(\frac{MJ}{kcal}\right)$$

where the standard temperature for $\left(\frac{g\ mole}{scm}\right)$ i

C_i = Concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 and measured for hydrogen and carbon monoxide by ASTM D1946-77 or 90 (Reapproved 1994) (Incorporated by reference as specified in § 60.17); and

H_i = Net heat of combustion of sample component i, kcal/g mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382-76 or 88 or D4809-95 (incorporated by reference as specified in § 60.17) if published values are not available or cannot be calculated.

(4) The actual exit velocity of a flare shall be determined by dividing the volumetric flowrate (in units of standard temperature and pressure), as determined by Reference Methods 2, 2A, 2C, or 2D as appropriate; by the unobstructed (free) cross sectional area of the flare tip.

(5) The maximum permitted velocity, V_{max}, for flares complying with paragraph (c)(4)(iii) shall be determined by the following equation.

$$Log_{10} (V_{max}) = (H_T + 28.8)/31.7$$

V_{max} = Maximum permitted velocity, M/sec

28.8 = Constant

31.7 = Constant

H_T = The net heating value as determined in paragraph (f)(3).

(6) The maximum permitted velocity, V_{max}, for air-assisted flares shall be determined by the following equation.

$$V_{max} = 8.706 + 0.7084 (H_T)$$

V_{max} = Maximum permitted velocity, m/sec

8.706 = Constant

0.7084 = Constant

H_T = The net heating value as determined in paragraph (f)(3).

(g) ***Alternative work practice for monitoring equipment for leaks.*** Paragraphs (g), (h), and (i) of this section apply to all equipment for which the applicable subpart requires monitoring with a 40 CFR part 60, appendix A-7, Method 21 monitor, except for closed vent systems, equipment designated as leakless, and equipment identified in the applicable subpart as having no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background. An owner or operator may use an optical gas imaging instrument instead of a 40 CFR part 60, appendix A-7, Method 21 monitor. Requirements in the existing subparts that are specific to the Method 21 instrument do not apply under this section. All other requirements in the applicable subpart that are not addressed in paragraphs (g), (h), and (i) of this section apply to this standard. For example, equipment specification requirements, and non-Method 21 instrument recordkeeping and reporting requirements in the applicable subpart continue to apply. The terms defined in paragraphs (g)(1) through (5) of this section have meanings that are specific to the alternative work practice standard in paragraphs (g), (h), and (i) of this section.

(1) ***Applicable subpart*** means the subpart in 40 CFR parts 60, 61, 63, or 65 that requires monitoring of equipment with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(2) ***Equipment*** means pumps, valves, pressure relief valves, compressors, open-ended lines, flanges, connectors, and other equipment covered by the applicable subpart that require monitoring with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(3) ***Imaging*** means making visible emissions that may otherwise be invisible to the naked eye.

(4) ***Optical gas imaging instrument*** means an instrument that makes visible emissions that may otherwise be invisible to the naked eye.

(5) ***Repair*** means that equipment is adjusted, or otherwise altered, in order to eliminate a leak.

(6) ***Leak*** means:

(i) Any emissions imaged by the optical gas instrument;

(ii) Indications of liquids dripping;

(iii) Indications by a sensor that a seal or barrier fluid system has failed; or

(iv) Screening results using a 40 CFR part 60, appendix A-7, Method 21 monitor that exceed the leak definition in the applicable subpart to which the equipment is subject.

(h) The alternative work practice standard for monitoring equipment for leaks is available to all subparts in 40 CFR parts 60, 61, 63, and 65 that require monitoring of equipment with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(1) An owner or operator of an affected source subject to CFR parts 60, 61, 63, or 65 can choose to comply with the alternative work practice requirements in paragraph (i) of this section instead of using the 40 CFR part 60, appendix A-7, Method 21 monitor to identify leaking equipment. The owner or operator must document the equipment, process units, and facilities for which the alternative work practice will be used to identify leaks.

(2) Any leak detected when following the leak survey procedure in paragraph (i)(3) of this section must be identified for repair as required in the applicable subpart.

(3) If the alternative work practice is used to identify leaks, re-screening after an attempted repair of leaking equipment must be conducted using either the alternative work practice or the 40 CFR part 60, appendix A-7, Method 21 monitor at the leak definition required in the applicable subpart to which the equipment is subject.

(4) The schedule for repair is as required in the applicable subpart.

(5) When this alternative work practice is used for detecting leaking equipment, choose one of the monitoring frequencies listed in Table 1 to subpart A of this part in lieu of the monitoring frequency specified for regulated equipment in the applicable subpart. Reduced monitoring frequencies for good performance are not applicable when using the alternative work practice.

(6) When this alternative work practice is used for detecting leaking equipment the following are not applicable for the equipment being monitored:

(i) Skip period leak detection and repair;

(ii) Quality improvement plans; or

(iii) Complying with standards for allowable percentage of valves and pumps to leak.

(7) When the alternative work practice is used to detect leaking equipment, the regulated equipment in paragraph (h)(1)(i) of this section must also be monitored annually using a 40 CFR part 60, appendix A-7, Method 21 monitor at the leak definition required in the applicable subpart. The owner or operator may choose the specific monitoring period (for example, first quarter) to conduct the annual monitoring. Subsequent monitoring must be conducted every 12 months from the initial period. Owners or operators must keep records of the annual Method 21 screening results, as specified in paragraph (i)(4)(vii) of this section.

(i) An owner or operator of an affected source who chooses to use the alternative work practice must comply with the requirements of paragraphs (i)(1) through (i)(5) of this section.

(1) Instrument Specifications. The optical gas imaging instrument must comply with the requirements in (i)(1)(i) and (i)(1)(ii) of this section.

(i) Provide the operator with an image of the potential leak points for each piece of equipment at both the detection sensitivity level and within the distance used in the daily instrument check described in paragraph (i)(2) of this section. The detection sensitivity level depends upon the frequency at which leak monitoring is to be performed.

(ii) Provide a date and time stamp for video records of every monitoring event.

(2) Daily Instrument Check. On a daily basis, and prior to beginning any leak monitoring work, test the optical gas imaging instrument at the mass flow rate determined in paragraph (i)(2)(i) of this section in accordance with the procedure specified in paragraphs (i)(2)(ii) through (i)(2)(iv) of this section for each camera configuration used during monitoring (for example, different lenses used), unless an alternative method to demonstrate daily instrument checks has been approved in accordance with paragraph (i)(2)(v) of this section.

(i) Calculate the mass flow rate to be used in the daily instrument check by following the procedures in paragraphs (i)(2)(i)(A) and (i)(2)(i)(B) of this section.

(A) For a specified population of equipment to be imaged by the instrument, determine the piece of equipment in contact with the lowest mass fraction of chemicals that are detectable, within the distance to be used in paragraph (i)(2)(iv)(B) of this section, at or below the standard detection sensitivity level.

(B) Multiply the standard detection sensitivity level, corresponding to the selected monitoring frequency in Table 1 of subpart A of this part, by the mass fraction of detectable chemicals from the stream identified in paragraph (i)(2)(i)(A) of this section to determine the mass flow rate to be used in the daily instrument check, using the following equation.

$$E_{dic} = (E_{sds}) \sum_{i=1}^{k} x_i$$

Where:

E_{dic} = Mass flow rate for the daily instrument check, grams per hour

x_i = Mass fraction of detectable chemical(s) i seen by the optical gas imaging instrument, within the distance to be used in paragraph (i)(2)(iv)(B) of this section, at or below the standard detection sensitivity level, E_{sds}.

E_{sds} = Standard detection sensitivity level from Table 1 to subpart A, grams per hour

k = Total number of detectable chemicals emitted from the leaking equipment and seen by the optical gas imaging instrument.

(ii) Start the optical gas imaging instrument according to the manufacturer's instructions, ensuring that all appropriate settings conform to the manufacturer's instructions.

(iii) Use any gas chosen by the user that can be viewed by the optical gas imaging instrument and that has a purity of no less than 98 percent.

(iv) Establish a mass flow rate by using the following procedures:

(A) Provide a source of gas where it will be in the field of view of the optical gas imaging instrument.

(B) Set up the optical gas imaging instrument at a recorded distance from the outlet or leak orifice of the flow meter that will not be exceeded in the actual performance of the leak survey. Do not exceed the operating parameters of the flow meter.

(C) Open the valve on the flow meter to set a flow rate that will create a mass emission rate equal to the mass rate specified in paragraph (i)(2)(i) of this section while observing the gas flow through the optical gas imaging instrument viewfinder. When an image of

the gas emission is seen through the viewfinder at the required emission rate, make a record of the reading on the flow meter.

(v) Repeat the procedures specified in paragraphs (i)(2)(ii) through (i)(2)(iv) of this section for each configuration of the optical gas imaging instrument used during the leak survey.

(vi) To use an alternative method to demonstrate daily instrument checks, apply to the Administrator for approval of the alternative under § 60.13(i).

(3) Leak Survey Procedure. Operate the optical gas imaging instrument to image every regulated piece of equipment selected for this work practice in accordance with the instrument manufacturer's operating parameters. All emissions imaged by the optical gas imaging instrument are considered to be leaks and are subject to repair. All emissions visible to the naked eye are also considered to be leaks and are subject to repair.

(4) Recordkeeping. You must keep the records described in paragraphs (i)(4)(i) through (i)(4)(vii) of this section:

(i) The equipment, processes, and facilities for which the owner or operator chooses to use the alternative work practice.

(ii) The detection sensitivity level selected from Table 1 to subpart A of this part for the optical gas imaging instrument.

(iii) The analysis to determine the piece of equipment in contact with the lowest mass fraction of chemicals that are detectable, as specified in paragraph (i)(2)(i)(A) of this section.

(iv) The technical basis for the mass fraction of detectable chemicals used in the equation in paragraph (i)(2)(i)(B) of this section.

(v) The daily instrument check. Record the distance, per paragraph (i)(2)(iv)(B) of this section, and the flow meter reading, per paragraph (i)(2)(iv)(C) of this section, at which the leak was imaged. Keep a video record of the daily instrument check for each configuration of the optical gas imaging instrument used during the leak survey (for example, the daily instrument check must be conducted for each lens used). The video record must include a time and date stamp for each daily instrument check. The video record must be kept for 5 years.

(vi) Recordkeeping requirements in the applicable subpart. A video record must be used to document the leak survey results. The video record must include a time and date stamp for each monitoring event. A video record can be used to meet the recordkeeping requirements of the applicable subparts if each piece of regulated equipment selected for this work practice can be identified in the video record. The video record must be kept for 5 years.

(vii) The results of the annual Method 21 screening required in paragraph (h)(7) of this section. Records must be kept for all regulated equipment specified in paragraph (h)(1) of this section. Records must identify the equipment screened, the screening value measured by Method 21, the time and date of the screening, and calibration information required in the existing applicable subpart.

(5) Reporting. Submit the reports required in the applicable subpart. Submit the records of the annual Method 21 screening required in paragraph (h)(7) of this section to the Administrator via e-mail to *CCG-AWP@EPA.GOV*.

[51 FR 2701, Jan. 21, 1986, as amended at 63 FR 24444, May 4, 1998; 65 FR 61752, Oct. 17, 2000; 73 FR 78209, Dec. 22, 2008]

§ 63.11 Control device and work practice requirements.

(a) ***Applicability.***

(1) The applicability of this section is set out in § 63.1(a)(4).

(2) This section contains requirements for control devices used to comply with applicable subparts of this part. The requirements are placed here for administrative convenience and apply only to facilities covered by subparts referring to this section.

(3) This section also contains requirements for an alternative work practice used to identify leaking equipment. This alternative work practice is placed here for administrative convenience and is available to all subparts in 40 CFR parts 60, 61, 63, and 65 that require monitoring of equipment with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(b) ***Flares.***

(1) Owners or operators using flares to comply with the provisions of this part shall monitor these control devices to assure that they are operated and maintained in conformance with their designs. Applicable subparts will provide provisions stating how owners or operators using flares shall monitor these control devices.

(2) Flares shall be steam-assisted, air-assisted, or non-assisted.

(3) Flares shall be operated at all times when emissions may be vented to them.

(4) Flares shall be designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. Test Method 22 in appendix A of part 60 of this chapter shall be used to determine the compliance of flares with the visible emission provisions of this part. The observation period is 2 hours and shall be used according to Method 22.

(5) Flares shall be operated with a flame present at all times. The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame.

(6) An owner/operator has the choice of adhering to the heat content specifications in paragraph (b)(6)(ii) of this section, and the maximum tip velocity specifications in paragraph (b)(7) or (b)(8) of this section, or adhering to the requirements in paragraph (b)(6)(i) of this section.

(i)

(A) Flares shall be used that have a diameter of 3 inches or greater, are nonassisted, 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 m/sec (122 ft/sec) and less than the velocity V_{max}, as determined by the following equation:

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

Where:

V_{max} = Maximum permitted velocity, m/sec.

K_1 = Constant, 6.0 volume-percent hydrogen.

K_2 = Constant, 3.9(m/sec)/volume-percent hydrogen.

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. (Incorporated by reference as specified in § 63.14).

(B) The actual exit velocity of a flare shall be determined by the method specified in paragraph (b)(7)(i) of this section.

(ii) Flares shall be used only with the net heating value of the gas being combusted at 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or with the net heating value of the gas being combusted at 7.45 M/scm (200 Btu/scf) or greater if the flares is non-assisted. The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

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

Where:

H_T = Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C.

K = Constant =

$$1.740 \times 10^{-7} \left(\frac{1}{\text{ppmv}} \right) \left(\frac{\text{g-mole}}{\text{scm}} \right) \left(\frac{\text{MJ}}{\text{kcal}} \right)$$

where the standard temperature for (g-mole/scm) is 20 °C.

C_i = Concentration of sample component i in ppmv on a wet basis, as measured for organics by Test Method 18 and measured for hydrogen and carbon monoxide by American Society for Testing and Materials (ASTM) D1946-77 or 90 (Reapproved 1994) (incorporated by reference as specified in § 63.14).

H_i = Net heat of combustion of sample component i, kcal/g-mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382-76 or 88 or D4809-95 (incorporated by reference as specified in § 63.14) if published values are not available or cannot be calculated.

n = Number of sample components.

(7)

(i) Steam-assisted and nonassisted flares shall be designed for and operated with an exit velocity less than 18.3 m/sec (60 ft/sec), except as provided in paragraphs (b)(7)(ii) and (b)(7)(iii) of this section. The actual exit velocity of a flare shall be determined by dividing by the volumetric flow rate of gas being combusted (in units of emission standard temperature and pressure), as determined by Test Method 2, 2A, 2C, or 2D in appendix A to 40 CFR part 60 of this chapter, as appropriate, by the unobstructed (free) cross-sectional area of the flare tip.

(ii) Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in paragraph (b)(7)(i) of this section, equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec), are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

(iii) Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the method specified in paragraph (b)(7)(i) of this section, less than the velocity V_{max}, as determined by the method specified in this paragraph, but less than 122 m/sec (400 ft/sec) are allowed. The maximum permitted velocity, V_{max}, for flares complying with this paragraph shall be determined by the following equation:

$$Log_{10}(V_{max}) = (H_T + 28.8)/31.7$$

Where:

V_{max} = Maximum permitted velocity, m/sec.

28.8 = Constant.

31.7 = Constant.

H_T = The net heating value as determined in paragraph (b)(6) of this section.

(8) Air-assisted flares shall be designed and operated with an exit velocity less than the velocity V_{max}. The maximum permitted velocity, V_{max}, for air-assisted flares shall be determined by the following equation:

$V_{max} = 8.71 + 0.708(H_T)$

Where:

V_{max} = Maximum permitted velocity, m/sec.

8.71 = Constant.

0.708 = Constant.

H_T = The net heating value as determined in paragraph (b)(6)(ii) of this section.

(c) ***Alternative work practice for monitoring equipment for leaks.*** Paragraphs (c), (d), and (e) of this section apply to all equipment for which the applicable subpart requires monitoring with a 40 CFR part 60, appendix A-7, Method 21 monitor, except for closed vent systems, equipment designated as leakless, and equipment identified in the applicable subpart as having no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background. An owner or operator may use an optical gas imaging instrument instead of a 40 CFR part 60, sppendix A-7, Method 21 monitor. Requirements in the existing subparts that are specific to the Method 21 instrument do not apply under this section. All other requirements in the applicable subpart that are not addressed in paragraphs (c), (d), and (e) of this section continue to apply. For example, equipment specification requirements, and non-Method 21 instrument recordkeeping and reporting requirements in the applicable subpart continue to apply. The terms defined in paragraphs (c)(1) through (5) of this section have meanings that are specific to the alternative work practice standard in paragraphs (c), (d), and (e) of this section.

(1) ***Applicable subpart*** means the subpart in 40 CFR parts 60, 61, 63, and 65 that requires monitoring of equipment with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(2) ***Equipment*** means pumps, valves, pressure relief valves, compressors, open-ended lines, flanges, connectors, and other equipment covered by the applicable subpart that require monitoring with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(3) ***Imaging*** means making visible emissions that may otherwise be invisible to the naked eye.

(4) ***Optical gas imaging instrument*** means an instrument that makes visible emissions that may otherwise be invisible to the naked eye.

(5) ***Repair*** means that equipment is adjusted, or otherwise altered, in order to eliminate a leak.

(6) ***Leak*** means:

(i) Any emissions imaged by the optical gas instrument;

(ii) Indications of liquids dripping;

(iii) Indications by a sensor that a seal or barrier fluid system has failed; or

(iv) Screening results using a 40 CFR part 60, appendix A-7, Method 21 monitor that exceed the leak definition in the applicable subpart to which the equipment is subject.

(d) The alternative work practice standard for monitoring equipment for leaks is available to all subparts in 40 CFR parts 60, 61, 63, and 65 that require monitoring of equipment with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(1) An owner or operator of an affected source subject to 40 CFR parts 60, 61, 63, or 65 can choose to comply with the alternative work practice requirements in paragraph (e) of this section instead of using the 40 CFR part 60, appendix A-7, Method 21 monitor to identify leaking equipment. The owner or operator must document the equipment, process units, and facilities for which the alternative work practice will be used to identify leaks.

(2) Any leak detected when following the leak survey procedure in paragraph (e)(3) of this section must be identified for repair as required in the applicable subpart.

(3) If the alternative work practice is used to identify leaks, re-screening after an attempted repair of leaking equipment must be conducted using either the alternative work practice or the 40 CFR part 60, Appendix A-7, Method 21 monitor at the leak definition required in the applicable subparts to which the equipment is subject.

(4) The schedule for repair is as required in the applicable subpart.

(5) When this alternative work practice is used for detecting leaking equipment, choose one of the monitoring frequencies listed in Table 1 to subpart A of this part in lieu of the monitoring frequency specified for regulated equipment in the applicable subpart. Reduced monitoring frequencies for good performance are not applicable when using the alternative work practice.

(6) When this alternative work practice is used for detecting leaking equipment, the following are not applicable for the equipment being monitored:

(i) Skip period leak detection and repair;

(ii) Quality improvement plans; or

(iii) Complying with standards for allowable percentage of valves and pumps to leak.

(7) When the alternative work practice is used to detect leaking equipment, the regulated equipment in paragraph (d)(1)(i) of this section must also be monitored annually using a 40 CFR part 60, Appendix A-7, Method 21 monitor at the leak definition required in the applicable subpart. The owner or operator may choose the specific monitoring period (for example, first quarter) to conduct the annual monitoring. Subsequent monitoring must be conducted every 12 months from the initial period. Owners or operators must keep records of the annual Method 21 screening results, as specified in paragraph (i)(4)(vii) of this section.

(e) An owner or operator of an affected source who chooses to use the alternative work practice must comply with the requirements of paragraphs (e)(1) through (e)(5) of this section.

(1) ***Instrument specifications.*** The optical gas imaging instrument must comply with the requirements specified in paragraphs (e)(1)(i) and (e)(1)(ii) of this section.

(i) Provide the operator with an image of the potential leak points for each piece of equipment at both the detection sensitivity level and within the distance used in the daily instrument check described in paragraph (e)(2) of this section. The detection sensitivity level depends upon the frequency at which leak monitoring is to be performed.

(ii) Provide a date and time stamp for video records of every monitoring event.

(2) ***Daily instrument check.*** On a daily basis, and prior to beginning any leak monitoring work, test the optical gas imaging instrument at the mass flow rate determined in paragraph (e)(2)(i) of this section in accordance with the procedure specified in paragraphs (e)(2)(ii) through (e)(2)(iv) of this section for each camera configuration used during monitoring (for example, different lenses used), unless an alternative method to demonstrate daily instrument checks has been approved in accordance with paragraph (e)(2)(v) of this section.

(i) Calculate the mass flow rate to be used in the daily instrument check by following the procedures in paragraphs (e)(2)(i)(A) and (e)(2)(i)(B) of this section.

(A) For a specified population of equipment to be imaged by the instrument, determine the piece of equipment in contact with the lowest mass fraction of chemicals that are detectable, within the distance to be used in paragraph (e)(2)(iv)(B) of this section, at or below the standard detection sensitivity level.

(B) Multiply the standard detection sensitivity level, corresponding to the selected monitoring frequency in Table 1 of subpart A of this part, by the mass fraction of detectable chemicals from the stream identified in paragraph (e)(2)(i)(A) of this section to determine the mass flow rate to be used in the daily instrument check, using the following equation.

$$E_{dic} = (E_{sds}) \sum_{i=1}^{k} x_i$$

Where:

E_{dic} = Mass flow rate for the daily instrument check, grams per hour

x_i = Mass fraction of detectable chemical(s) i seen by the optical gas imaging instrument, within the distance to be used in paragraph (e)(2)(iv)(B) of this section, at or below the standard detection sensitivity level, E_{sds}.

E_{sds} = Standard detection sensitivity level from Table 1 to subpart A, grams per hour

k = Total number of detectable chemicals emitted from the leaking equipment and seen by the optical gas imaging instrument.

(ii) Start the optical gas imaging instrument according to the manufacturer's instructions, ensuring that all appropriate settings conform to the manufacturer's instructions.

(iii) Use any gas chosen by the user that can be viewed by the optical gas imaging instrument and that has a purity of no less than 98 percent.

(iv) Establish a mass flow rate by using the following procedures:

(A) Provide a source of gas where it will be in the field of view of the optical gas imaging instrument.

(B) Set up the optical gas imaging instrument at a recorded distance from the outlet or leak orifice of the flow meter that will not be exceeded in the actual performance of the leak survey. Do not exceed the operating parameters of the flow meter.

(C) Open the valve on the flow meter to set a flow rate that will create a mass emission rate equal to the mass rate calculated in paragraph (e)(2)(i) of this section while observing the gas flow through the optical gas imaging instrument viewfinder. When an image of the gas emission is seen through the viewfinder at the required emission rate, make a record of the reading on the flow meter.

(v) Repeat the procedures specified in paragraphs (e)(2)(ii) through (e)(2)(iv) of this section for each configuration of the optical gas imaging instrument used during the leak survey.

(vi) To use an alternative method to demonstrate daily instrument checks, apply to the Administrator for approval of the alternative under § 63.177 or § 63.178, whichever is applicable.

(3) ***Leak survey procedure.*** Operate the optical gas imaging instrument to image every regulated piece of equipment selected for this work practice in accordance with the instrument manufacturer's operating parameters. All emissions imaged by the optical gas

imaging instrument are considered to be leaks and are subject to repair. All emissions visible to the naked eye are also considered to be leaks and are subject to repair.

(4) ***Recordkeeping.*** Keep the records described in paragraphs (e)(4)(i) through (e)(4)(vii) of this section:

(i) The equipment, processes, and facilities for which the owner or operator chooses to use the alternative work practice.

(ii) The detection sensitivity level selected from Table 1 to subpart A of this part for the optical gas imaging instrument.

(iii) The analysis to determine the piece of equipment in contact with the lowest mass fraction of chemicals that are detectable, as specified in paragraph (e)(2)(i)(A) of this section.

(iv) The technical basis for the mass fraction of detectable chemicals used in the equation in paragraph (e)(2)(i)(B) of this section.

(v) The daily instrument check. Record the distance, per paragraph (e)(2)(iv)(B) of this section, and the flow meter reading, per paragraph (e)(2)(iv)(C) of this section, at which the leak was imaged. Keep a video record of the daily instrument check for each configuration of the optical gas imaging instrument used during the leak survey (for example, the daily instrument check must be conducted for each lens used). The video record must include a time and date stamp for each daily instrument check. The video record must be kept for 5 years.

(vi) ***Recordkeeping requirements in the applicable subpart.*** A video record must be used to document the leak survey results. The video record must include a time and date stamp for each monitoring event. A video record can be used to meet the recordkeeping requirements of the applicable subparts if each piece of regulated equipment selected for this work practice can be identified in the video record. The video record must be kept for 5 years.

(vii) The results of the annual Method 21 screening required in paragraph (h)(7) of this section. Records must be kept for all regulated equipment specified in paragraph (h)(1) of this section. Records must identify the equipment screened, the screening value measured by Method 21, the time and date of the screening, and calibration information required in the existing applicable subparts.

(5) ***Reporting.*** Submit the reports required in the applicable subpart. Submit the records of the annual Method 21 screening required in paragraph (h)(7) of this section to the Administrator via e-mail to *CCG-AWP@EPA.GOV*.

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